



Columbia River Crossing Study

SUMMARY MEMORANDUM

April 26, 2024 | Final Report



SUMMARY MEMORANDUM

April 26, 2024

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Table of Contents

EXECUTIVE SUMMARY	ES-1
1. BACKGROUND AND OBJECTIVES	1-1
1.1 Background.....	1-1
1.2 Study Area.....	1-1
1.3 Objectives.....	1-2
1.4 Study Process.....	1-2
1.5 Study Advisory Committee.....	1-4
1.6 Stakeholder Engagement and Public Outreach.....	1-4
2. BASELINE CONDITIONS SUMMARY	2-1
2.1 Transportation/Traffic.....	2-1
2.1.1 Current Traffic Conditions.....	2-1
2.1.2 2050 Baseline Traffic Conditions.....	2-9
2.1.3 Active Transportation.....	2-12
2.1.4 Transit.....	2-15
2.2 Structural.....	2-17
2.2.1 George Sellar (SR285) Bridge.....	2-17
2.3 Environmental.....	2-17
2.3.1 Downtown Connection Resource Considerations.....	2-17
2.3.2 SR285 Expansion Resource Considerations.....	2-24
2.3.3 Mid-Valley Connection.....	2-28
2.3.4 Malaga/Rock Island Industrial Area Crossing Resource Considerations.....	2-33
2.3.5 NEPA/SEPA and Environmental Permitting.....	2-37
2.4 Geotechnical.....	2-38
2.4.1 Local Geology.....	2-38
2.4.2 Geologic Hazards.....	2-39
2.4.3 Bridge Substructure Considerations.....	2-40
2.5 Real Property.....	2-41
2.5.1 Ownership and Land Use Considerations.....	2-41
3. CONCEPT DEVELOPMENT AND ANALYSES	3-1
3.1 Fourth Crossing Location.....	3-1
3.2 Representative Alignments.....	3-2
3.2.1 Downtown Connection.....	3-3
3.2.2 SR285 Expansion.....	3-5
3.2.3 Mid-Valley Crossing.....	3-7
3.2.4 Malaga/Rock Island Industrial Area.....	3-8

3.3	Representative Concepts	3-9
3.3.1	Downtown Connection	3-9
3.3.2	SR285 Expansion	3-10
3.3.3	Mid-Valley Crossing	3-10
3.3.4	Malaga/Rock Island Industrial Area	3-11
4.	CONCEPT EVALUATION	4-1
4.1	Downtown Connection.....	4-1
4.1.1	Transportation/Traffic Considerations.....	4-1
4.1.1.1	Traffic.....	4-1
4.1.1.2	Freight.....	4-3
4.1.1.3	Transit.....	4-3
4.1.1.4	Active Transportation	4-3
4.1.2	Structural Considerations	4-4
4.1.2.1	Bridge	4-4
4.1.2.2	Walls.....	4-4
4.1.3	Capital and Life-Cycle Costs	4-4
4.1.3.1	Capital Cost Summary.....	4-4
4.1.3.2	Life Cycle Cost Considerations	4-5
4.1.4	Environmental Considerations.....	4-6
4.1.4.1	Environmental Resources	4-6
4.1.4.2	NEPA/SEPA and Permitting	4-8
4.1.5	Property and Land Use Considerations	4-9
4.2	SR285 Expansion.....	4-10
4.2.1	Transportation/Traffic Considerations.....	4-10
4.2.1.1	Traffic.....	4-10
4.2.1.2	Freight.....	4-12
4.2.1.3	Transit.....	4-12
4.2.1.4	Active Transportation	4-12
4.2.2	Structural Considerations	4-13
4.2.2.1	Bridge	4-13
4.2.2.2	Walls.....	4-13
4.2.3	Capital and Life-Cycle Costs	4-14
4.2.3.1	Capital Cost Summary.....	4-14
4.2.3.2	Life Cycle Cost Considerations	4-14
4.2.4	Environmental Considerations.....	4-15
4.2.4.1	Environmental Resources	4-15
4.2.4.2	NEPA/SEPA and Permitting	4-17

4.2.5	Property and Land Use Considerations	4-18
4.3	Mid-Valley Crossing	4-19
4.3.1	Transportation/Traffic Considerations	4-19
4.3.1.1	Traffic	4-19
4.3.1.2	Freight	4-21
4.3.1.3	Transit	4-21
4.3.1.4	Active Transportation	4-21
4.3.2	Structural Considerations.....	4-21
4.3.2.1	Bridge.....	4-21
4.3.2.2	Walls	4-22
4.3.3	Capital and Life-Cycle Costs.....	4-22
4.3.3.1	Capital Cost Summary	4-22
4.3.3.2	Life Cycle Cost Considerations	4-23
4.3.4	Environmental Considerations	4-23
4.3.4.1	Environmental Resources	4-23
4.3.4.2	NEPA/SEPA and Permitting	4-26
4.3.5	Property and Land Use Considerations	4-27
4.4	Malaga/Rock Island Industrial Area.....	4-28
4.4.1	Transportation/Traffic Considerations	4-28
4.4.1.1	Traffic	4-28
4.4.1.2	Freight	4-30
4.4.1.3	Transit	4-30
4.4.1.4	Active Transportation	4-30
4.4.2	Structural Considerations.....	4-30
4.4.2.1	Bridge.....	4-30
4.4.2.2	Walls	4-30
4.4.3	Capital and Life-Cycle Costs.....	4-31
4.4.3.1	Capital Cost Summary	4-31
4.4.3.2	Life Cycle Cost Considerations	4-31
4.4.4	Environmental Considerations	4-32
4.4.4.1	Environmental Resources	4-32
4.4.4.2	NEPA/SEPA and Permitting	4-34
4.4.5	Property and Land Use Considerations	4-35
5.	WORKS CITED AND REFERENCES CONSULTED	5-1

List of Figures

Figure 1-1: Study Area Map	1-2
Figure 1-2: Study Process	1-3
Figure 2-1: Crash Data – No Injury.....	2-2
Figure 2-2: Crash Data – Possible Injury.....	2-3
Figure 2-3: Crash Data – Suspected Minor Injury	2-4
Figure 2-4: Crash Data – Suspected Serious Injury.....	2-5
Figure 2-5: Crash Data – Fatal Injury	2-6
Figure 2-6: 2023 Baseline – PM Volumes.....	2-7
Figure 2-7: 2023 Baseline – PM Truck Volumes.....	2-8
Figure 2-8: Annual Average Daily Traffic.....	2-9
Figure 2-9: 2050 Baseline – PM Volumes.....	2-10
Figure 2-10: 2050 Baseline – PM Truck Volumes.....	2-11
Figure 2-11: Wenatchee Valley Bike Network Recommendation.	2-13
Figure 2-12: South End Bike/Ped Access Bridges.	2-14
Figure 2-13: Link Transit Route Map for all routes through Wenatchee and East Wenatchee.....	2-16
Figure 2-14: George Sellar (SR285) Bridge	2-17
Figure 2-15: Recreation Areas	2-23
Figure 2-16: Geologic Map	2-39
Figure 2-17: Downtown Connection Land Use and Parcels.....	2-43
Figure 2-18: SR285 Expansion Land Use and Parcels.....	2-44
Figure 2-19: Mid-Valley Crossing Land Use and Parcels	2-45
Figure 2-20: Malaga/Rock Island Industrial Area Crossing Area Land Use and Parcels.....	2-46
Figure 3-1: 4 th Crossing Location Options Overview Sellar (SR285) Bridge.....	3-1
Figure 3-2: Mid-Valley Crossing Location	3-2
Figure 3-3: Downtown Connection Alignments Considered.....	3-3
Figure 3-4: Downtown Connection Representative Alignment.....	3-4
Figure 3-5: SR285 Expansion Alignments Considered	3-5
Figure 3-6: SR285 Expansion Representative Alignment.....	3-6
Figure 3-7: Mid-Valley Crossing Alignments Considered.....	3-7
Figure 3-8: Mid-Valley Crossing Representative Alignment.....	3-7
Figure 3-9: Malaga/Rock Island Industrial Area Crossing Alignments Considered	3-8
Figure 3-10: Malaga/Rock Island Industrial Area Representative Alignment.....	3-8
Figure 3-11: Representative Concept – Downtown Connection	3-13
Figure 3-12: Representative Concept – SR285 Expansion	3-14
Figure 3-13: Representative Concept – Mid-Valley Crossing	3-15
Figure 3-14: Mid-Valley Crossing - Intersections	3-16
Figure 3-15: Representative Concept – Malaga/Rock Island Industrial Area	3-17
Figure 4-1: 2050 PM Peak Hour Volumes – Downtown Connection	4-2
Figure 4-2: 2050 PM Peak Hour Volumes – SR285 Expansion.....	4-11
Figure 4-3: 2050 PM Peak Hour Volumes – Mid-Valley Crossing	4-20
Figure 4-4: 2050 PM Peak Hour Volumes – Malaga/Rock Island Industrial Area Crossing	4-29

List of Tables

Table 1-1: Public Comments	1-5
Table 2-1: Number of Crashes by Type (2017-2022)	2-1
Table 2-2: Species Listed under the Endangered Species Act (Downtown Connection)	2-18
Table 2-3: WDFW Priority Habitats and Species (Downtown Connection).....	2-18
Table 2-4: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (Downtown Conn).....	2-19
Table 2-5: Downtown Connection, 2021 Census Data	2-21
Table 2-6: Soil Types and Farmland Classifications (Downtown Connection)	2-22
Table 2-7: Species Listed under the Endangered Species Act (SR285 Expansion)	2-24
Table 2-8: WDFW Priority Habitats and Species (SR285 Expansion).....	2-24
Table 2-9: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (SR285 Expansion) ..	2-25
Table 2-10: SR285 Location, 2021 Census Data.....	2-26
Table 2-11: Soil Types and Farmland Classifications (SR285 Expansion).....	2-27
Table 2-12: Species Listed under the Endangered Species Act (Malaga)	2-33
Table 2-13: WDFW Priority Habitats and Species (Malaga/Rock Island Industrial Area).....	2-34
Table 2-14: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (Malaga/Rock Island Industrial Area)	2-35
Table 2-15: Malaga Location, 2021 Census Data	2-36
Table 2-16: Soil Types and Farmland Classifications (Malaga/Rock Island Industrial Area)	2-37
Table 2-17: Anticipated Environmental Permitting and Associated Regulatory Clearances	2-38
Table 4-1: Anticipated Environmental Permitting and Associated Regulatory Clearances	4-9
Table 4-3: Anticipated Environmental Permitting and Associated Regulatory Clearances	4-18
Table 4-4: Potential Acquisition Costs	4-19
Table 4-5: Anticipated Environmental Permitting and Associated Regulatory Clearances	4-26
Table 4-6: Potential Acquisition Costs	4-28
Table 4-7: Anticipated Environmental Permitting and Associated Regulatory Clearances	4-35
Table 4-8: Potential Acquisition Costs	4-36

Appendices

Appendix A – Study Advisory Committee (SAC), Link Transit and Chelan PUD Meeting Notes

Appendix B – Environmental Background Information

Appendix C – Desktop Geotechnical Review Memorandum

Appendix D – 4th Crossing Location Review Summary

Appendix E – Planning-Level Cost Estimates

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EXECUTIVE SUMMARY

Background and Objectives

Population and employment growth in the Wenatchee Valley is expected to continue, resulting in growth in vehicular and freight traffic. The Wenatchee Valley (Wenatchee and East Wenatchee) is divided by the Columbia River, with only two east-west crossings. The George Sellar Bridge (SR285) directly connects Wenatchee and East Wenatchee and is already nearing capacity during peak periods. To the north, the Odabashian Bridge (US 2/97) crossing connects the north-end of the valley. This study contemplates a new Columbia River crossing that would address key growth-related issues such as congestion, freight and multi-modal mobility, and economic development.

A third crossing has been discussed in the Wenatchee Valley for some time. CDTC recognizes the timeline it will take to plan, fund, design and build such a significant project and is starting the process with this Study. The intent of the study is to apply concept-level planning, environmental and engineering analyses to understand the magnitude of the costs, benefits and impacts for up to four river crossing location options, each location option having its own unique purpose or value proposition. This is the first step to collect enough information to understand the outcomes of a third crossing and inform policies and investment priorities in the next CDTC Regional Transportation Plan (RTP) update.

The following are key objectives of the study:

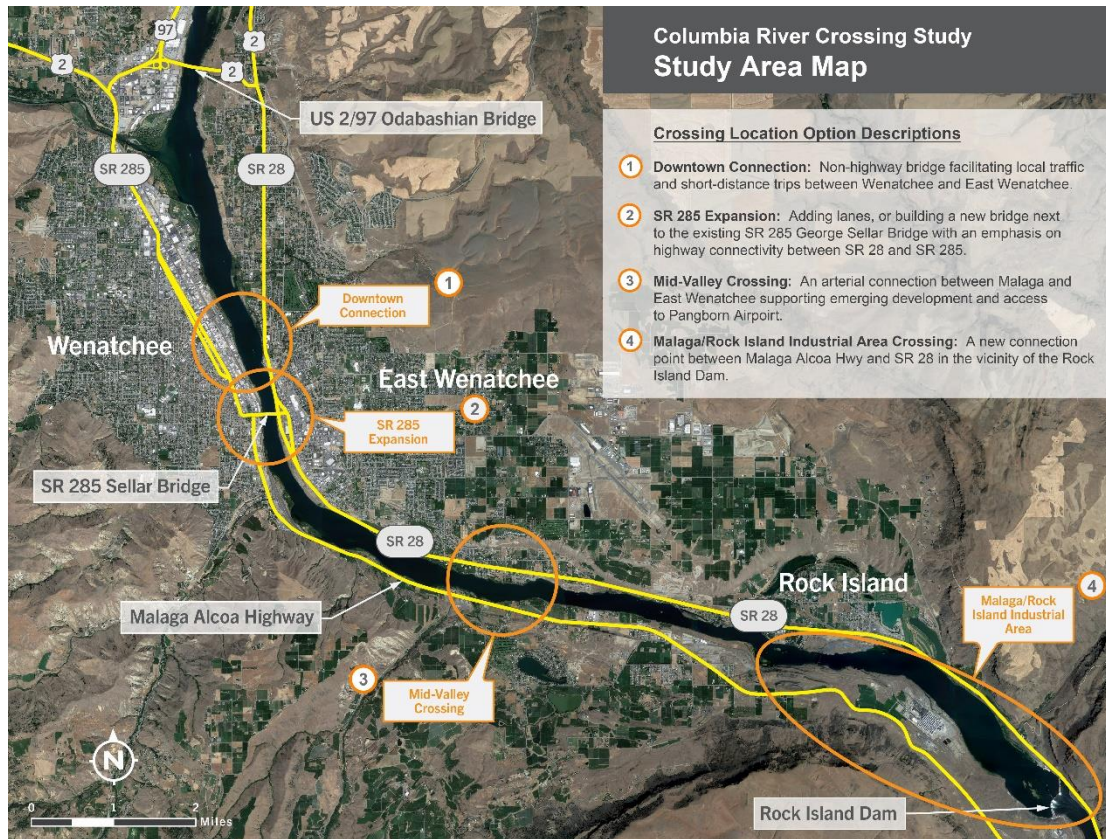
- Apply concept-level planning, environmental and engineering analyses to understand magnitude of costs, benefits and impacts for up to four river crossing locations.
- Evaluate river crossing concepts on their individual merits without comparing, prioritizing, or recommending a preferred alternative.

Study Process

Baseline Conditions

The team reviewed existing planning documents, traffic and crash data to understand current and planned (2050) baseline traffic scenario. Regional plans for non-motorized traffic, freight and transit were reviewed. High-level desktop analyses and early consultation with environmental agencies was conducted to ascertain potential resource issues and permitting requirements. Existing field conditions and documentation were reviewed to understand baseline geotechnical information to support potential bridge foundation requirements. The existing George Sellar Bridge was reviewed to understand feasibility for expansion. GIS data (roadways, property boundaries, jurisdictional boundaries, etc.) was used to develop base maps and understand property ownerships.

A multi-jurisdictional Study Advisory Committee (SAC), consisting of transportation professionals from the Cities of Wenatchee, East Wenatchee and Rock Island, Chelan and Douglas Counties, and WSDOT, was engaged to communicate and solicit input on draft baseline conditions information. A workshop was conducted to identify a potential additional crossing location to study further.



Concept Development and Analysis

Three general, potential bridge locations had already been identified by CDTC staff. To ensure a comprehensive review of other bridge locations, the consultant team analyzed the existing transportation network and provided recommendations to the SAC for a potential fourth crossing location to be studied further. The study area and four crossing locations are illustrated below.

For each of the four crossing locations, the consultant team identified a feasible representative alignment. Concept plans and typical sections were generated for each representative alignment. Bridge types and rough sizes were determined. Concept plans include potential improvements required to make feasible traffic and non-motorized connections to the existing and planned network as required. Rough order-of-magnitude (ROM) cost estimates were developed for each crossing location.

The draft crossing plans, sections and estimates were shared with the SAC, Link Transit and Chelan PUD to obtain input for refinements.

Concept Evaluation

The consultant team evaluated each concept for specific traffic operations, capital and life-cycle costs, and environmental, property and land use impacts.

Initial evaluation findings were shared with the SAC to solicit feedback and identify potential refinements. Summaries for each crossing area are provided below.

Downtown Connection

Value Proposition: Arterial connection facilitating local and short-distance trips between downtown cores of Wenatchee and East Wenatchee.

Planning-Level Capital Cost (\$2024):

\$156 million to \$272 million

Benefits and Impacts:

Traffic

- Shifts 1,400 peak hour trips from Sellar Bridge
- Minor shifting of traffic on network near bridge ends requires traffic signal modifications, new signals, signal timing enhancements, new roundabout, and signing, marking and lighting modifications approaching the new bridge end
- Slight operational improvements to Sellar Bridge

Active Transportation

- Provides active transportation connections between two downtown cores
- No connection to Apple Capital Loop Trail due to grade differences

Transit

- High value connection from Columbia Station to Valley Mall Pkwy
- May result in transit routes shifting from Sellar Bridge

Freight

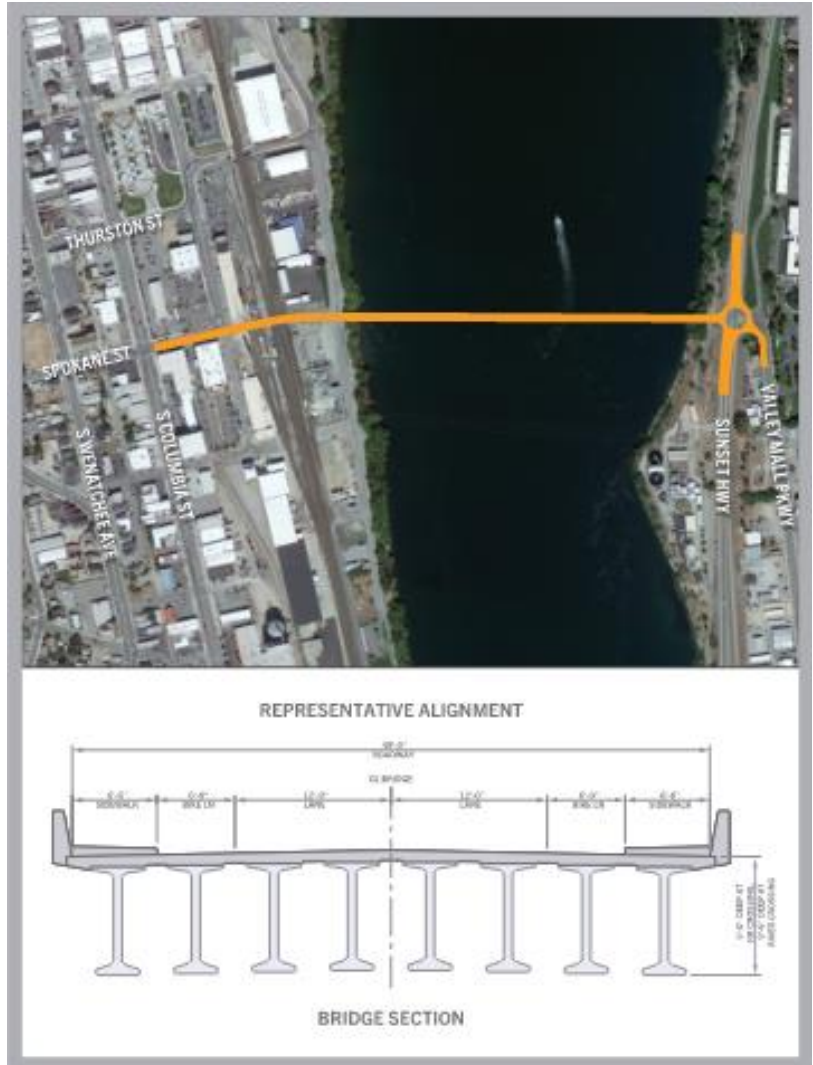
- Regional freight trips expected to remain on Sellar Bridge

Environmental

- Natural resource impacts to Columbia River and associated riparian areas
- Cultural and Section 4(f) resource impacts to the Downtown Wenatchee Historic District and Apple Capital Loop Trail
- NEPA review level anticipated to be an Environmental Assessment (EA)

Property and Land Use

- Chelan PUD intends to expand the waterfront substation in Wenatchee
- Potential to enhance economic benefit to both downtown cores
- Limited permanent impacts to existing businesses



SR285 Expansion

Value Proposition: Providing additional highway capacity and connectivity to Sellar Bridge (SR285).

Planning-Level Capital Cost (\$2024):

\$182 million to \$318 million

Benefits and Impacts:

Traffic

- Couplet envisioned with Sellar Bridge handling westbound (WB) trips and new parallel bridge handling eastbound (EB) trips
- Shifts 3,400 EB peak hour trips from Sellar Bridge
- Slight increase in WB traffic due to added capacity
- Shifting of traffic direction and volumes on network near bridge ends requires traffic signal modifications, new signals, signal timing enhancements, ITS signal coordination, lane allocations, ramp widening, and signing, marking and lighting modifications approaching the new bridge ends

Active Transportation

- Existing multi-use connections maintained on Sellar Bridge and ends.

Transit

- Congestion improvements benefit travel times and reliability
- Impact to current bus service on the west side of Fred Meyer

Freight

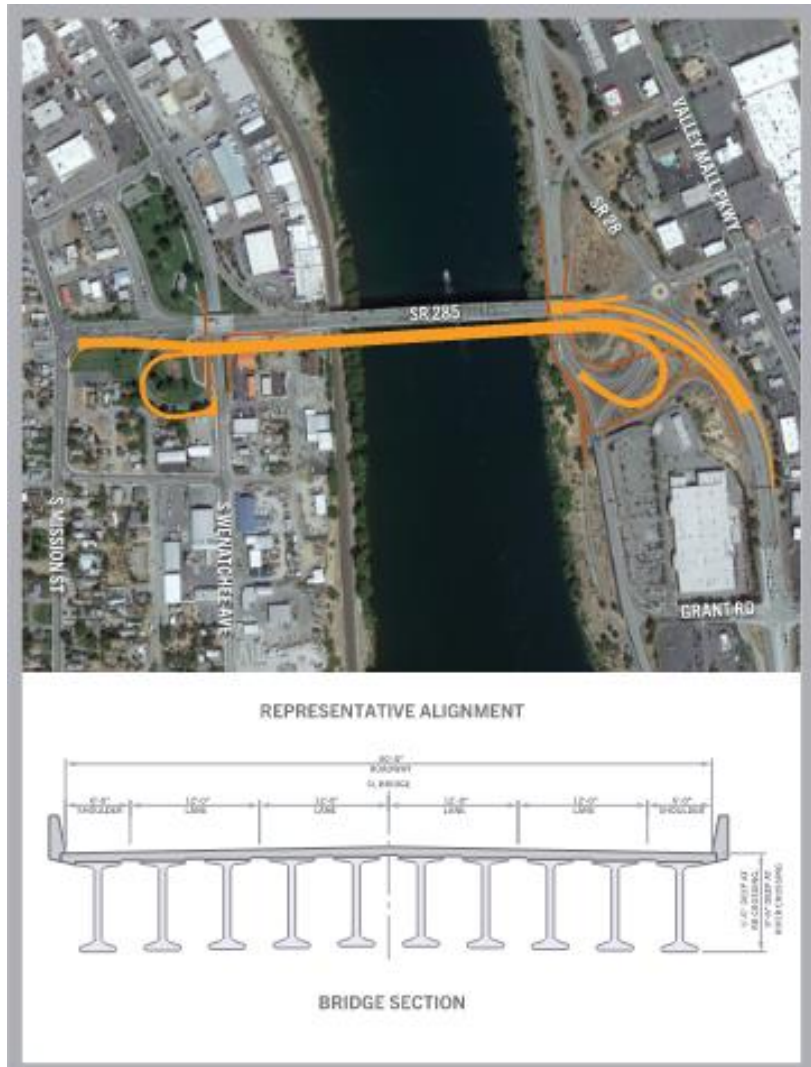
- Travel times benefit freight mobility
- Freight access to Fred Meyer is impacted

Environmental

- Natural resource impacts to Columbia River and associated riparian areas
- Cultural and Section 4(f) resource impacts to the Existing Sellar Bridge, Apple Capital Loop Trail, Mission St Park, Train Park
- NEPA review level anticipated to be an Environmental Assessment (EA)

Property and Land Use

- Leverages existing WSDOT rights-of-way, but impacts several private properties and businesses



Mid-Valley Crossing

Value Proposition: Arterial connection facilitating local and short-distance trips between Malaga and East Wenatchee and supporting emerging development and access to Pangborn Airport.

Planning-Level Capital Cost (\$2024):

\$186 million to \$326 million

Benefits and Impacts:

Traffic

- Shifts 580 peak hour trips from Sellar Bridge
- Minor shifting of traffic on network near bridge ends requires new roundabouts, new signal at Perry Ave/Rock Island Rd, new WB left-turn lane at Malaga-Alcoa / Stemilt Creek Rd
- Slight reduction in SR28 traffic between the bridge and SR285

Active Transportation

- Multi-use path on new bridge may connect planned multi-use paths on both sides of the river
- Connection between Hydro Park and future Malaga Waterfront Park

Transit

- Existing service to Rock Island may be benefited by new connection between Rock Island Rd and SR28
- Opportunity to expand service on both sides of river as warranted

Freight

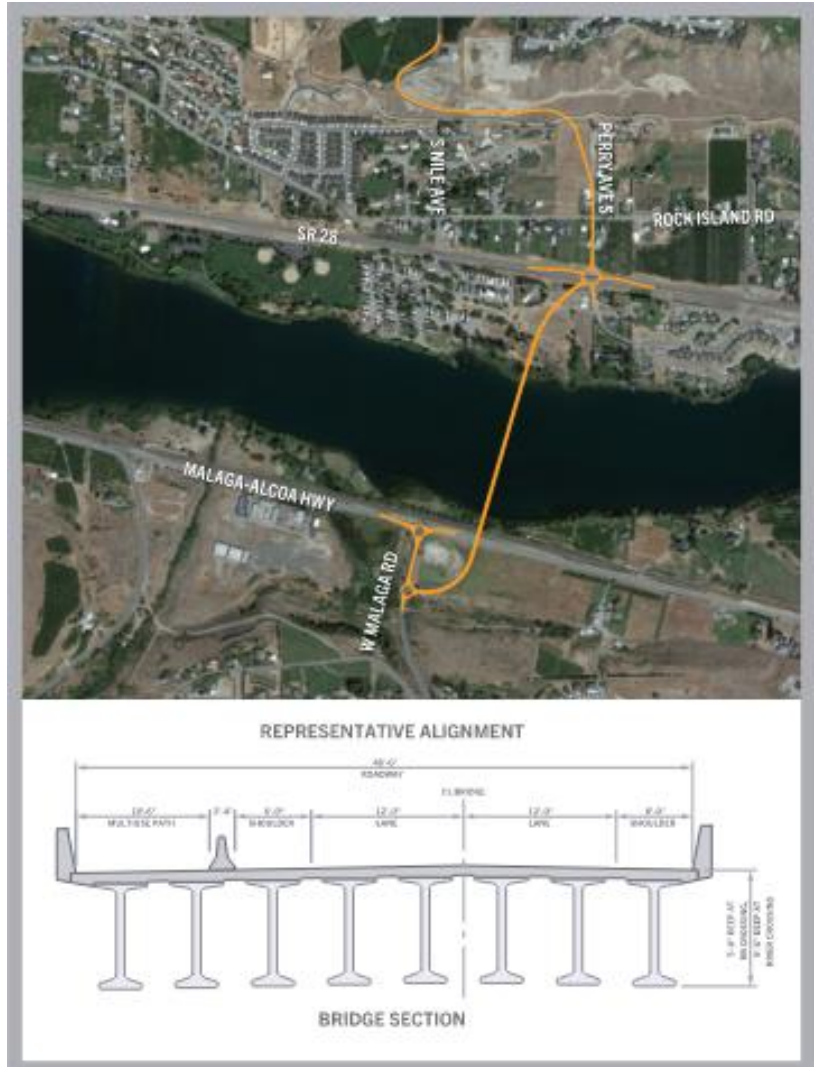
- More direct route to/from freight generators in south Wenatchee and Malaga
- Regional freight trips expected to remain on Sellar Bridge

Environmental

- Natural resource impacts to Columbia River and associated riparian areas
- Significant cultural properties likely in this area
- Section 4(f) resource impacts to the Apple Capital Loop Trail and Hydro Park
- NEPA review level anticipated to be an Environmental Assessment (EA)

Property and Land Use

- One residential parcel directly impacted
- Potential catalyst for development of currently under-utilized parcels



Malaga/Rock Island Industrial Area

Value Proposition: Arterial connection facilitating local and short-distance trips between Rock Island and Malaga-Alcoa Highway supporting emerging industrial development.

Planning-Level Capital Cost (\$2024):

\$116 million to \$203 million

Benefits and Impacts:

Traffic

- Shifts 300 peak hour trips from Sellar Bridge
- Minor shifting of traffic on network near bridge ends requires new roundabouts at SR28 and Malaga-Alcoa Hwy, WB left-turn lane at Malaga-Alcoa/Stemilt Creek Rd and Malaga-Alcoa/Malaga Rd intersections
- Slight reduction in SR28 traffic between the bridge and SR285

Active Transportation

- Multi-use path on new bridge may provide an opportunity for crossing SR28 and connecting to Rock Island
- Multi-use path on new bridge could connect planned pathways on both sides of the river, creating another “loop trail.”

Transit

- No existing service in this area
- Opportunity to expand service on both sides of river as warranted

Freight

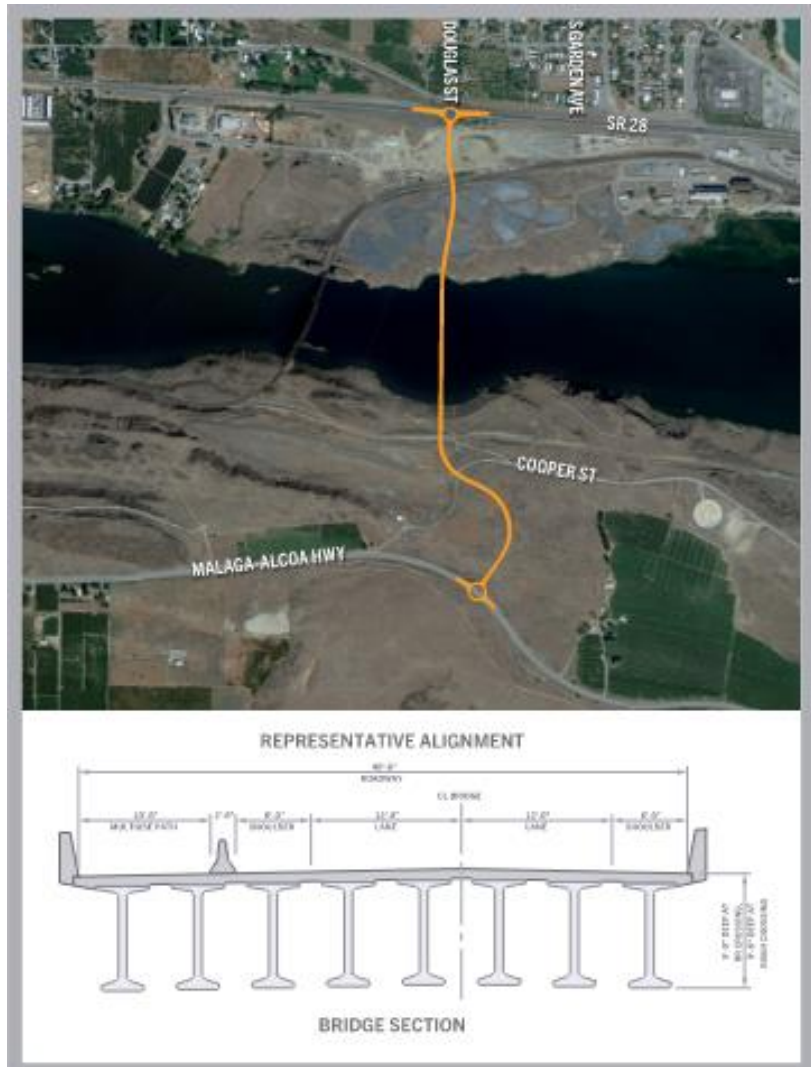
- More direct route to/from freight generators in south Wenatchee and Malaga
- Regional freight trips expected to remain on Sellar Bridge

Environmental

- Natural resource impacts to Columbia River and associated riparian areas, Shrubsteppe Habitat, PHS listed Biodiversity Corridor on cliffs/bluffs
- Potential for significant historic properties
- NEPA review level anticipated to be an Environmental Assessment (EA)

Property and Land Use

- Impacts largely unused properties
- Potential for direct connection to Rock Island Industrial Redevelopment Site
- Catalyst for development of currently under-utilized parcels



1. BACKGROUND AND OBJECTIVES

1.1 Background

Population and employment growth in the Wenatchee Valley is expected to continue, resulting in growth in vehicular and freight traffic. The Wenatchee Valley (Wenatchee and East Wenatchee) is divided by the Columbia River, with only two east-west crossings. The George Sellar Bridge (SR285) directly connects Wenatchee and East Wenatchee and is already nearing capacity during peak periods. To the north, the Odabashian Bridge (US 2/97) crossing connects the north-end of the valley. This study contemplates a new Columbia River crossing that would address key growth-related issues such as congestion, freight and multi-modal mobility, and economic development.

A third crossing has been discussed in the Wenatchee Valley for some time. CDTC recognizes the timeline it will take to plan, fund, design and build such a significant project and is starting the process with this Study. The intent of the study is to apply concept-level planning, environmental and engineering analyses to understand the magnitude of the costs, benefits and impacts for up to four river crossing location options, this is the first step to collect enough information to understand the outcomes of a third crossing and inform policies and investment priorities in the next CDTC Regional Transportation Plan (RTP) update. To that end, CDTC is not looking for the study to result in a single, preferred recommendation.

1.2 Study Area

Figure 1-1 depicts the approximate study area for this project. Potential crossing locations will be examined along the valley from the Odabashian Bridge (US 2/97) to south of the Rock Island Dam. CDTC and the Study Advisory Committee (SAC) have identified four potential crossing locations that, each to its own degree, addresses current and anticipated traffic growth and congestion, freight mobility, multi-modal mobility and economic development opportunities. The four locations include:

1. **Downtown Connection:** This would be a non-highway bridge, facilitating local traffic and short-distance trips between Wenatchee and East Wenatchee.
2. **SR285 Expansion.** This would add lanes or a parallel bridge structure next to the SR285 George Sellar Bridge with an emphasis on highway connectivity between SR28 and SR285.
3. **Mid-Valley Crossing.** This would be a new arterial connection between Malaga and East Wenatchee supporting emerging development and access to/from Pangborn Airport.
4. **Malaga/Rock Island Industrial Area Crossing.** This would be a new connection between Malaga-Alcoa Highway and SR28 in the vicinity of Rock Island Dam to catalyze industrial development in Malaga.

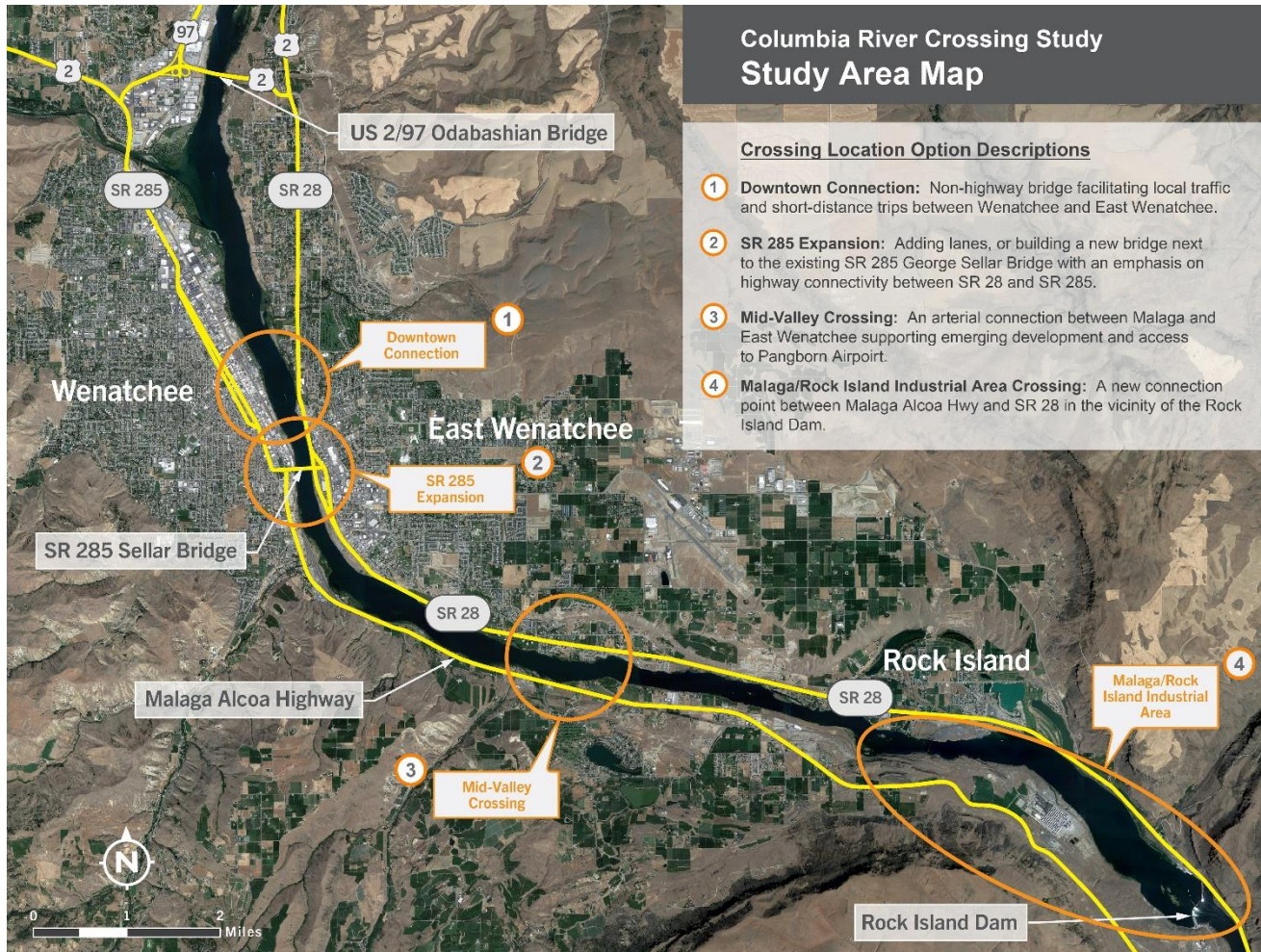


Figure 1-1: Study Area Map

1.3 Objectives

The following are key objectives of the study:

- Apply concept-level planning, environmental and engineering analyses to understand magnitude of costs, benefits and impacts for up to four river crossing locations.
- Evaluate river crossing concepts on their individual merits without comparing, prioritizing, or recommending a preferred alternative

1.4 Study Process

Figure 1-2 illustrates the Columbia River Crossing Study process. The process consists of five key steps. Each step engages the SAC to share information and inform the process throughout.

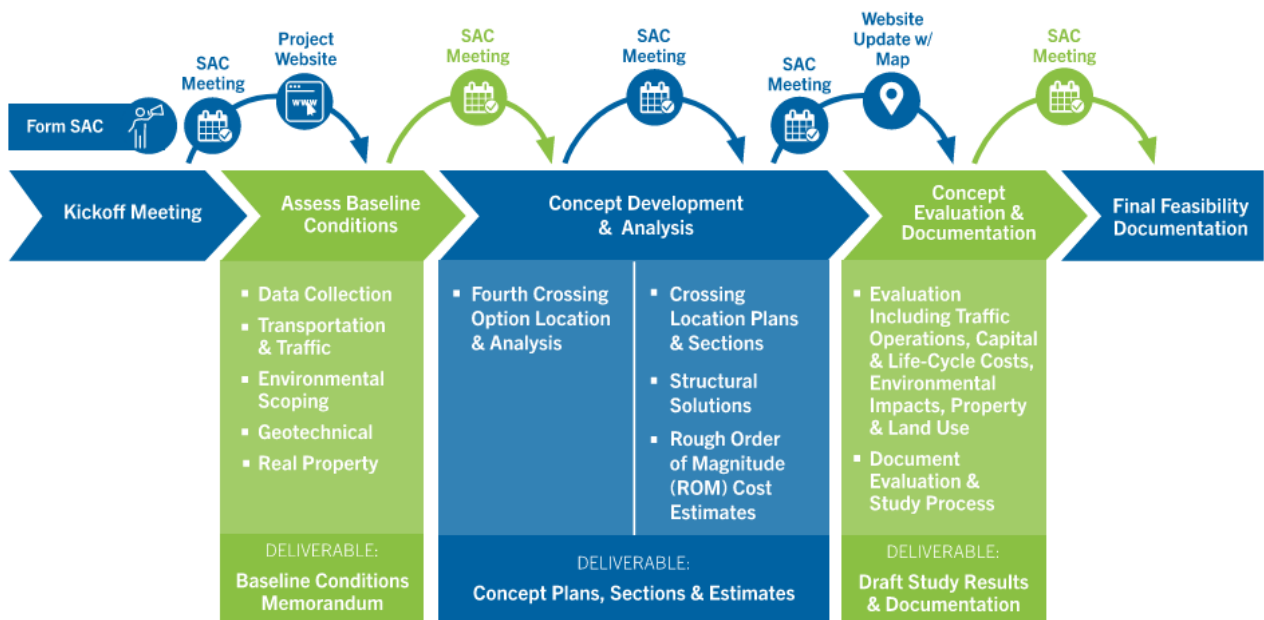


Figure 1-2: Study Process

1. **Kickoff Meeting.** The consultant team kicked off the project with CDTC staff as well as SAC members. Project goals and objectives were confirmed, and initial baseline observations, issues and opportunities were shared. A project web page was established on the CDTC website.
2. **Assess Baseline Conditions.** The consultant team reviewed existing planning documents, traffic and crash data to understand current and planned (2050) baseline traffic scenario. Regional plans for non-motorized traffic, freight and transit were reviewed. High-level desktop analyses and early consultation with environmental agencies was conducted to ascertain potential resource issues and permitting requirements. Existing field conditions and documentation were reviewed to understand baseline geotechnical information to support potential bridge foundation requirements. The existing George Sellar Bridge was reviewed to understand feasibility for expansion. GIS data (roadways, property boundaries, jurisdictional boundaries, etc.) was used to develop base maps and understand property ownerships.

The SAC was engaged to communicate and solicit input on draft baseline conditions information.

Concept Development & Analysis. Three general, potential bridge locations had already been identified by CDTC staff. To ensure a comprehensive review of other bridge locations, the consultant team analyzed the existing transportation network and provided recommendations to the SAC for a potential fourth crossing location to be studied further. The consultant team reviewed recommendations with the CDTC and the SAC to review and identify a fourth crossing location.

For each of the four crossing locations, the consultant team identified a feasible representative alignment. Concept plans and typical sections were generated for each representative alignment. Bridge types and rough sizes were determined. Concept plans include potential improvements required to make feasible traffic and non-motorized connections to the existing and planned network as required. Rough order-of-magnitude (ROM) cost estimates were developed for each crossing location.

The draft crossing plans, sections and estimates were shared with the SAC, Link Transit and Chelan PUD to obtain input for refinements.

- 3. Concept Evaluation & Documentation.** The consultant team evaluated crossing locations for specific traffic operations, capital and life-cycle costs, and environmental, property and land use impacts.

Initial evaluation findings were shared with the SAC to solicit feedback and identify potential refinements.

- 4. Final Study Documentation and CDTC Board Presentation.** The consultant team compiled documentation of the Study and presented findings to the CDTC Board.

1.5 Study Advisory Committee

As indicated in the process diagram, the study relied on engagement from a multi-jurisdictional Study Advisory Committee (SAC). The SAC was made up of representatives from CDTC, Chelan County, Douglas County, WSDOT, and the Cities of Wenatchee, East Wenatchee and Rock Island. The SAC provided input throughout the study via the five SAC meetings:

Meeting #1 – June 6, 2023. Reviewed project background, initial analyses.

Meeting #2 – August 2, 2023. Reviewed baseline conditions summary.

Meeting #3 – September 20, 2023. Reviewed 4th crossing locations and representative alignments.

Meeting #4 – November 7, 2023. Reviewed initial draft concepts.

Meeting #5 – January 11, 2024. Reviewed revised concepts, cost estimates and evaluations.

Notes from the SAC meetings are provided in Appendix A.

1.6 Stakeholder Engagement and Public Outreach

Link Transit and Chelan County Public Utilities District (PUD) were engaged to provide input on the draft concepts via the following meetings:

Link Transit – November 20, 2023. Reviewed initial draft concepts and solicited input on benefits and impacts to current and planned transit.

Chelan PUD – December 19, 2023. Reviewed initial draft concepts and solicited input on benefits and impacts to current and planned PUD facilities and operations.

Notes from the Link Transit and Chelan PUD meetings are provided in Appendix A.

A project web page was developed and hosted on the CDTC's [@chelan-douglas.org](https://www.chelan-douglas.org) domain to provide public access to study information. Study information was updated during the process. Project team contact information was provided to respond to questions and comments.

The draft study documents were posted on the CDTC project web page for public comment from March 18, 2024 to April 6, 2024. The public comments received are provided in Table 1-1. The comments received generally support planning for a new bridge crossing. A number of the comments provide support for or, opposition to, specific crossing locations provided. The Washington State Department of Fish and Wildlife provided input and clarification to habitats deemed 'sensitive locations'.

Table 1-1: Public Comments

Commentor Date	Comment
Matthew Cox 3/19/24	<p><i>It seems to me that this bridge is only being considered because Microsoft is unable to transport their generators across the Odabashian and George Sellar bridges as they cannot bear the weight. This was brought to our attention last year. The questions that the transportation board needs to address are; Is the design and structural load of this bridge being considered for Microsofts benefit? And if yes, why is this bridge being built for a trillion dollar organization on the backs of local tax payers?</i></p> <p><i>Because the normal load of the bridge should be no more excessive than what Odabashian and George Sellar's already delivers. So any design that incorporates excessive loads like what Microsoft is requiring already stinks of corruption.</i></p> <p><i>This needs to be made fully transparent to the public.</i></p>
Seth Super 3/19/24	<p><i>To whom it concerns,</i></p> <p><i>Traffic across the Wenatchee River Bridge, Odabashian and George Sellar can be very congested. Especially when accidents shut down lanes. It appears all the studies are for a bridge to the south. Why not solve both problems with one bridge connecting 5th Street in Wenatchee to 19th Street in East Wenatchee? This would provide a more direct route to Wenatchee businesses for many residential areas in East Wenatchee. It would greatly reduce these commutes and relieve congestion greatly on the other bridges.</i></p> <p><i>George Sellar already provides a direct path to the airport via Grant Road which is the best road to accommodate traffic to the airport. Of the suggestions an addition to this bridge is the most practical and efficient.</i></p> <p><i>While we are planning bridges; How about a bridge connecting north of Orondo to Entiat! Orondo has the flat buildable land and a nearby golf course. Entiat is the ultimate connection to outdoor adventure. Connecting the two would dramatically increase the economy of these towns as Orondo becomes more residential.</i></p> <p><i>Thank you for your consideration,</i></p> <p><i>Seth</i></p>
Shawn DuLac 3/20/24	<p><i>Good Day,</i></p> <p><i>After reviewing the plans for the 4 opportunities for a 3rd bridge, I found the proposal for Rock Island near the Alcoa plant to be the preferred choice as it would not impact day to day and would provide an opportunity for future growth in the Rock Island and Malaga areas. I think this would provide an additional catalyst for those growing communities and a chance for other businesses to come in with better access to the highway.</i></p> <p><i>Thanks,</i></p> <p><i>Shawn Du Lac</i></p> <p><i>East Wenatchee, WA</i></p>
Brigitte Ranne 3/21/24	<p><i>Hi,</i></p> <p><i>I prefer the SR 285 expansion or the downtown connection. These will do the most to reduce peak hour traffic jams.</i></p> <p><i>I am strongly opposed to the mid- valley connection and the Alcoa Rock island location. Both of these will greatly increase drive through traffic on the Malaga Highway. There are many homes that are accessed directly off the highway. More traffic would increase road noise and decrease the quality of life in the Malaga community. I do not support further industrial development in Malaga. Our beautiful natural landscape should not be converted to industrial sprawl.</i></p> <p><i>Brigitte Ranne</i></p>
Jan and Brad Flatten 3/21/24	<p><i>I've reviewed the Columbia River Crossing study and I must say I can't even believe either of the bridges down by Malaga would be considered. They do nothing to alleviate the traffic pressure in Wenatchee which is a disaster at this point. I drive through Wenatchee on a regular basis (although I avoid it altogether when I am going to East Wenatchee using the north bridge). The only proposals that should go forward into a full study would be the downtown connector or expanding the south bridge. I can see pros and cons for both of those but a full study will show those impacts in depth. I would also like to comment that your website is not very intuitive. You should have a link for comments right on the same page as the project. After reading through the</i></p>

Commentor Date	Comment
	<p><i>project I never found where to submit comments or when the comment period was open. I had to go to you main menu to find a place to comment. Thanks for listening.</i></p> <p><i>Jan Flatten</i> <i>Cashmere, WA</i></p>
<p>Doug Miller 3/22/24</p>	<p><i>As these proposals are considered, it appears a connection between South Kentucky and South Perry Streets in Douglas County and the Malaga Highway in Chelan County are most logical.</i></p> <p><i>Regards,</i> <i>Douglas Miller</i> <i>Wenatchee, WA</i></p>
<p>Cindy Garrett 3/22/24</p>	<p><i>After looking over the proposals, I would like to vote for #2 a new bridge built next to George Sellar bridge with traffic flowing west on one bridge and east on the other bridge. I don't think the other options will make as much impact for the dollars spent.</i></p> <p><i>Cindy Garrett</i></p>
<p>Adam Shearer 3/22/24</p>	<p><i>Hello, I believe that the mid valley connection bridge will provide the most benefit to the community. As Malaga is expanding with more housing, Microsoft, and other organizations, it would make more sense to alleviate some of that future congestion at the seller bridge with those that commute or would be commuting. Just a thought.</i></p>
<p>Staci Shearer 3/22/24</p>	<p><i>I believe you should consider the malaga to rock island. As a Malaga resident trying to get out of malaga during an accident on the highway is difficult and takes a long time to go over the heights. Plus we will be having microsoft building out here so maybe more vehicles but a bridge would not congest the malaga alcoa highway as much. I have lived in malaga for 6 yrs and love it but fear for the added traffic with the industrial buildings coming our way.</i></p> <p><i>Thanks</i> <i>Staci</i></p>
<p>Krista Herling 3/23/24</p>	<p><i>Hello, as a resident of Malaga, we need another access point in case of fire, rock slide, or other major accident that blocks the road. I would like to greatly advocate for either of the Malaga crossings. Our area is growing like crazy, especially with Microsoft building out here and the Port pushing for more development. If we plan for it now, but the time it's done in 10 years it will be just in time.</i></p> <p><i>Thank you</i></p>
<p>Libby Hall 3/23/24</p>	<p><i>Wenatchee - Malaga Avenue Road to cross over Columbia River to East Wenatchee - Nile Avenue Road, Wenatchee - Crawford Street to cross over to East Wenatchee- Grant Road Interchange</i></p> <p><i>Wenatchee Dead End Street next to Smittys restaurant make an underpass like Thurston Street underpass to cross over to bottom of 27th street East Wenatchee or End of River Ave along with an Interchange to the highway 2/97 intersection at Euclid Ave.</i></p> <p><i>Just an idea,</i> <i>Libby Hall</i></p>
<p>Nathan Forster 3/23/24</p>	<p><i>Dear council members or whoever cares about this,</i></p> <p><i>I am a resident/ veteran of Wenatchee Washington. I am also a Washington state employee and an avid City Skylines 2 player with over 100 hours of play time. Of course I'm a no expert on this matter but I do know one thing, adding more lanes does not solve traffic problems. Instead of building 1 or 10 bridges spanning the great Columbia River we should instead be like other great cities in Europe and have a train loop. My proposal is we build The Apple Capital Metro Loop. The stations would take place in multiple locations across the valley with possible expansion lines to Leavenworth and Moses Lake. These possible stations would be located at:</i></p> <ol style="list-style-type: none"> <i>1: Wenatchee Valley Mall</i> <i>2: Gateway Theater</i> <i>3: Town Toyota Center</i> <i>4: Wenatchee Valley College</i> <i>5: Confluence Health Hospital</i>

Commentor Date	Comment
	<p><i>This metro line would be a lot better than a boring road and would provide better service across the valley and would make Wenatchee a metro hub in the great state of Washington and the United States.</i></p> <p><i>Please take my proposal into serious consideration because this would transform our valley into a better place to live and to visit</i></p> <p><i>Thank you,</i> <i>Nathan Forster</i></p>
Katy O'Grady 3/23/24	<p><i>I support the Mid-valley connection and the Malaga/Rock Island connection. They better distribute bridge traffic and the growth in the Malaga and Rock Island areas.</i></p>
Patrick S 3/24/24	<p><i>I have been saying for years that we needed another bridge. With the increasing traffic and Wenatchee residents commuting in/out of town for work/shopping, even Link Transit has increased their routes. Many are traveling to and from the Quincy area. Also, Rock Island and Malaga have grown significantly and continue to grow. The best place for a new bridge would be near Rock Island/Malaga, since they don't have as much congestion on the roads, yet. It would also add a slower area to cut down on traffic accidents on those highways. In turn decreasing traffic in the Wenatchee area, even a little. Putting another bridge downtown will just make it more congested.</i></p>
Ken Muir WDFW 3/29/24	<p><i>To Whom It May Concern:</i></p> <p><i>The Washington Department of Fish and Wildlife (WDFW) received notice that the Chelan Douglas Transportation Council is accepting comments regarding the proposal referenced above. The Washington Department of Fish and Wildlife (WDFW) interest in this project is based on our agency's mandate to perpetuate fish, wildlife, and their habitat (Regulatory Code of Washington (RCW) 77.04.012). More specifically for this project, WDFW offers our technical assistance and pre-application review for the Hydraulic Project Approval (HPA) permit under the Washington State Hydraulic Code, Chapter 220-660, as well as technical assistance regarding WDFW Priority Habitat and Species (PHS) defined as Fish and Wildlife Habitat Conservation Areas (FWHCAs) under the Shoreline Master Program (SMP) and Critical Area Ordinance (CAO) of Chelan and Douglas Counties as well as the Cities of Wenatchee and East Wenatchee.</i></p> <p><i>WDFW reviewed the materials that were prepared for the proposed Columbia River Crossing Study. The study included a list of State Wildlife Action Plan (SWAP) and Priority Habitat and Species (PHS) information. This information is correct however, we want to clarify what is categorized as a "Sensitive Location". The "Sensitive Location" is masked information due to the sensitivity of the species and not providing their exact location(s). The sensitive species are displayed at the township scale to protect the species and their location.</i></p> <p><i>We look forward to continuing to work with Chelan Douglas Transportation Council on the Columbia River Crossing Project to meet the needs of fish and wildlife as well as the transportation and safety needs of our community. Thank you for considering our comments. WDFW offers our technical assistance to Chelan Douglas Transportation Council as you continue with this project. Our staff are available to coordinate for further review of the project. As the project develops, please send future notices and open comment periods to our centralized regional planning email account at wdfwr2planning@dfw.wa.gov. If you have any questions, please email me at ken.muir@dfw.wa.gov or feel free to call me at 509-670-3291.</i></p>

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2. BASELINE CONDITIONS SUMMARY

2.1 Transportation/Traffic

2.1.1 Current Traffic Conditions

Current traffic conditions collected and reviewed include crash data, average annual daily traffic (AADT), and the regional traffic model. The Washington State Department of Transportation (WSDOT) crash data was provided by the CDTC for a five-year time period, 2017-2022, along SR28, SR285, and Malaga-Alcoa Highway. These three roadways were reviewed as a new bridge crossing, pending location, will likely connect to and impact traffic patterns along each roadway. Within the five-year period a total of 2,289 crashes occurred along these roadways. Table 2-1 provides information on the number of crashes per severity type.

Table 2-1: Number of Crashes by Type (2017-2022)

No Injury	Possible Injury	Suspected Minor Injury	Suspected Serious Injury	Fatal Injury
1,592	467	171	31	8

The following intersections listed below include the location of the 8 fatal crashes between 2017 and 2022.

- Mission St, north of 9th St
- Clean Ave, north of 3rd St
- SR28, south of 13th St
- Malaga-Alcoa Highway, south of Carlson Loop
- Malaga-Alcoa Highway, north of Hedges Rd
- SR28, south of Nile Ave
- SR28, south of Union Ave
- SR28, north of Rock Island Rd

Figures 2-1 through 2-5 below provide information on location of crashes and the severity type.

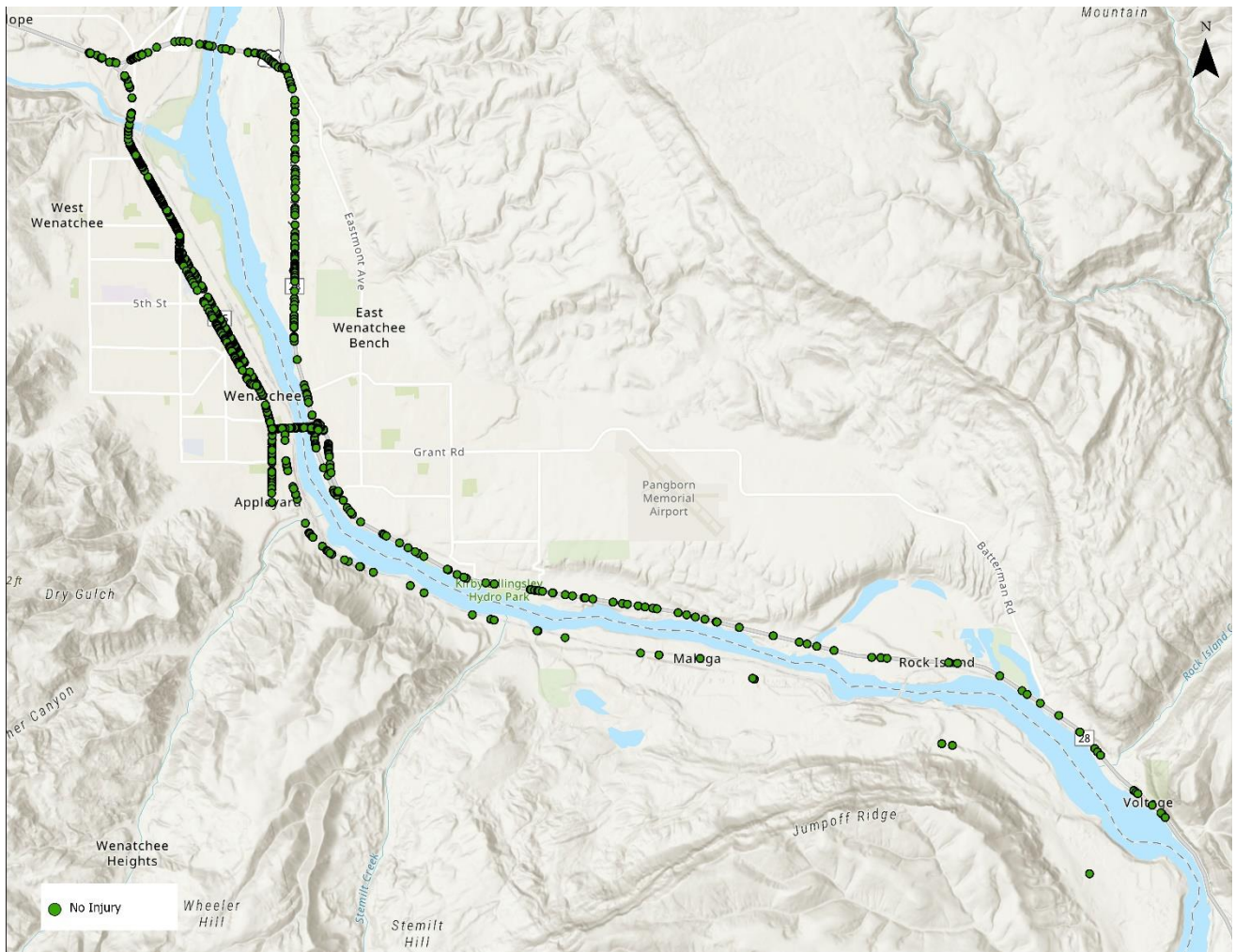


Figure 2-1: Crash Data – No Injury

Source: WSDOT

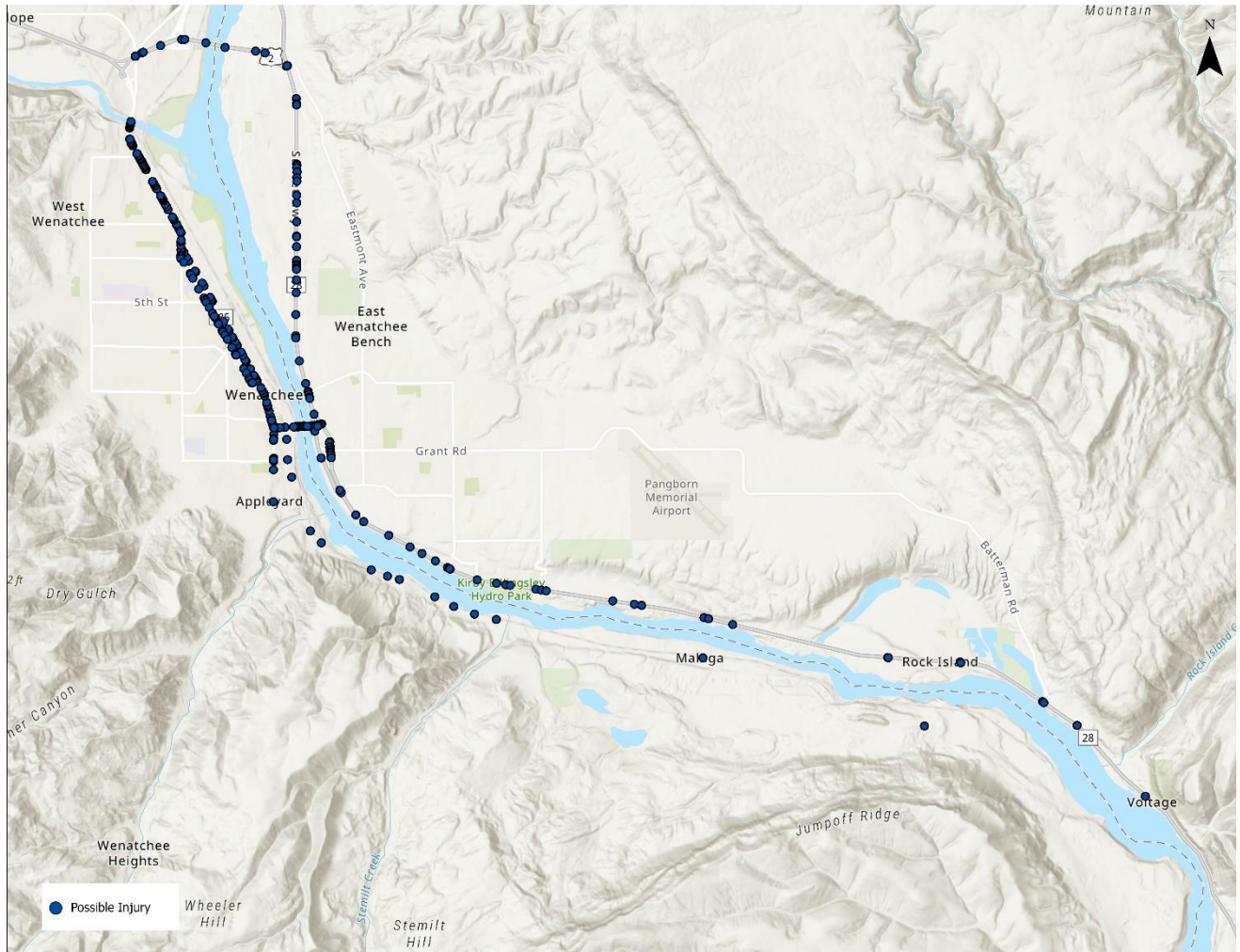


Figure 2-2: Crash Data – Possible Injury

Source: WSDOT

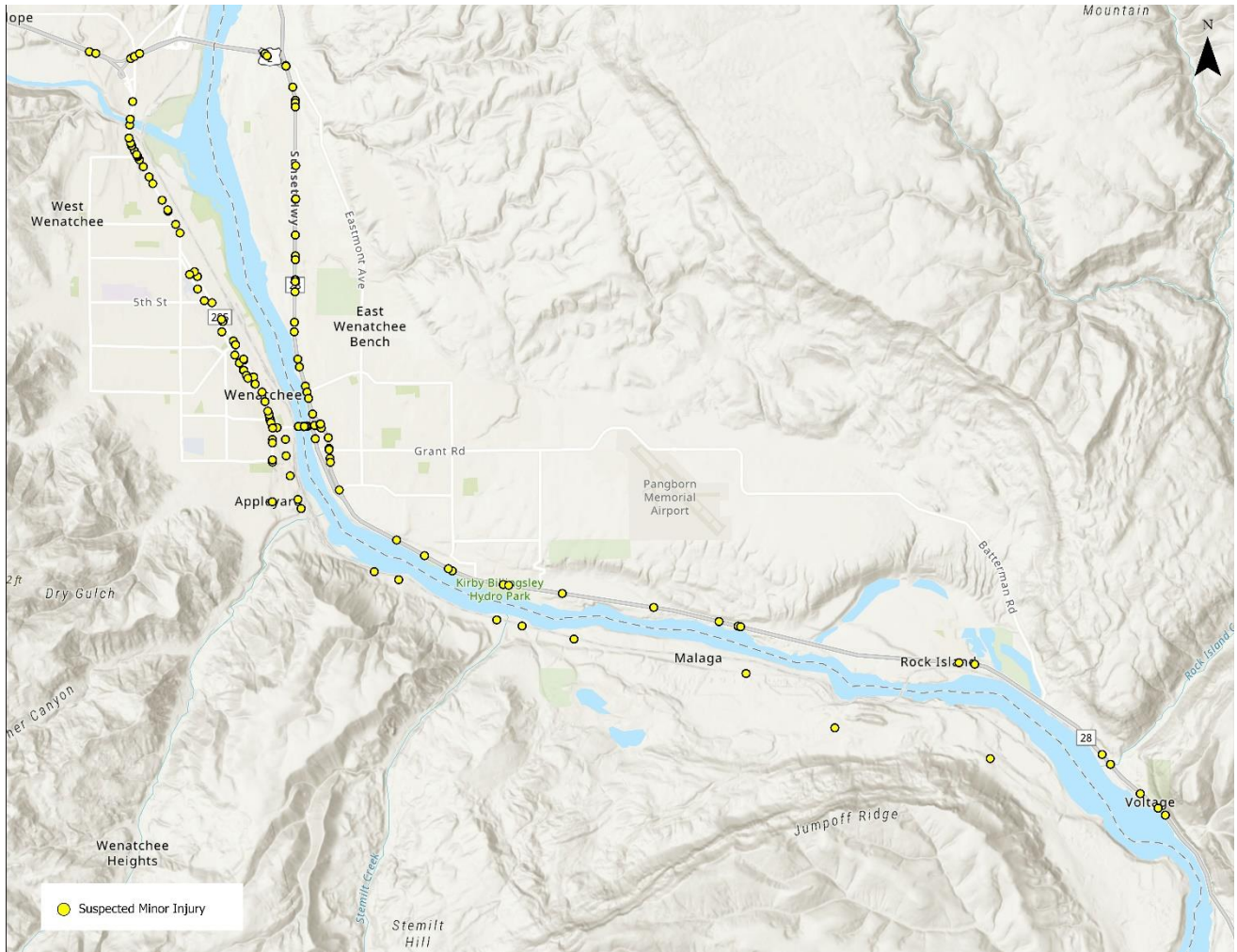


Figure 2-3: Crash Data – Suspected Minor Injury

Source: WSDOT

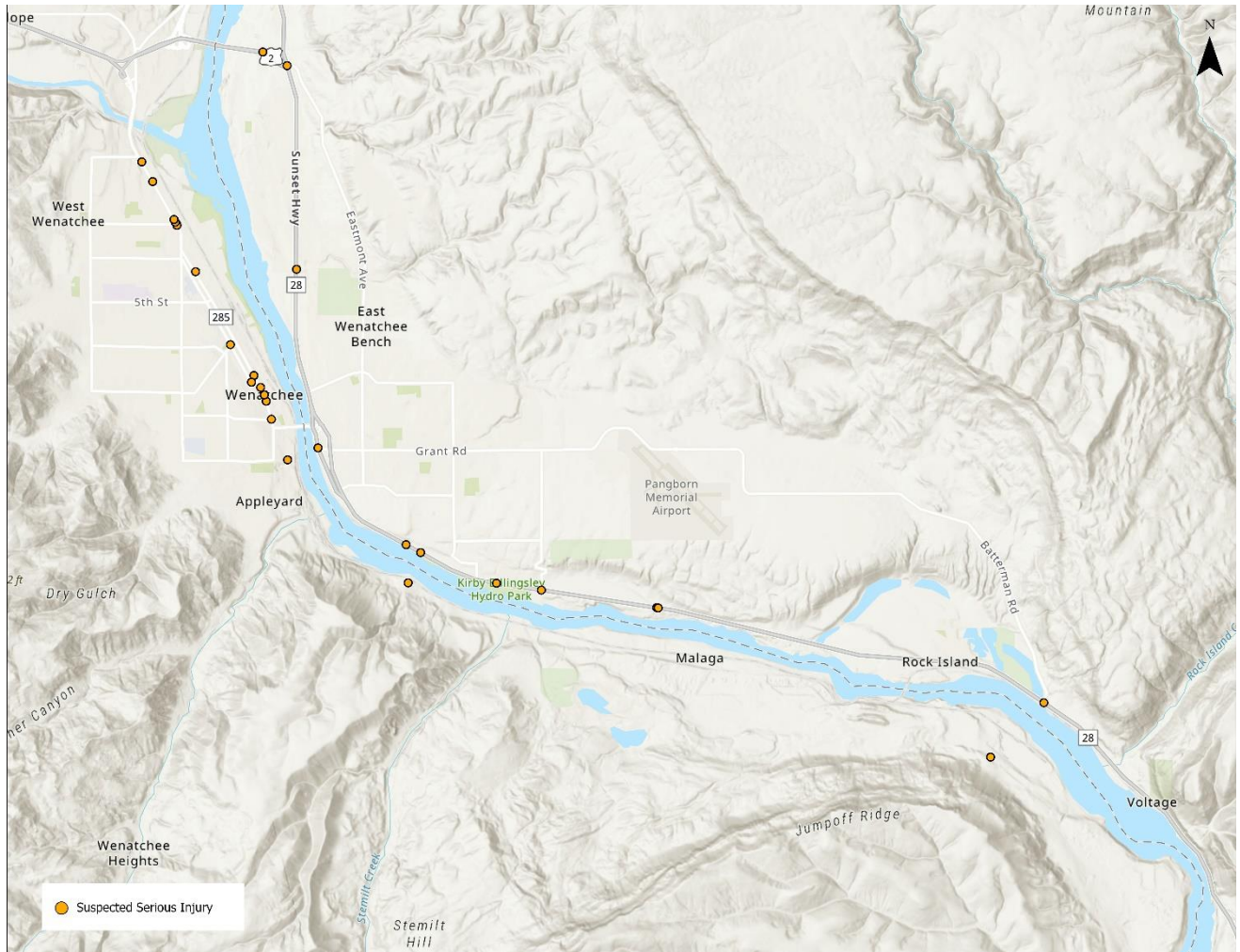


Figure 2-4: Crash Data – Suspected Serious Injury

Source: WSDOT

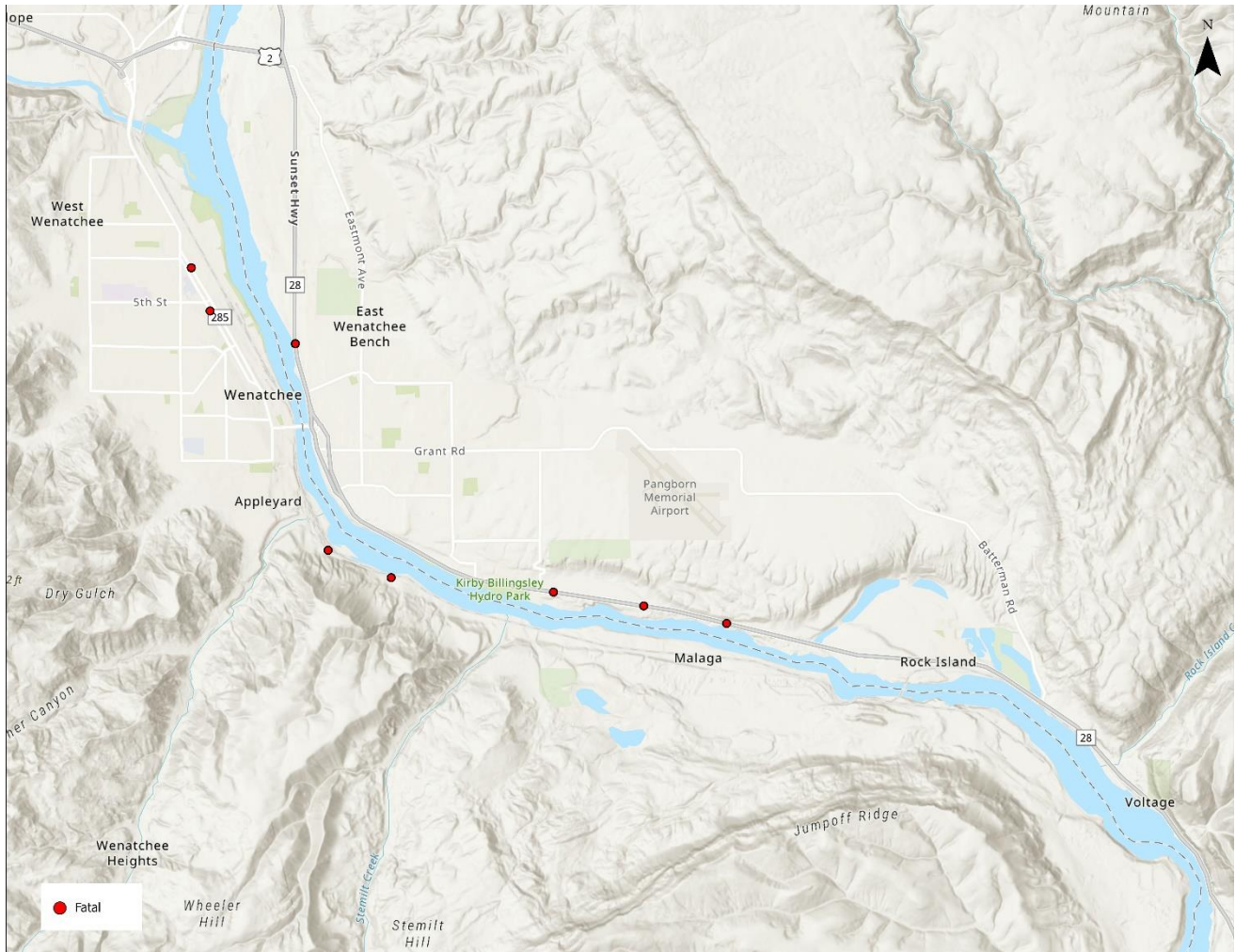


Figure 2-5: Crash Data – Fatal Injury

Source: WSDOT

Traffic volume data was provided by the CDTC Regional Model for PM volumes and PM truck volumes. The CDTC model indicates that regional traffic, traveling through Wenatchee, is using the existing Richard Odabashian Olds Station Bridge (US 2 north crossing). The Senator George Sellar Bridge (SR285 south crossing) is utilized more by local commuters with virtually zero traffic using it as a regional route. Figure 2-6 and Figure 2-7 illustrate the 2023 PM peak hour model traffic volumes and the 2023 PM peak hour model truck traffic, respectively.

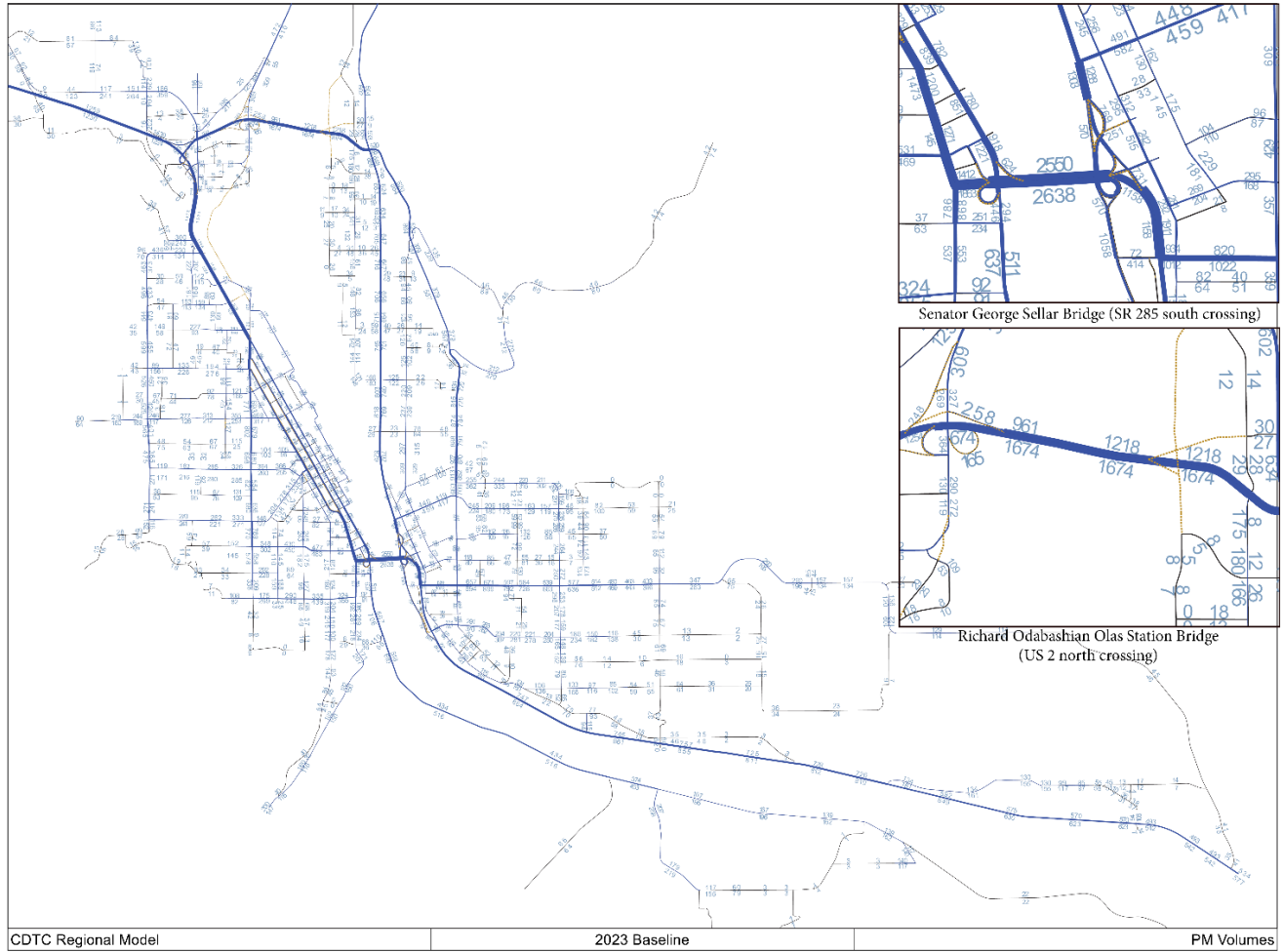


Figure 2-6: 2023 Baseline – PM Volumes

Source: Chelan-Douglas Transportation Council Travel Demand Model

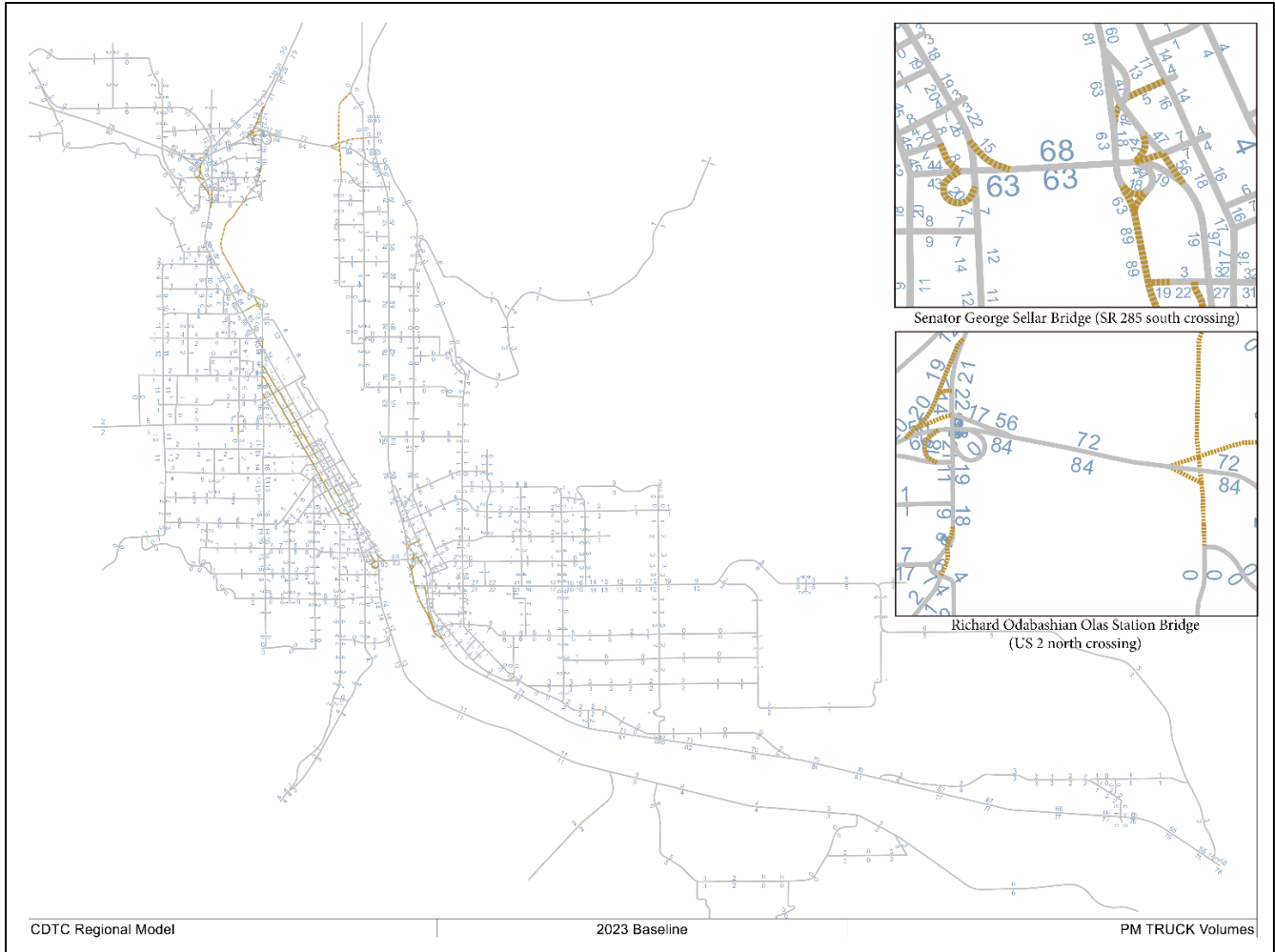


Figure 2-7: 2023 Baseline – PM Truck Volumes

Source: Chelan-Douglas Transportation Council Travel Demand Model

WSDOT AADT data was provided by the CDTC. Figure 2-8 shows the AADT for the project area. The highest AADT is located along SR285 and on the south bridge with over 50,000 trips. The north bridge, along with US 2 and SR28 had between 30,000 – 50,000 trips in a day.

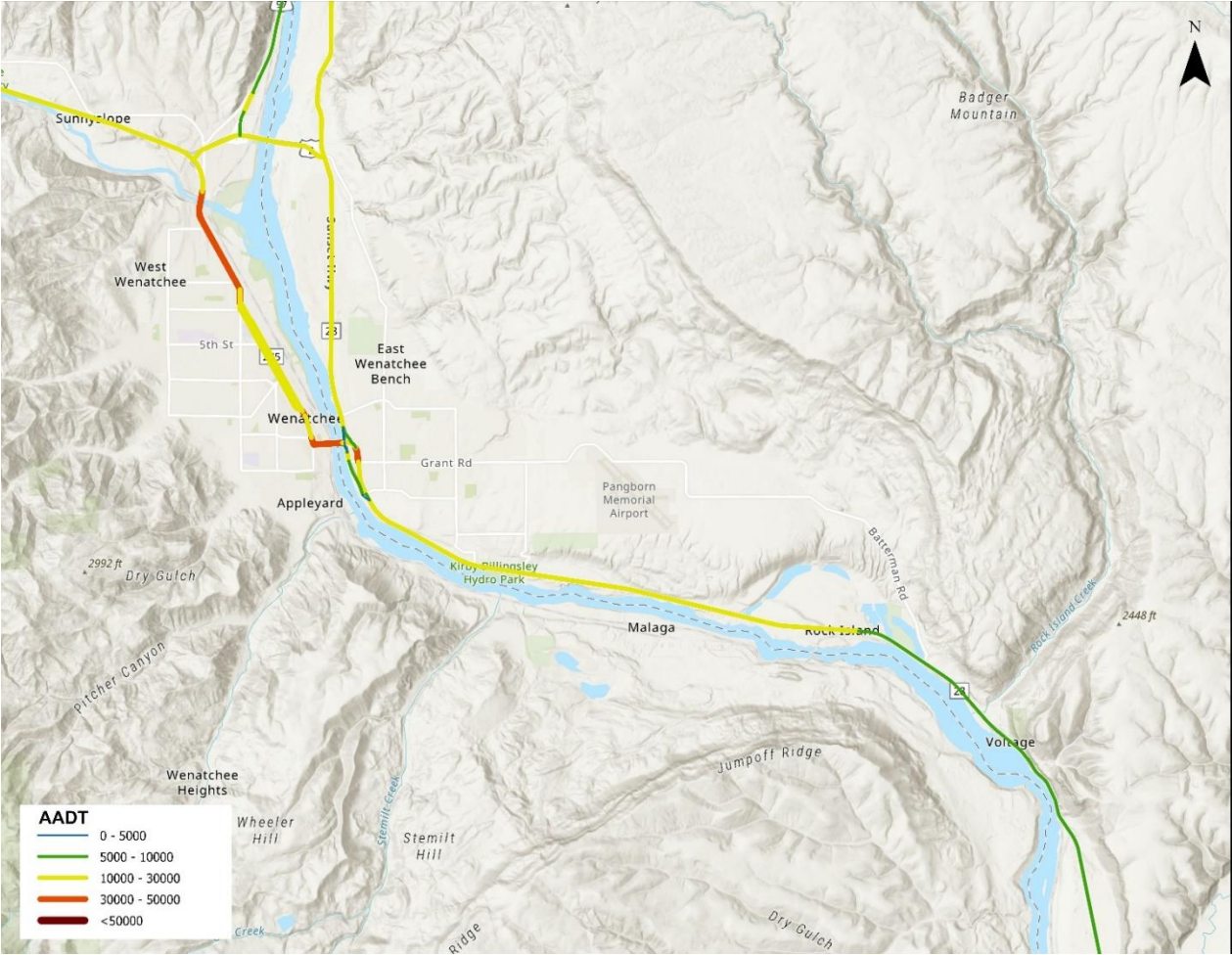


Figure 2-8: Annual Average Daily Traffic

Source: Chelan-Douglas Transportation Council

2.1.2 2050 Baseline Traffic Conditions

2050 Baseline traffic volume data (Figure 2-9) was provided by the CDTC Regional Model for both PM volumes and PM truck volumes. The 2050 CDTC model incorporates fiscally constrained network improvements and socioeconomic projections based on concurrence through the member agencies and reflects the comprehensive plans of each. The 2050 CDTC model is considered the 2050 Baseline, or no-build, model for purposes of this evaluation. The 2050 CDTC model indicates that regional traffic, traveling through Wenatchee, is using both the existing Richard Odabashian Olds Station Bridge (US 2 north crossing) and the Senator George Sellar Bridge (SR285 south crossing). The 2050 truck volumes (Figure 2-10) show a lower growth rate across both bridges than non-truck traffic.

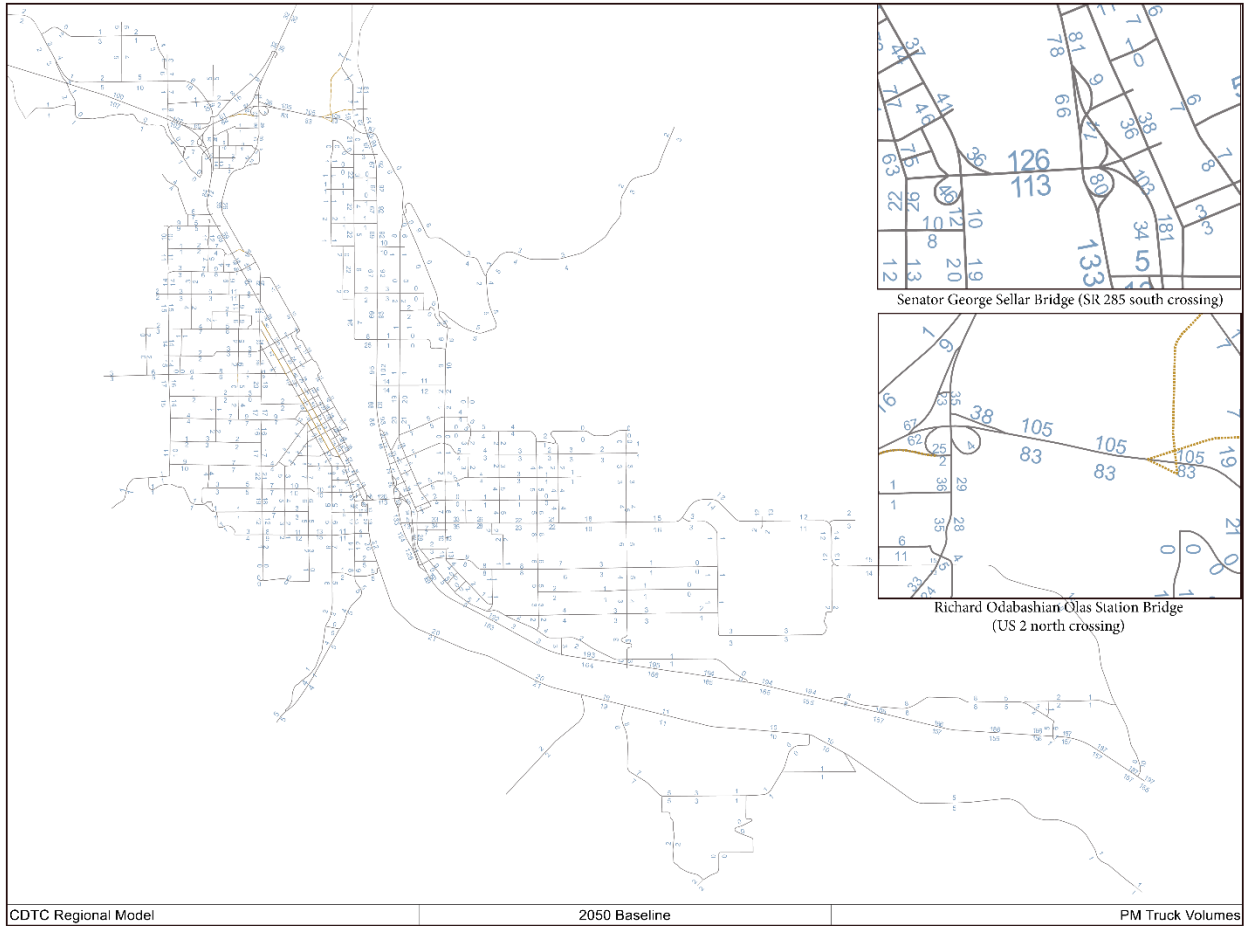


Figure 2-10: 2050 Baseline – PM Truck Volumes

Source: *Chelan-Douglas Transportation Council Travel Demand Model*

2.1.3 Active Transportation

According to the Chelan-Douglas Transportation Council's 2022 Regional Bicycle Plan, there are approximately 40 miles of on-street bikeways and 22 miles of shared use paths within the Wenatchee Valley Urban Area, which is home to nearly 60% of the population in the region. The Wenatchee Urban Area (Cities of Wenatchee and East Wenatchee) is the region's commercial, economic, and cultural center, and serve as the region's transportation hub. Feedback from the public to the 2018 Regional Bicycle Plan found that the majority of the barriers related to bicycle transportation were based on perceptions of inadequate infrastructure, facilities, and safety. Other barriers included weather, hilly terrain, and business (work, kids, pets, hobbies).

One of the focus areas of the 2022 Plan was to ensure that the bike network is planned for all ages and abilities, rather than the small percentage of bikers that feel confident riding on the streets. This requires dedicated bike lanes, wayfinding signs, and planning for current and future needs based on origin and destination information. In the 2022 Plan, 33.5 miles of bike lanes, 7 miles of shared roads, and 2 miles of shared-use paths were identified to meet the needs of the region (Figure 2-11).

Additionally, the City of Wenatchee recently secured funding for the South End Bike/Ped Access Bridges project which will provide connectivity to the Apple Capital Loop Trail by constructing bicycle/pedestrian bridges over the BNSF railroad tracks in Wenatchee, and SR28 in East Wenatchee. This will improve east-west connectivity and access to the Loop Trail; see (Figure 2-12).

There are currently three Columbia River crossings which include a separated bike/pedestrian pathway. These are the Odabashian Bridge (US 2/97), the Old Wenatchee Bridge and the Sellar Bridge (SR285).

While there are plans for extending a shared use path to Malaga and Rock Island these pathways do not yet exist. The majority of the existing active transportation network infrastructure and planning is currently focused in the more populated areas of Wenatchee and East Wenatchee.

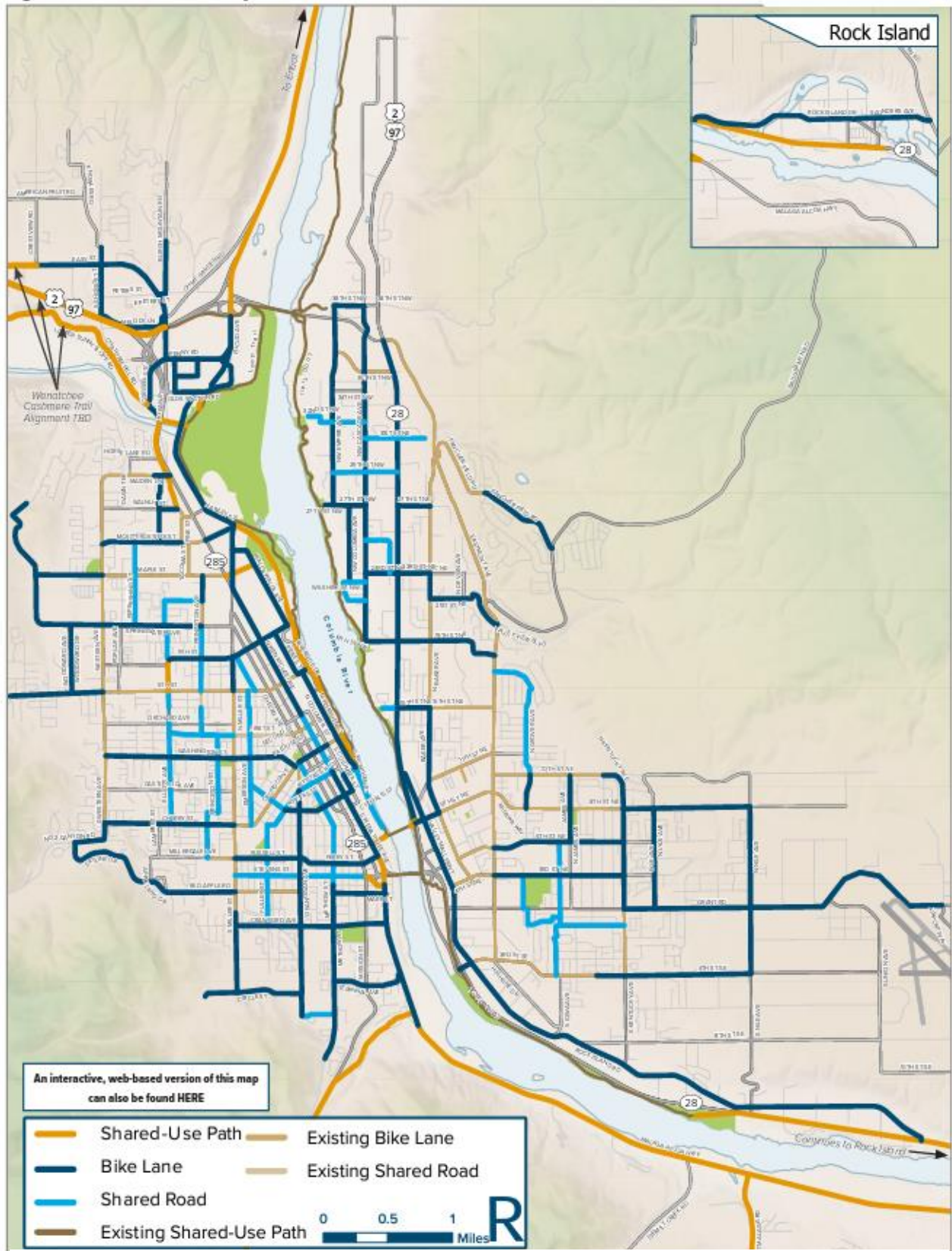


Figure 2-11: Wenatchee Valley Bike Network Recommendation.

Source: Chelan-Douglas Transportation Council Bicycle Plan

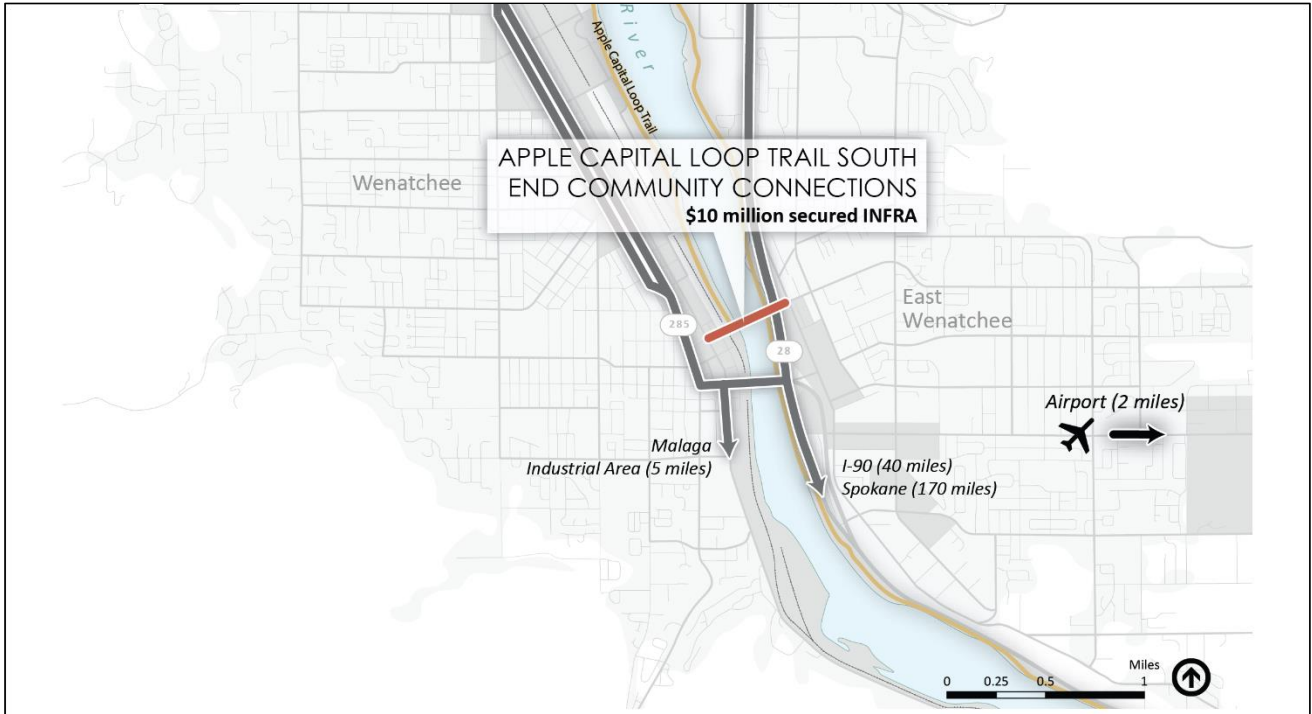


Figure 2-12: South End Bike/Ped Access Bridges.

Source: City of Wenatchee

2.1.4 Transit

The Chelan-Douglas Public Transportation Benefit Area (C-DPBTA) was created on November 21, 1989 and operates Link Transit (Link) to serve all of Chelan County and the Eastmont, Waterville, and Orondo School Districts in Douglas County. Link currently operates 18 fixed routes within the C-DPBTA and has Dial-a-Ride Transit (DART) service in the cities of Chelan and Leavenworth. All 18 routes (Figure 2-13) pass through the City of Wenatchee, which is a major destination area, and six routes pass through the City of East Wenatchee, both of which are centrally located within the C-DPBTA.

Columbia Station, located in downtown Wenatchee, has been serving as one-stop transportation hub for Link since its opening in 1997. Of the 18 fixed routes operated by Link, Route 18 is the only route that does not provide access to Columbia Station, but Route 18 continues as Route 8, which does. Six of Link's routes are intercity routes that connect Wenatchee to East Wenatchee, Manson, Leavenworth, Rock Island, Malaga, Waterville, and Cashmere, as well as cities in between. Those routes operate every 1 – 3.5 hours depending on the city and time of day, except for Leavenworth, which runs every 30 minutes during peak commute hours. Six of the routes use the Sellar Bridge to move between Wenatchee and East Wenatchee, while Routes 18 and 21 use the Odabashian Bridge in the north end of the valley.

Columbia Station also connects riders to other transportation systems such as Amtrak, which is one block east, local taxi companies, and the Wenatchee Valley Shuttle which provides service to and from SeaTac Airport. In 2023, Link Transit provided over 1.11 million passenger trips in the region, with fixed route service accounting for 1.01 million trips. Service hours are generally between 4:30am and 10:00pm Monday through Friday, 6:30am – 8:40pm (7:30am – 5:30pm in urban areas) on Saturday, and 6:30am – 8:40pm (9:30am- 5:30am) on Sunday.

In June 2022, the Link Transit's Board of Directors approved zero-fare transit service to increase ridership throughout the C-DPBTA. Link is currently delivering it's Vision 2020 promises, including a service plan developed to increase frequency, service span, and route directness throughout the region. Additionally, as highlighted in the Link's Transit Development Plan 2023-2028 and 2021 Annual Report, starting in 2024 and set to conclude in 2028, Link is conducting a *Sellar Bridge Congestion Alternatives & Transit Priority Study*. The study will evaluate transit alternatives to address congestion on the Sellar Bridge, analyzing options such as a passenger gondola, people mover technology, and/or designated transit priority.

Effective January 2, 2024

Wenatchee & East Wenatchee Routes

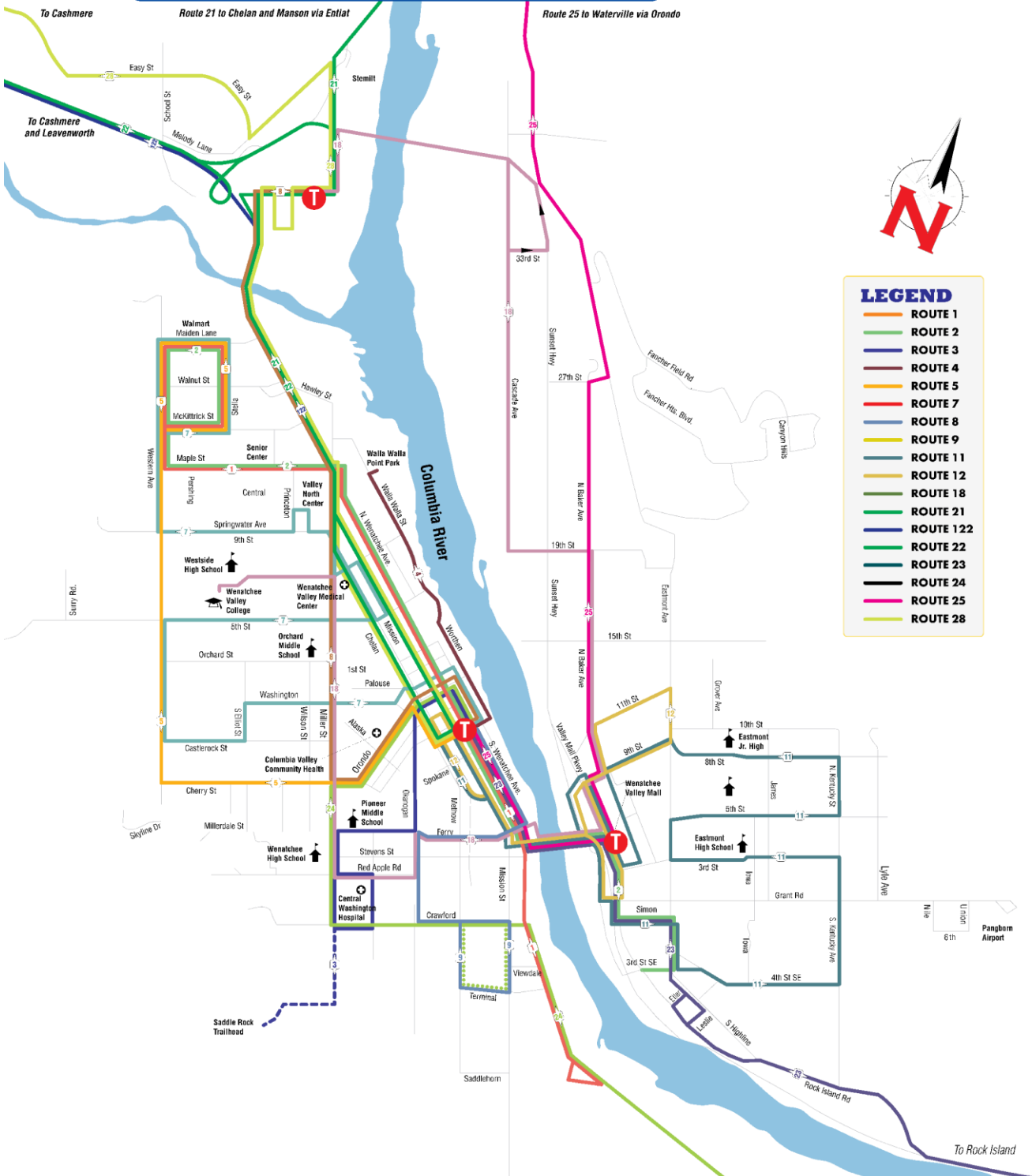


Figure 2-13: Link Transit Route Map for all routes through Wenatchee and East Wenatchee.

Source: Link Transit TDP

2.2 Structural

2.2.1 George Sellar (SR285) Bridge

The existing SR285 bridge crossing of the Columbia River (Figure 2-14) is a steel suspended tied arch style bridge which was originally constructed in 1950. Widening of this bridge type to accommodate additional travel lanes is considered infeasible for two primary reasons:

1. Widening of the existing bridge would require significant modifications to the steel superstructure as well as the concrete substructure (i.e. piers). This would likely require a full closure of the structure and significant strengthening of bridge to accommodate the heavier loads associated with a wider structure. While technically feasible, it is highly likely that the costs and disruptions associated with this type of modification would be too high to be justified.



Figure 2-14: George Sellar (SR285) Bridge

2. The existing bridge is currently listed on the National Register of Historic Places which would make significant modifications to the structure difficult to permit under the National Historic Preservation Act.

Based on these two issues, it is likely that additional traffic throughput would need to be facilitated by constructing a parallel structure and revising the channelization and ramp connections of the existing SR285 bridge accordingly.

2.3 Environmental

This section provides a high-level overview of environmental resources and conditions associated with each potential Columbia River bridge crossing location. Various publicly available online resources were utilized along with informal agency coordination efforts to obtain the baseline environmental resource conditions at each potential bridge site and are presented in the following subsections.

2.3.1 Downtown Connection Resource Considerations

The Downtown Connection bridge site is proposed as an area that can bridge the gap between the downtown areas of Wenatchee and East Wenatchee. The areas in the vicinity of the proposed bridge location are primarily developed and previously disturbed urban areas.

Sensitive Species and Habitats

Endangered Species Act Listed Species

The US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) species list (2023) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Protected Resources App (2023) were reviewed to identify any potential occurrences of Endangered Species Act (ESA) listed

species within the study area. Table 2-2 details the ESA-listed species which have the potential to occur within the vicinity of the Downtown Connection bridge site.

Table 2-2: Species Listed under the Endangered Species Act (Downtown Connection)

Species	Listing Status	Species Type	Critical Habitat
Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	Fish	Present
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Endangered	Fish	Present
Gray Wolf (<i>Canis lupus</i>)	Endangered	Mammal	Absent
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	Insect	N/A
North American Wolverine (<i>Gulo Gulo luscus</i>)	Proposed Threatened	Mammal	N/A
Steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Fish	Present
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Threatened	Bird	Absent

Essential Fish Habitat

The Downtown Connection bridge site is located within the Upper Columbia River watershed which is identified Essential Fish Habitat for Chinook and Coho Salmon under the Magnuson-Stevens Act (NOAA, 2023).

WDFW Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) list (2023) was reviewed to identify any potential occurrences of sensitive species and habitats within the study area. Additionally, the WDFW provided a list of species from the State Wildlife Action Plan, not identified in the public facing PHS website, which also qualify as PHS-listed species. Table 2-3 details the identified PHS species and habitats which have the potential to occur within the vicinity of the Downtown Connection bridge site.

Table 2-3: WDFW Priority Habitats and Species (Downtown Connection)

Species	State/Federal Status	Species Type	Sensitive Location
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	None	Bird	No
Bull Trout (<i>Salvelinus confluentus</i>)	Federal - Threatened	Fish	No
Burrowing Owl (<i>Athene cunicularia</i>)	State - Candidate	Bird	No
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Federal - Endangered	Fish	ESA Critical Habitat
Coho Salmon (<i>Oncorhynchus kisutch</i>)	None	Fish	No
Common Loon (<i>Gavia immer</i>)	State - Sensitive	Bird	No
Dolly Varden (<i>Salvelinus malma</i>)	None	Fish	No
Kokanee (<i>Oncorhynchus nerka</i>)	None	Fish	No
Golden Eagle (<i>Aquila chrysaetos</i>)	State - Candidate	Bird	Yes
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	State - Endangered	Bird	No
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	State - Candidate	Bird	No
Mule Deer (<i>Odocoileus hemionus</i>)	None	Mammal	No
Night Snake (<i>Hypsiglena torquata</i>)	None	Reptile	No

Species	State/Federal Status	Species Type	Sensitive Location
Northern Sagebrush Lizard (<i>Sceloporus graciosus</i>)	State - Candidate	Reptile	No
Peregrine Falcon (<i>Falco peregrinus</i>)	None	Bird	No
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	None	Bird	No
Pygmy Short-horned Lizard (<i>Phrynosoma douglasii</i>)	None	Reptile	No
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	None	Fish	No
Sage Thrasher (<i>Oreoscoptes montanus</i>)	State - Candidate	Bird	No
Steelhead (<i>Oncorhynchus mykiss</i>)	Federal - Threatened	Fish	ESA Critical Habitat
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	None	Fish	No
White Sturgeon (<i>Acipenser transmontanus</i>)	None	Fish	No
White-headed Woodpecker (<i>Dryobates albolarvatus</i>)	State - Candidate	Bird	No
Wood Duck (<i>Aix sponsa</i>)	None	Bird	No
Habitat Feature	State/Federal Status		Sensitive Location
Shrubsteppe	None		No

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) was reviewed to identify any potential occurrences of bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protect Act within the study area. Table 2-4 details the identified bird species which have the potential to occur within the vicinity of the Downtown Connection bridge site.

Table 2-4: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (Downtown Connection)

Species	Breeding Season
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Apr 1 to Aug 31
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Dec 1 to Aug 31
Black Swift (<i>Cypseloides niger</i>)	Jun 15 to Sep 10
Black Tern (<i>Chlidonias niger</i>)	May 15 to Aug 20
California Gull (<i>Larus californicus</i>)	Mar 1 to Jul 31
Cassin's Finch (<i>Carpodacus cassinii</i>)	May 15 to Jul 15
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	May 15 to Aug 10
Franklin's Gull (<i>Leucophaeus pipixcan</i>)	May 1 to Jul 31
Golden Eagle (<i>Aquila chrysaetos</i>)	Jan 1 to Aug 31
Lesser Yellowlegs (<i>Tringa flavipes</i>)	N/A - Breeds Elsewhere
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Apr 20 to Sep 30
Long-eared Owl (<i>Asio otus</i>)	Mar 1 to Jul 15
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	May 20 to Aug 31

Species	Breeding Season
Rufous Hummingbird (<i>Selasphorus rufus</i>)	Apr 15 to Jul 15
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Apr 15 to Aug 10
Western Grebe (<i>Aechmophorus occidentalis</i>)	Jun 1 to Aug 31

Aquatic Resources

The National Wetland Inventory (NWI) Mapper tool was utilized to identify aquatic resources within the vicinity of the Downtown Connection bridge site. Aquatic resources identified within the vicinity included the Columbia River and riverine stream features on both sides of the river (see Appendix B for the NWI Map). Both features on either side of the river terminate at the Columbia River, approximately at the location where the Old Wenatchee Bridge meets the riverbank to the south. Within the Downtown Connection bridge location, the width of the Columbia River is estimated to range from approximately 1,400 to 1,800 feet from the Ordinary High Water Mark (OHWM). There are no existing structures crossing the Columbia River at the Downtown bridge site.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the area depict the narrow low lying shoreline area along the Columbia River as Zone A and is considered within the 100 year flood area with a 1% annual chance of flooding. The upslope developed areas of Wenatchee and East Wenatchee at this location are depicted as Zone X and considered outside of the 100 year flood area with a greater than 1% annual chance of flooding (see Appendix B for the FEMA FIRM Mapping).

Cultural Resources

To determine the likelihood of cultural resources being present at the Downtown Connection bridge site or within the immediate vicinity, Washington Department of Archaeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archeological Records Data (WISAARD) Mapping tool (2023) was reviewed for the study area. The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the Downtown Connection bridge site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present.

Additionally, the Downtown Wenatchee Historic District, which is listed in the National Register of Historic Places (NRHP) and the Washington Heritage Register, is located northwest of the study area, approximately 1,100 feet to the northwest of the intersection of Spokane St and Wenatchee Ave. Also listed on the Washington Heritage Register is St. Joseph Church and Rectory, approximately 750 ft southwest of the intersection of Spokane St and Wenatchee Ave. The Columbia River Bridge south of the conceptual crossing is also listed on both the NRHP and Washington Heritage Registry.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Downtown Connection bridge site. The site is predominantly located in Douglas County (Census Tract 9505) and Chelan County (Census Tract 9610.02). Table 2-5 details the socioeconomic data for the census tracts in the area compared to Douglas and Chelan Counties, as well as the National averages. Land uses in the vicinity of the proposed bridge alignment consist of commercial and industrial uses.

Table 2-5: Downtown Connection, 2021 Census Data

Characteristics	BG 3, Tract 9505, Douglas, WA	BG 1, Tract 9505, Douglas, WA	BG 1, Tract 9610.02, Chelan, WA	Douglas County, WA	Chelan County, WA	U.S. Average or Value
Population Demographics						
Total Population	327	1,698	841	42,622	79,646	331,893,760
Male	35.5%	51.7%	32.7%	51.0%	48.9%	50.0%
Female	64.5%	48.3%	67.3%	49.0%	51.1%	50.0%
Median Age	28.4	32.1	25.0	37.5	39.3	38.8
Race						
White	39%	63%	35%	62%	66%	58.0%
Hispanic	55%	30%	58%	33%	29%	19.0%
Other	6%	7%	6%	1%	3%	23.0%
Households						
Number of Households	135	668	387	15,278	32,050	127,544,730
Persons per Household	2.4	2.5	2.2	2.8	2.5	2.5
Education						
High School Graduate or Higher	58.7%	88.5%	80.1%	82.1%	86.5%	89.4%
Bachelor's Degree or Higher	4.3%	17.8%	15.9%	21.2%	34.1%	35.0%
Economic Status						
In Labor Force	-	-	-	-	-	64.1%
Median Household Income (2021)	\$53,527	\$54,211	\$34,135	\$68,979	\$65,847	\$69,717
Per Capita Income	\$25,308	\$24,341	\$15,705	\$35,094	\$43,694	\$38,332
Families below Poverty Level	-	-	-	9.7%	10.2%	12.8%

Soils and Farmland Classification

Soils information and associated farmland classifications for the Downtown Connection bridge site was obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey. Table 2-6 details the types of soils and their respective farmland classification within the site location (see Appendix B for the NRCS Web Soil Survey).

The location contains soils that are considered Prime farmland, Farmland of statewide importance, and Farmland of unique importance. However, much of the land areas considered to be farmland by NRCS Web Soil Survey are highly disturbed and developed.

Table 2-6: Soil Types and Farmland Classifications (Downtown Connection)

Soil Map Unit Name	Map Unit Symbol	Farmland Classification
Chelan County		
Cashmont sandy loam, 3 to 8 percent slopes	CcB	Prime farmland if irrigated
Peshastin stony loam, 0 to 25 percent slopes	PID	Farmland of unique importance
Douglas County		
Cashmere fine sandy loam, 3 to 8 percent slopes	80	Farmland of statewide importance
Pogue extremely stone fine sand loam, 3 to 25 percent slopes	268	Farmland of unique importance
Torriorthents, very steep	427	Not prime farmland

Sensitive Lands

Much of the land on either side of the river at the Downtown Connection bridge site primarily consists of highly developed urban areas. Old Wenatchee Bridge crosses the Columbia River to the south of the Downtown Connection bridge site study area.

The Land and Water Conservation Fund mapping tool (2023) was utilized to locate any previously federally funded project locations in the vicinity of the proposed site. Hale Park, located on the west bank of the Columbia River and to the south of the downtown site, was identified as a park that had received federal funding in the past. Wenatchee Riverfront Park and Walla Walla Point Park occur north of the Downtown Connection site along the west bank of the Columbia River and were identified as areas of concern by Chelan County PUD during informal coordination. The Apple Capital Recreation Loop Trail parallels the east and west bank of the Columbia River within the Downtown Connection bridge site study area. All of the aforementioned recreation areas (Figure 2-15) require consideration under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303).

Apple Capital Recreation Loop Trail



Figure 2-15: Recreation Areas

Source: Chelan PUD

2.3.2 SR285 Expansion Resource Considerations

The State Route (SR) 285 Expansion bridge site is an existing bridge crossing location that would be expanded to accommodate additional lanes and traffic along its route. The areas in the vicinity of the proposed bridge location are primarily developed and previously disturbed urban areas.

Sensitive Species and Habitats

Endangered Species Act Listed Species

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) were reviewed to identify any potential occurrences of ESA-listed species within the study area. Table 2-7 details the ESA-listed species which have the potential to occur within the vicinity of the SR285 Expansion bridge site.

Table 2-7: Species Listed under the Endangered Species Act (SR285 Expansion)

Species	Listing Status	Species Type	Critical Habitat
Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	Fish	Present
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Endangered	Fish	Present
Gray Wolf (<i>Canis lupus</i>)	Endangered	Mammal	Absent
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	Insect	N/A
North American Wolverine (<i>Gulo luscus</i>)	Proposed Threatened	Mammal	N/A
Steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Fish	Present
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Threatened	Bird	Absent

Essential Fish Habitat

The SR285 bridge site is located within the Upper Columbia River watershed which is identified Essential Fish Habitat for Chinook and Coho Salmon under the Magnuson-Stevens Act (NOAA, 2023).

WDFW Priority Habitats and Species

The WDFW PHS list (2023) was reviewed to identify any potential occurrences of sensitive species and habitats within the study area. Additionally, the WDFW provided a list of species from the State Wildlife Action Plan, not identified in the public facing PHS website, which also qualify as PHS-listed species. Table 2-8 details the identified PHS species and habitats which have the potential to occur within the vicinity of the SR285 Expansion bridge site.

Table 2-8: WDFW Priority Habitats and Species (SR285 Expansion)

Species	State/Federal Status	Species Type	Sensitive Location
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	None	Bird	No
Bull Trout (<i>Salvelinus confluentus</i>)	Federal - Threatened	Fish	No
Burrowing Owl (<i>Athene cunicularia</i>)	State - Candidate	Bird	No
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Federal - Endangered	Fish	ESA Critical Habitat
Coho Salmon (<i>Oncorhynchus kisutch</i>)	None	Fish	No

Species	State/Federal Status	Species Type	Sensitive Location
Common Loon (<i>Gavia immer</i>)	State - Sensitive	Bird	No
Dolly Varden (<i>Salvelinus malma</i>)	None	Fish	No
Kokanee (<i>Oncorhynchus nerka</i>)	None	Fish	No
Golden Eagle (<i>Aquila chrysaetos</i>)	State - Candidate	Bird	Yes
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	State - Endangered	Bird	No
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	State - Candidate	Bird	No
Mule Deer (<i>Odocoileus hemionus</i>)	None	Mammal	No
Night Snake (<i>Hypsiglena torquata</i>)	None	Reptile	No
Northern Sagebrush Lizard (<i>Sceloporus graciosus</i>)	State - Candidate	Reptile	No
Peregrine Falcon (<i>Falco peregrinus</i>)	None	Bird	No
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	None	Bird	No
Pygmy Short-horned Lizard (<i>Phrynosoma douglasii</i>)	None	Reptile	No
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	None	Fish	No
Sage thrasher (<i>Oreoscoptes montanus</i>)	State - Candidate	Bird	No
Steelhead (<i>Oncorhynchus mykiss</i>)	Federal - Threatened	Fish	ESA Critical Habitat
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	None	Fish	No
White-headed Woodpecker (<i>Dryobates albolarvatus</i>)	State - Candidate	Bird	No
White Sturgeon (<i>Acipenser transmontanus</i>)	None	Fish	No

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) was reviewed to identify any potential occurrences of bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protect Act within the study area. Table 2-9 details the identified bird species which have the potential to occur within the vicinity of the SR285 Expansion bridge site.

Table 2-9: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (SR285 Expansion)

Species	Breeding Season
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Apr 1 to Aug 31
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Dec 1 to Aug 31
California Gull (<i>Larus californicus</i>)	Mar 1 to Jul 31
Cassin's Finch (<i>Carpodacus cassinii</i>)	May 15 to Jul 15
Golden Eagle (<i>Aquila chrysaetos</i>)	Jan 1 to Aug 31
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Apr 20 to Sep 30
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Apr 15 to Aug 10
Western Grebe (<i>Aechmophorus occidentalis</i>)	Jun 1 to Aug 31

Aquatic Resources

The National Wetland Inventory (NWI) Mapper tool was utilized to identify aquatic resources within the vicinity of the SR285 Expansion bridge site. Aquatic resources identified within the vicinity included the Columbia River and a riverine stream feature on the east side of the river. The feature terminates at the Columbia River, approximately at the location where the current bridge alignment meets the riverbank (see Appendix B for the NWI Map). This feature is mapped on DNR Maps as an X-Type (non-typed per WAC 222-16) stream (see Appendix B for the DNR Map). The current bridge crossing at the SR285 expansion site currently spans approximately 1,000 feet across the Columbia River.

The FEMA FIRM maps for the area depict the nearshore areas around the existing bridge connections on either side of the river as areas of Zone X and Zone B which are considered outside of the 100-year flood area with a greater than 1% annual chance of flooding (see Appendix B for the FEMA FIRM Mapping).

Cultural Resources

To determine the likelihood of cultural resources being present at the SR285 Expansion bridge site or within the immediate vicinity, the DAHP WISAARD Mapping tool (2023) was reviewed for the study area. The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the SR285 Expansion bridge site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool also identifies that the existing SR285 bridge structure, referred to as the Columbia River Bridge – Stevens St (SR285 Crossing), is listed on the National Register of Historic Places (NRHP) and Washington Heritage Register.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the SR285 Site. The site is located at the nexus of four census tracts in Douglas County (Census Tracts 9505 & 9508) and Chelan County (Census Tracts 9611.02 & 9610.02). Table 2-10 details the socioeconomic data for the census tracts in the area compared to Douglas and Chelan Counties, as well as the National averages.

Table 2-10: SR285 Location, 2021 Census Data

Characteristics	BG 3, Tract 9505, Douglas, WA	BG 3, Tract 9508, Douglas, WA	BG 1, Tract 9610.02, Chelan, WA	BG 4, Tract 9611.02, Chelan, WA	Douglas County, WA	Chelan County, WA	U.S. Average or Value
Population Demographics							
Total Population	327	2,931	841	661	42,622	79,646	331,893,760
Male	35.5%	49.2%	32.7%	39.2%	51.0%	48.9%	50.0%
Female	64.5%	50.8%	67.3%	60.8%	49.0%	51.1%	50.0%
Median Age	28.4	34.5	25.0	30.2	37.5	39.3	38.8
Race							
White	39%	55%	35%	15%	62%	66%	58.0%
Hispanic	55%	43%	58%	75%	33%	29%	19.0%
Other	6%	2%	6%	-	1%	3%	23.0%

Characteristics	BG 3, Tract 9505, Douglas, WA	BG 3, Tract 9508, Douglas, WA	BG 1, Tract 9610.02, Chelan, WA	BG 4, Tract 9611.02, Chelan, WA	Douglas County, WA	Chelan County, WA	U.S. Average or Value
Households							
Number of Households	135	903	387	252	15,278	32,050	127,544,730
Persons per Household	2.4	3.2	2.2	2.6	2.8	2.5	2.5
Education							
High School Graduate or Higher	58.7%	70.4%	80.1%	55.7%	82.1%	86.5%	89.4%
Bachelor's Degree or Higher	4.3%	12.3%	15.9%	-	21.2%	34.1%	35.0%
Economic Status							
In Labor Force	-	-	-	-	-	-	64.1%
Median Household Income (2021)	\$53,527	\$64,349	\$34,135	\$47,273	\$68,979	\$65,847	\$69,717
Per Capita Income	\$25,308	\$24,688	\$15,705	\$19,794	\$35,094	\$43,694	\$38,332
Families below Poverty Level	-	-	-	-	9.7%	10.2%	12.8%

Soils and Farmland Classification

Soils information and associated farmland classifications for the SR285 Expansion bridge site was obtained from the NRCS Web Soil Survey. Table 2-11 details the types of soils and their respective farmland classification within the site location (see Appendix B for the NRCS Web Soil Survey).

The location contains soils that are considered Farmland of unique importance. However, much of the land areas considered to be farmland by NRCS Web Soil Survey are highly disturbed and developed.

Table 2-11: Soil Types and Farmland Classifications (SR285 Expansion)

Soil Map Unit Name	Map Unit Symbol	Farmland Classification
Chelan County		
Peshastin stony loam, 25 to 45 percent slopes	PIE	Not prime farmland
Peshastin stony loam, 0 to 25 percent slopes	PID	Farmland of unique importance
Douglas County		
Pogue cobbly fine sandy loam, 0 to 15 percent slopes	266	Farmland of unique importance
Pogue extremely stone fine sand loam, 3 to 25 percent slopes	268	Farmland of unique importance
Torriorthents, very steep	427	Not prime farmland

Sensitive Lands

Majority of the land on either side of the river at the SR285 Expansion site primarily consists of highly developed urban areas. The Land and Water Conservation Fund mapping tool was utilized to locate any previously federally funded project locations in the vicinity of the proposed site. Hale Park, located on the west bank of the Columbia River and to the north of the SR285 Expansion site, was identified as a park that had received federal funding in the past. The Apple Capital Recreation Loop Trail parallels the east bank of the Columbia River within the SR285 Expansion bridge site study area. Two parks (Mission St Park and Train Park) are located on the western side of the river, located on the north and south sides of SR285/Stevens St. Each recreation area (Figure 2-11) requires consideration under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303).

2.3.3 Mid-Valley Connection

The Mid-Valley Connection bridge site is located to the east of Hydro Park. The site has a lower level of development than the Downtown Connection and SR285 Expansion site, though more developed than the Rock Island Dam site. The site is primarily comprised of undeveloped land and existing roadway, with neighboring agricultural and residential lands.

Sensitive Species and Habitats

Endangered Species Act Listed Species

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) were reviewed to identify any potential occurrences of ESA-listed species within the study area. Table 2-12 details the ESA-listed species which have the potential to occur within the vicinity of the Mid-Valley Connection bridge site.

Table 2-12: Species Listed under the Endangered Species Act (Mid-Valley Connection)

Species	Listing Status	Species Type	Critical Habitat
Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	Fish	Present
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Endangered	Fish	Present
Gray Wolf (<i>Canis lupus</i>)	Endangered	Mammal	Absent
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	Insect	N/A
North American Wolverine (<i>Gulo Gulo luscus</i>)	Proposed Threatened	Mammal	N/A
Steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Fish	Present
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Threatened	Bird	Absent

Essential Fish Habitat

The Mid-Valley Connection bridge site is located within the Upper Columbia River watershed which is identified Essential Fish Habitat for Chinook and Coho Salmon under the Magnuson-Stevens Act (NOAA, 2023).

WDFW Priority Habitats and Species

The WDFW PHS list (2023) was reviewed to identify any potential occurrences sensitive species and habitats within the study area. Additionally, the WDFW provided a list of species from the State Wildlife Action Plan, not identified in the public facing PHS website, which also qualify as PHS-listed species. Table 2-13 details the identified PHS species and habitats which have the potential to occur within the vicinity of the Mid-Valley Connection bridge site.

Table 2-13: WDFW Priority Habitats and Species (Mid-Valley Connection)

Species	State/Federal Status	Species Type	Sensitive Location
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	None	Bird	No
Bull Trout (<i>Salvelinus confluentus</i>)	Federal - Threatened	Fish	ESA Critical Habitat
Burrowing Owl (<i>Athene cunicularia</i>)	State - Candidate	Bird	No
Cavity-nesting ducks	None	Bird	No
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Federal - Endangered	Fish	ESA Critical Habitat
Chukar (<i>Alectoris chukar</i>)	None	Bird	No
Coho Salmon (<i>Oncorhynchus kisutch</i>)	None	Fish	No
Common Loon (<i>Gavia immer</i>)	State - Sensitive	Bird	No
Dolly Varden (<i>Salvelinus malma</i>)	None	Fish	No
Kokanee (<i>Oncorhynchus nerka</i>)	None	Fish	No
Golden Eagle (<i>Aquila chrysaetos</i>)	State - Candidate	Bird	Yes
Great Blue Heron (<i>Ardea Herodias</i>)	None	Bird	No
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	State - Endangered	Bird	No
Mule Deer (<i>Odocoileus hemionus</i>)	None	Mammal	No
Night Snake (<i>Hypsiglena torquata</i>)	None	Reptile	No
Northern Sagebrush Lizard (<i>Sceloporus graciosus</i>)	State - Candidate	Reptile	No
Peregrine Falcon (<i>Falco peregrinus</i>)	None	Bird	No
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	None	Bird	No
Pygmy Short-horned Lizard (<i>Phrynosoma douglasii</i>)	None	Reptile	No
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	None	Fish	No
Sage Thrasher (<i>Oreoscoptes montanus</i>)	State - Candidate	Bird	No
Steelhead (<i>Oncorhynchus mykiss</i>)	Federal - Threatened	Fish	ESA Critical Habitat
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	None	Fish	No
Waterfowl Concentrations	N/A	Bird	No
White Sturgeon (<i>Acipenser transmontanus</i>)	None	Fish	No
White-headed Woodpecker (<i>Dryobates albolarvatus</i>)	State - Candidate	Bird	No
Wood duck	None	Bird	No
Species	State/Federal Status		Sensitive Location
Freshwater Forested/Shrub Wetland	None		No

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) was reviewed to identify any potential occurrences of bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protect Act within the study area. Table 2-14 details the identified bird species which have the potential to occur within the vicinity of the Mid-Valley Connection bridge site.

Table 2-14: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (Mid-Valley Connection)

Species	Breeding Season
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Apr 1 to Aug 31
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Dec 1 to Aug 31
Black Swift (<i>Cypseloides niger</i>)	Jun 15 to Sep 10
Black Tern (<i>Chlidonias niger</i>)	May 15 to Aug 20
California Gull (<i>Larus californicus</i>)	Mar 1 to Jul 31
Cassin's Finch (<i>Carpodacus cassinii</i>)	May 15 to Jul 15
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	May 15 to Aug 10
Franklin's Gull (<i>Leucophaeus pipixcan</i>)	May 1 to Jul 31
Golden Eagle (<i>Aquila chrysaetos</i>)	Jan 1 to Aug 31
Lesser Yellowlegs (<i>Tringa flavipes</i>)	N/A - Breeds Elsewhere
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Apr 20 to Sep 30
Long-eared Owl (<i>Asio otus</i>)	Mar 1 to Jul 15
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	May 20 to Aug 31
Rufous Hummingbird (<i>Selasphorus rufus</i>)	Apr 15 to Jul 15
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Apr 15 to Aug 10
Western Grebe (<i>Aechmophorus occidentalis</i>)	Jun 1 to Aug 31

Aquatic Resources

There is one riverine stream features mapped on the National Wetland Inventory (NWI) map in the vicinity of the Mid-Valley Connection bridge site, which occurs on the south side of the river that terminates at the Columbia River through an off-channel portion of the river. Additionally, there is one Freshwater Emergent Wetland feature shown on the south side of the river, on the southeast of the intersection of Malaga Rd and Malaga-Alcoa Hwy (see Appendix B for the NWI Map). According to the Washington Department of Natural Resources Forest Practices Application Mapping Tool, the features associated with the riverine and off channel feature area mapped as a Type-N stream that is disconnected from the Columbia River by the Malaga-Alcoa Hwy (see Appendix B for the DNR Water Type Map). The width of the Columbia River is estimated to range from approximately 1,180-1,320 feet in the vicinity of the bridge site.

The FEMA FIRM for the area does not indicate any flood zone areas outside of the Columbia River within the Mid-Valley Connection bridge site study area.

Cultural Resources

To determine the likelihood of cultural resources being present at the Mid-Valley Connection bridge site or within the immediate vicinity, the DAHP WISAARD Mapping tool (2023) was reviewed for the study area. The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the Mid-Valley Area crossing site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool did not identify any structures listed or eligible to be listed on the NHRP and the Washington Heritage Register.

Socioeconomic

The United States Census Bureau (2023) and EPA’s Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Mid-Valley Connection bridge site. The site is predominantly located in both Douglas County (Census Tract 9503) and Chelan County (Census Tract 9612). Table 2-15 details the socioeconomic data for the census tracts in the area compared to Douglas and Chelan Counties, as well as the National averages.

During informal coordination, Chelan PUD also indicated that the Mid-Valley Connection bridge site study area on the southern side of the Columbia River has the potential to contain significant historic properties not identified within the publicly accessible WISSARD database.

Table 2-15: Mid-Valley Connection Location, 2021 Census Data

Characteristics	BG 2, Tract 9503, Douglas, WA	BG 4, Tract 9503, Douglas, WA	BG 1, Tract 9612, Chelan, WA	Douglas County, WA	Chelan County, WA	U.S. Average or Value
Population Demographics						
Total Population	1,315	1,914	1,535	42,622	79,646	331,893,760
Male	50.0%	46.0%	54.0%	51.0%	48.9%	50.0%
Female	50%	54.0%	46.0%	49.0%	51.1%	50.0%
Median Age	48.5	37.9	36.3	37.5	39.3	38.8
Race						
White	53%	68%	68%	62%	66%	58.0%
Hispanic	41%	21%	26%	33%	29%	19.0%
Other	6%	11%	6%	1%	3%	23.0%
Households						
Number of Households	469	617	574	15,278	32,050	127,544,730
Persons per Household	2.8	3.1	2.6	2.8	2.5	2.5
Education						
High School Graduate or Higher	79.1%	87.6%	89.3%	82.1%	86.5%	89.4%
Bachelor’s Degree or Higher	14.2%	27.4%	22.7%	21.2%	34.1%	35.0%
Economic Status						
Median Household Income (2021)	-	\$66,550	\$101,154	\$68,979	\$65,847	\$69,717
Per Capita Income	\$29,071	\$47,666	\$39,443	\$35,094	\$43,694	\$38,332
Families below Poverty Level	-	-	-	9.7%	10.2%	12.8%

Soils and Farmland Classification

Soils information and associated farmland classifications for the Mid-Valley Connection bridge site was obtained from the NRCS Web Soil Survey. Table 2-16 details the types of soils and their respective locations within the site location (see Appendix B for the NRCS Web Soil Survey). The location contains soils that are considered Prime farmland if irrigated, Farmland of statewide importance, and Farmland of unique importance.

Table 2-16: Soil Types and Farmland Classifications (Mid-Valley Connection)

Soil Map Unit Name	Map Unit Symbol	Farmland Classification
Chelan County		
Alluvial land	Ad	Prime farmland if irrigated
Burch fine sandy loam, 8 to 15 percent slopes	BuC	Farmland of unique importance
Cashmont stony sandy loam, 0 to 25 percent slopes	CeD	Farmland of unique importance
Colockum silt loam, 8 to 15 percent slopes	CrC	Farmland of unique importance
Colockum silt loam, 15 to 25 percent slopes	CrD	Farmland of unique importance
Pogue gravelly fine sandy loam, 3 to 8 percent slopes	PrB	Prime farmland if irrigated
Terrace escarpments	Te	Not prime farmland
Wenatchee silt loam, 3 to 8 percent slopes	WeB	Farmland of statewide importance
Douglas County		
Cashmont gravelly sandy loam, 8 to 15 percent slopes	88	Farmland of unique importance
Logy cobbly sandy loam, 3 to 15 percent slopes	222	Not prime farmland
Pogue fine sandy loam, 0 to 3 percent slopes	261	Prime farmland if irrigated
Pogue fine sandy loam, 3 to 8 percent slopes	262	Prime farmland if irrigated
Pogue gravelly fine sandy loam, 8 to 15 percent slopes	264	Farmland of unique importance
Pogue cobbly fine sandy loam, 0 to 15 percent slopes	266	Farmland of unique importance
Pogue extremely stony fine sandy loam, 3 to 25 percent slopes	268	Farmland of unique importance
Quincy loamy fine sand, 0 to 15 percent slopes	274	Not prime farmland
Torriorthents, very steep	427	Not prime farmland

Sensitive Lands

The land in the vicinity of the Mid-Valley Connection Bridge site is a combination of undeveloped, residential, and agricultural land. The Land and Water Conservation Fund mapping tool (2023) was utilized to identify any previously federally funded project locations in the vicinity of the proposed site. No previously federally funded projects were located in the vicinity of the proposed site. The Apple Capital

Recreation Loop Trail terminates on the east bank of the Columbia River, within Hydro Park, located approximately 0.37 miles to the west of the proposed bridge study area. All of the aforementioned recreation areas (Figure 2-15) require consideration under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303).

2.3.4 Malaga/Rock Island Industrial Area Crossing Resource Considerations

The Malaga/Rock Island Industrial Area crossing site is located south of the City of the Rock Island. The site has a lower level of development than the Downtown Connection and SR285 Expansion site. The site is primarily comprised of industrial development and undeveloped land areas.

Sensitive Species and Habitats

Endangered Species Act Listed Species

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) were reviewed to identify any potential occurrences of ESA-listed species within the study area. Table 2-12 details the ESA-listed species which have the potential to occur within the vicinity of the Malaga Area crossing site.

Table 2-12: Species Listed under the Endangered Species Act (Malaga)

Species	Listing Status	Species Type	Critical Habitat
Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	Fish	Present
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Endangered	Fish	Present
Gray Wolf (<i>Canis lupus</i>)	Endangered	Mammal	Absent
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	Insect	N/A
North American Wolverine (<i>Gulo Gulo luscus</i>)	Proposed Threatened	Mammal	N/A
Steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Fish	Present
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Threatened	Bird	Absent

Essential Fish Habitat

The Malaga Area crossing site is located within the Upper Columbia River watershed which is identified Essential Fish Habitat for Chinook and Coho Salmon under the Magnuson-Stevens Act (NOAA, 2023).

WDFW Priority Habitats and Species

The WDFW PHS list (2023) was reviewed to identify any potential occurrences sensitive species and habitats within the study area. Additionally, the WDFW provided a list of species from the State Wildlife Action Plan, not identified in the public facing PHS website, which also qualify as PHS-listed species. Table 2-13 details the identified PHS species and habitats which have the potential to occur within the vicinity of the Malaga/Rock Island Industrial Area crossing site.

Table 2-13: WDFW Priority Habitats and Species (Malaga/Rock Island Industrial Area)

Species	State/Federal Status	Species Type	Sensitive Location
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	None	Bird	No
Bull Trout (<i>Salvelinus confluentus</i>)	Federal - Threatened	Fish	No
Burrowing Owl (<i>Athene cunicularia</i>)	State - Candidate	Bird	No
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Federal - Endangered	Fish	ESA Critical Habitat
Chukar (<i>Alectoris chukar</i>)	None	Bird	No
Coho Salmon (<i>Oncorhynchus kisutch</i>)	None	Fish	No
Common Loon (<i>Gavia immer</i>)	State - Sensitive	Bird	No
Dolly Varden (<i>Salvelinus malma</i>)	None	Fish	No
Kokanee (<i>Oncorhynchus nerka</i>)	None	Fish	No
Golden Eagle (<i>Aquila chrysaetos</i>)	State - Candidate	Bird	Yes
Great Blue Heron (<i>Ardea Herodias</i>)	None	Bird	No
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	State - Endangered	Bird	No
Mule Deer (<i>Odocoileus hemionus</i>)	None	Mammal	No
Night Snake (<i>Hypsiglena torquata</i>)	None	Reptile	No
Northern Sagebrush Lizard (<i>Sceloporus graciosus</i>)	State - Candidate	Reptile	No
Peregrine Falcon (<i>Falco peregrinus</i>)	None	Bird	No
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	None	Bird	No
Pygmy Short-horned Lizard (<i>Phrynosoma douglasii</i>)	None	Reptile	No
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	None	Fish	No
Sage Thrasher (<i>Oreoscoptes montanus</i>)	State - Candidate	Bird	No
Steelhead (<i>Oncorhynchus mykiss</i>)	Federal - Threatened	Fish	ESA Critical Habitat
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	None	Fish	No
Waterfowl Concentrations	N/A	Bird	No
White Sturgeon (<i>Acipenser transmontanus</i>)	None	Fish	No
White-headed Woodpecker (<i>Dryobates albolarvatus</i>)	State - Candidate	Bird	No
Species	State/Federal Status		Sensitive Location
Biodiversity Areas and Corridor	None		No
Cliffs/bluffs	None		No
Shrubsteppe	None		No

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) was reviewed to identify any potential occurrences of bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protect Act within the study area. Table 2-14 details the identified bird species which have the potential to occur within the vicinity of the Malaga Area crossing site.

Table 2-14: Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species (Malaga/Rock Island Industrial Area)

Species	Breeding Season
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Apr 1 to Aug 31
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Dec 1 to Aug 31
California Gull (<i>Larus californicus</i>)	Mar 1 to Jul 31
Cassin's Finch (<i>Carpodacus cassinii</i>)	May 15 to Jul 15
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	May 15 to Aug 10
Golden Eagle (<i>Aquila chrysaetos</i>)	Jan 1 to Aug 31
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Apr 20 to Sep 30
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Apr 15 to Aug 10
Western Grebe (<i>Aechmophorus occidentalis</i>)	Jun 1 to Aug 31

Aquatic Resources

There are two features mapped on the National Wetland Inventory (NWI) map in the vicinity of the Malaga crossing location: the Columbia River and one freshwater pond feature (see Appendix B for the NWI Map). According to the Washington Department of Natural Resources Forest Practices Application Mapping Tool, the Columbia River, identified as a Type-S (shoreline of the state) stream is the only water resource identified within the area (see Appendix B for the DNR Map). The width of the Columbia River is estimated to range from approximately 875 feet to 1,135 feet within the study area. The Rock Island Railroad Bridge is the only structure that crosses the Columbia River within the vicinity of the Malaga/Rock Island Industrial Area crossing site study area.

The FEMA FIRM for the area does not indicate any flood zone areas outside of the Columbia River within the Malaga Area Industrial crossing site study area.

Cultural Resources

To determine the likelihood of cultural resources being present at the Malaga Area crossing site or within the immediate vicinity, the DAHP WISAARD Mapping tool (2023) was reviewed for the study area. The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the Malaga Area crossing site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool also identifies that the Rock Island Railroad Bridge is listed on the NHRP and the Washington Heritage Register.

During informal coordination, the Tribal Historic Preservation Officer of the Colville Tribe also indicated that the Malaga Area crossing site study area has the potential to contain significant historic properties not identified within the publicly accessible WISSARD database.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Malaga Area crossing site. The site is predominantly located in both Douglas County (Census Tract 9503) and Chelan County

(Census Tract 9612). Table 2-15 details the socioeconomic data for the census tracts in the area compared to Douglas and Chelan Counties, as well as the National averages.

Table 2-15: Malaga Location, 2021 Census Data

Characteristics	BG 5, Tract 9503, Douglas, WA	BG 3, Tract 9612, Chelan, WA	Douglas County, WA	Chelan County, WA	U.S. Average or Value
Population Demographics					
Total Population	1,471	896	42,622	79,646	331,893,760
Male	54.0%	44.1%	51.0%	48.9%	50.0%
Female	46.0%	55.9%	49.0%	51.1%	50.0%
Median Age	32.4	46.8	37.5	39.3	38.8
Race					
White	45%	58%	62%	66%	58.0%
Hispanic	52%	41%	33%	29%	19.0%
Other	3%	1%	1%	3%	23.0%
Households					
Number of Households	465	303	15,278	32,050	127,544,730
Persons per Household	3.1	3.0	2.8	2.5	2.5
Education					
High School Graduate or Higher	67.1%	75.7%	82.1%	86.5%	89.4%
Bachelor's Degree or Higher	5.8%	48.6%	21.2%	34.1%	35.0%
Economic Status					
Median Household Income (2021)	\$58,849	\$106,397	\$68,979	\$65,847	\$69,717
Per Capita Income	\$23,202	\$61,909	\$35,094	\$43,694	\$38,332
Families below Poverty Level	-	-	9.7%	10.2%	12.8%

Soils and Farmland Classification

Soils information and associated farmland classifications for the Malaga/Rock Island Industrial Area crossing site was obtained from the NRCS Web Soil Survey. Table 2-16 details the types of soils and their respective locations within the site location (see Appendix B for the NRCS Web Soil Survey). The location contains soils that are considered Prime Farmland if Irrigated, Farmland of statewide importance, and Farmland of unique importance.

Table 2-16: Soil Types and Farmland Classifications (Malaga/Rock Island Industrial Area)

Soil Map Unit Name	Map Unit Symbol	Farmland Classification
Chelan County		
Cashmont stony sandy loam, 0 to 25 percent slopes	CeD	Farmland of unique importance
Ellisforde fine sandy loam, 3 to 8 percent slopes	EfB	Prime farmland if irrigated
Ellisforde silt loam, 8 to 15 percent slopes	EIC	Farmland of unique importance
Malaga gravelly fine sandy loam, 0 to 3 percent slopes	MaA	Not prime farmland
Malaga gravelly fine sandy loam, 3 to 15 percent slopes	MaC	Not prime farmland
Quincy loamy fine sand, 0 to 15 percent slopes	QuC	Farmland of statewide significance
Rock outcrop	Ro	Not prime farmland
Douglas County		
Entiat-Rock outcrop-Torriorthents complex, 30 to 70 percent slopes	165	Not prime farmland
Malaga gravelly fine sandy loam, 0 to 8 percent slopes	231	Prime farmland if irrigated
Malaga cobbly fine sandy loam, 0 to 8 percent slopes	232	Not prime farmland
Pogue extremely stony fine sandy loam, 3 to 25 percent slopes	268	Farmland of unique importance
Quincy loamy fine sand, 0 to 15 percent slopes	274	Not prime farmland
Torriorthents, very steep	427	Not prime farmland

Sensitive Lands

Most of the land in the vicinity of the Malaga Area crossing site is undeveloped with the exception of the Rock Island Dam and associated infrastructure and facilities. The Land and Water Conservation Fund mapping tool (2023) was utilized to identify any previously federally funded project locations in the vicinity of the proposed site. No previously federally funded projects were located in the vicinity of the proposed site.

2.3.5 NEPA/SEPA and Environmental Permitting

Any new or expanded bridge crossing will ultimately require funding and approvals from federal, state, and local government agencies and require compliance and reviews under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). Beyond the base need for NEPA and SEPA compliance, construction of a new or expanded bridge crossing across the Columbia River would require obtaining various permits and associated regulatory clearances with various federal, state, and local government entities. Table 2-17 below lists the various environmental permits and regulatory clearances that are anticipated to be required.

Table 2-17: Anticipated Environmental Permitting and Associated Regulatory Clearances

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act	The discharge of dredged and/or fill material into waters of the US.
WA Department of Ecology (DOE)	Section 401 of the Clean Water Act State Water Pollution Control Act	Discharges into Waters of the US and Waters of the State, including wetlands.
US Coast Guard (USCG)	Section 9 of the Rivers and Harbors Act of 1899 General Bridge Act of 1946	Bridges crossing navigable waters of the US.
USFWS and NOAA Fisheries	Section 7 of the ESA	Effects to ESA listed species.
WA DAHP State Historic Preservation Office	Section 106 of the NHPA	Effects to cultural resources/historic properties.
WA Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval	Work in or near state waters.
Local Government (City/County)	Shoreline Management Act Critical Areas Ordinances	Work within 200 feet of the shoreline of a water of the state and/or critical areas.
Chelan County PUD	Rock Island License, Article 412(d)	Crossing of "Project Waters" within the FERC licensed boundaries of Rock Island Dam

2.4 Geotechnical

Baseline geotechnical information to support this study is limited to review of readily available geological and geotechnical information, review of mapped geologic hazards in the area, and a cursory visual field observation within the proposed crossing location option areas. The Desktop Geotechnical Review document is provided in Appendix C and summarized herein.

2.4.1 Local Geology

According to *The Geology of the Wenatchee and Monitor Quadrangles, Chelan and Douglas Counties*, (Gresens, 1983)^[1], as shown in Figure 2-16 below, the geologic units that underlie the Columbia River and its shorelines from the north end of the project segment extending to Rock Island Dam include:

- **Manmade Fill and Modified Land (Qf)** – Mapped predominantly at the Alcoa Wenatchee Works plant.
- **Alluvial Fan Deposits (Qaf)** – typically consisting of sandy gravel to gravelly sand with varying quantities of cobbles to boulders and silts. Mapped north of the Alcoa Wenatchee Works plant on the Douglas County shoreline.
- **Landslide Deposits, Undifferentiated (Qls)** – typically consisting of poorly sorted bouldery gravel to bouldery mud; most exhibit hummocky surfaces and bulbous toes. Present in localized areas on the Douglas County side across from Malaga and in Chelan County near the existing rail crossing east of Malaga.

- **Oligocene Continental Sedimentary Deposits, Wenatchee formation Oc(w)** – Present in a relatively small area on the Douglas County shoreline at the existing rail crossing east of Malaga.
- **Swakane Biotite Gneiss (pCgn(s))** – a localized area on the Douglas County shoreline south of the existing US 2 / 97 crossing.
- **Outburst Flood Deposits, Gravel (Qfg)** – typically consisting of sandy coarse gravel with varying quantities of cobbles to boulders.
- **Grande Ronde Basalt (Mv(gR2)) of the Columbia River Basalt Group (CRBG)** – mapped in Douglas County north and south of the Rock Island Dam.

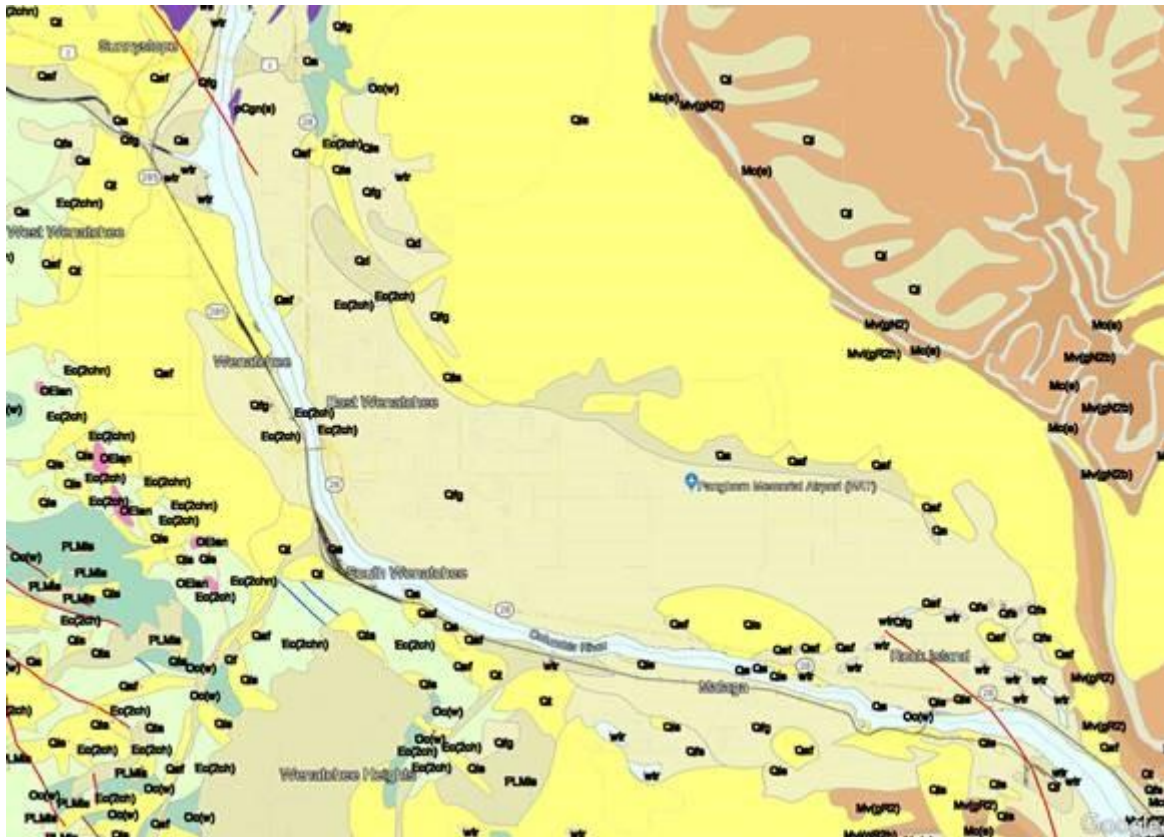


Figure 2-16: Geologic Map

Source: Chelan PUD

Based on our local experience, we anticipate groundwater along the alternative CRC alignments coincides closely with the Columbia River surface elevation.

2.4.2 Geologic Hazards

Potential geologic hazards along the Columbia River through the project segment and nearby areas (less than about ½-mile radius of the project segment) were reviewed based on the Washington State

Department of Natural Resources (DNR) information portal¹ and local experience. The geologic hazards review through the project segment is summarized below.

- **Earthquake Shaking Hazard** - Low to moderate expected, which translates to a primary Seismic Design Category (SDC) (shaking hazard combined with anticipated subsurface conditions) of C with localized areas mapped along the Columbia River shoreline of SDC B and D0.
- **Liquefaction Hazard** – Primarily low to moderate with localized areas of very low to low, moderate to high, and high.
- **Landslide Hazard** – Primarily low with segments of moderate to high within the QIs deposits (pre-historic to historic landslides). The QIs deposits in the area are known to be increasingly unstable due to heavy precipitation events and/or increasing groundwater levels.
- **Volcanic Hazard** – None mapped

In our opinion, the potential for earthquake-induced ground surface rupture is low at the four alternative alignments as the nearest potentially active faults are the east-west trending Kittitas Valley faults about 25 miles southwest and the northwest-to-southeast trending Umtanum Ridge Structures with inferred faults mapped about 39 miles southwest of the Rock Island dam.

Based on our local experience, the potential for flash flooding also exists within the major drainages of the area, including the approximately north-south trending Squilchuck Creek and Stemilt Creek drainages. Flash floods exiting the drainage systems at the Columbia River pose erosion risks along the Columbia River shoreline and could impact nearby structures due to hydraulic forces on supporting foundations and/or columns.

2.4.3 Bridge Substructure Considerations

Based on the geology and geologic hazards discussion above, in our opinion, a new CRC representative alignment is feasible at the four alternative alignments. Within the scope of the geology and geotechnical discussion above, the primary differentiating factor between the alternative alignments are the mapped geologic units and likely subsurface conditions. However, based on our experience within these geologic units and with other bridge projects, structure foundations would be designed to extend through potentially lesser competent soils (e.g., alluvial fans, etc.) into relatively unyielding conditions (e.g., potentially flood gravels or CRBG).

Based on our experience, deep foundations would likely be utilized at most pier locations with potential spread footings at abutments in very dense soils and/or bedrock. Drilled shafts can be designed to resist seismic design forces; downdrag from consolidating layers or fill, potentially following a seismic event which induced liquefaction; and other support considerations. Within bedrock and dense to very dense bearing conditions, shallow foundations may be utilized, permitting the excavation can be completed in the dry.

A geotechnical exploration program should be completed for the selected alignment(s) to develop site-specific geotechnical design and construction recommendations. The exploration program should include

¹ Washington State Department of Natural Resources (DNR), 2022, Geologic Information Portal, Interactive Map, accessed July 2023 from DNR website at: <https://geologyportal.dnr.wa.gov/2d-view>

subsurface explorations (e.g., borings, test pits, and potentially others) for the proposed structure(s), pavements, utility alignments, and other potential items that require geotechnical input.

2.5 Real Property

High-level land use and property ownerships were reviewed in each of the four crossing location areas along both sides of the Columbia River to inform feasibility and identify potential issues and opportunities for the crossing options as potential representative alignments are considered.

Chelan and Douglas County assessor's maps were used to review ownerships, land use, and assessed values of private land to establish a basis for providing property acquisition estimates for crossing options. Initial observations for each of the three crossing location options are provided below.

2.5.1 Ownership and Land Use Considerations

Downtown Connection

Most of the land in Wenatchee along the Columbia River and Spokane St is built industrial and commercial properties with PUD owned property along the River shoreline. The Apple Capital Loop Trail and various PUD and city maintained parks are located along the riverbank, Such as the Wenatchee Riverfront Park and Hale Park (Figure 2-17). There are also numerous commercial properties on the north and south frontages on Spokane St and west of Worthen St. The BNSF railroad creates a barrier between the properties and roadway network along the riverbank and the rest of downtown Wenatchee to the west.

In East Wenatchee, most of the land along the river and SR28 is owned by the City of East Wenatchee, Chelan PUD, or WSDOT. The Douglas County Sewer districts owns and operates the water treatment plant between SR28 and the river. The Apple Capital Loop Trail also exists along the riverbank on the east side of the river. Residential development exists between the River and SR28 north of 13th St NE.

SR285 Expansion

In Wenatchee, the existing ROW is constrained by high-value commercial properties. Locomotive Park is to the North of SR285 and small public parcels exist on the southeast quadrant of the SR285/Mission St. intersection.

There is a significant amount of existing WSDOT ROW on the east side of the Columbia River in the form of the bridge approaches and ramps to/from SR28 as shown in the exhibit below (Figure 2-18). However, there are costly private properties to the south and east such as the Fred Meyer parcel and various parcels along the western frontage of Valley Mall Pkwy.

Mid-Valley Crossing

This proposed location (Figure 2-19) also has significant unbuilt acreage, with the Chelan County side remaining largely agricultural and Chelan PUD property off the shoreline of the Columbia River.

There are multiple housing developments between the riverbank and SR28 and SR28 and Rock Island Road. Existing PUD parks and a mobile home park are present and should be avoided where possible.

Malaga/Rock Island Industrial Area

This proposed crossing location option (Figure 2-20) has the most unbuilt acreage, but little is public. Most of the available land on the southern shore of the Columbia River is owned by Chelan PUD or the now shuttered Malaga-Alcoa Aluminum Plant. The BNSF railroad runs between the bank of the river and SR28.

Each crossing location described above has varying degrees of complexity related to land ownership and availability necessary for a new bridge and the associated roadway and active transportation infrastructure. The SR285 Expansion area does have substantial ROW that could be repurposed for a new bridge and approaches. The Downtown Connection location also has public lands within its study area, however, there are limitations due to parks and pathways next to the river. Lastly, the Malaga Industrial and Mid Valley options have substantial unbuilt acreage, however, most of the property is not publicly owned.

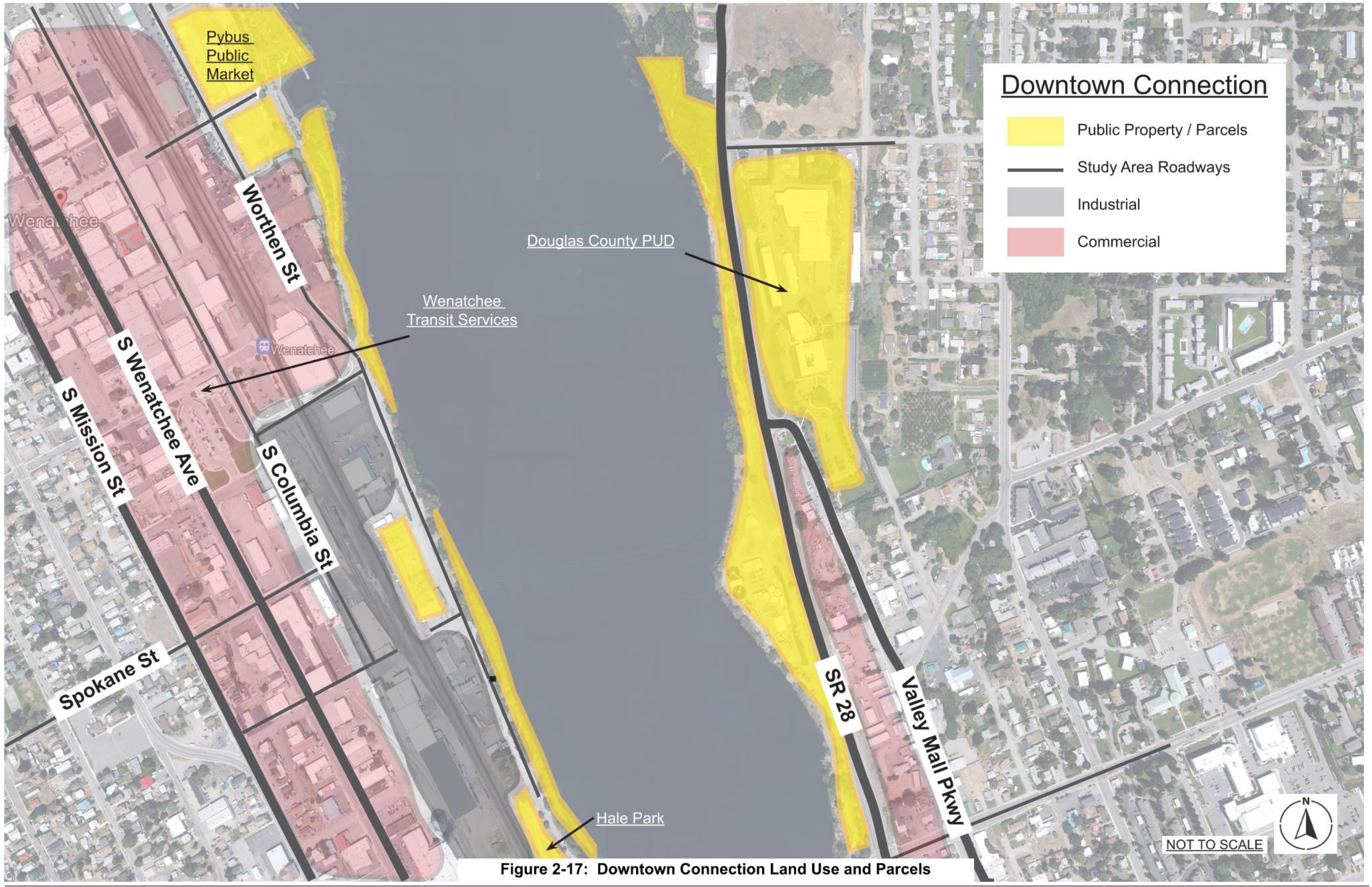


Figure 2-17: Downtown Connection Land Use and Parcels

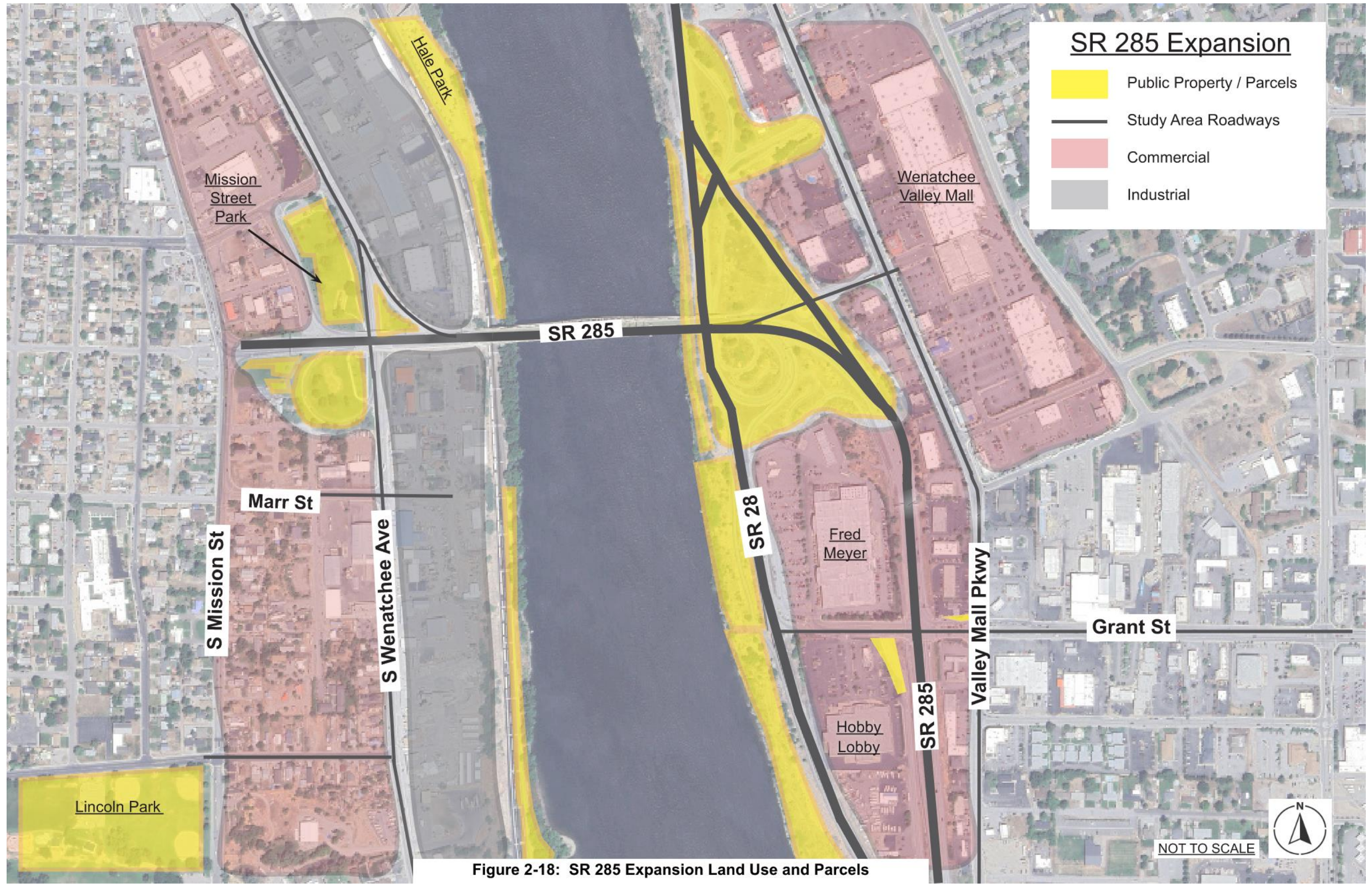


Figure 2-18: SR 285 Expansion Land Use and Parcels

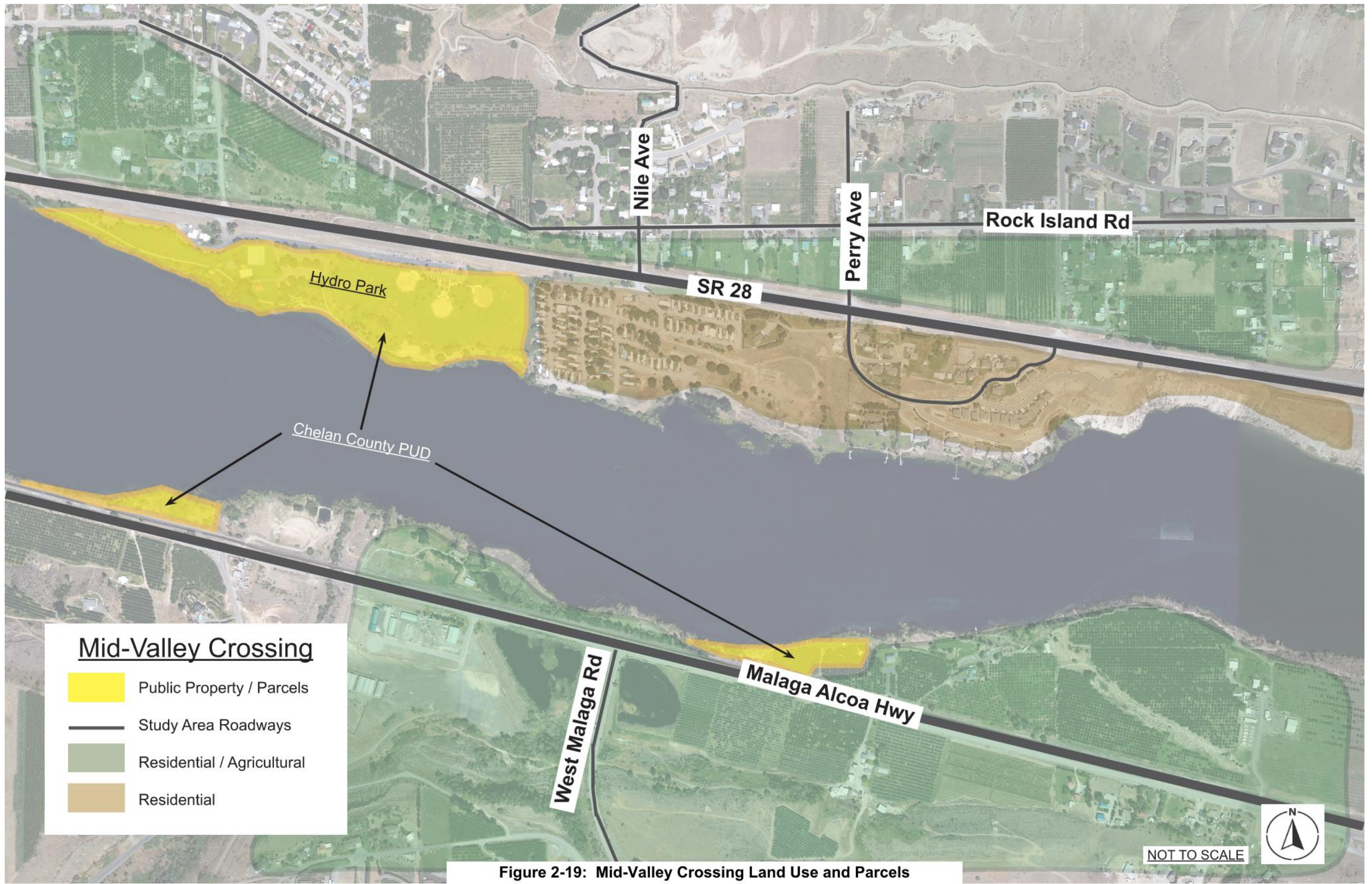


Figure 2-19: Mid-Valley Crossing Land Use and Parcels

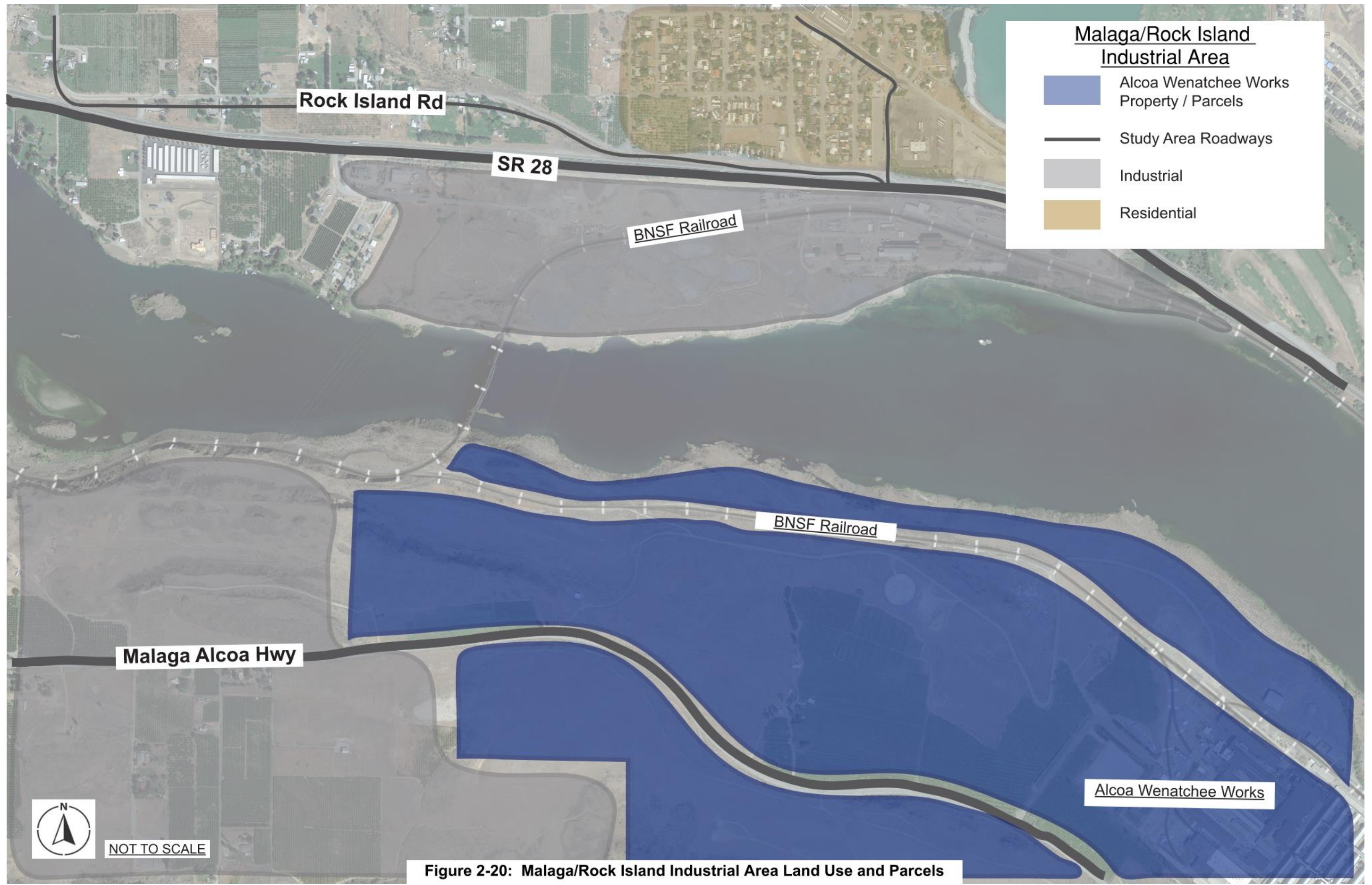


Figure 2-20: Malaga/Rock Island Industrial Area Land Use and Parcels

3. CONCEPT DEVELOPMENT AND ANALYSES

3.1 Fourth Crossing Location

Three general, potential crossing locations had already been identified by the CDTC staff. To ensure a comprehensive review of other potential bridge locations, the existing transportation network was reviewed to identify a potential fourth crossing location to be studied further. Potential fourth crossing options were identified in four different areas as shown in Figure 3-1. Each of the areas was reviewed to understand

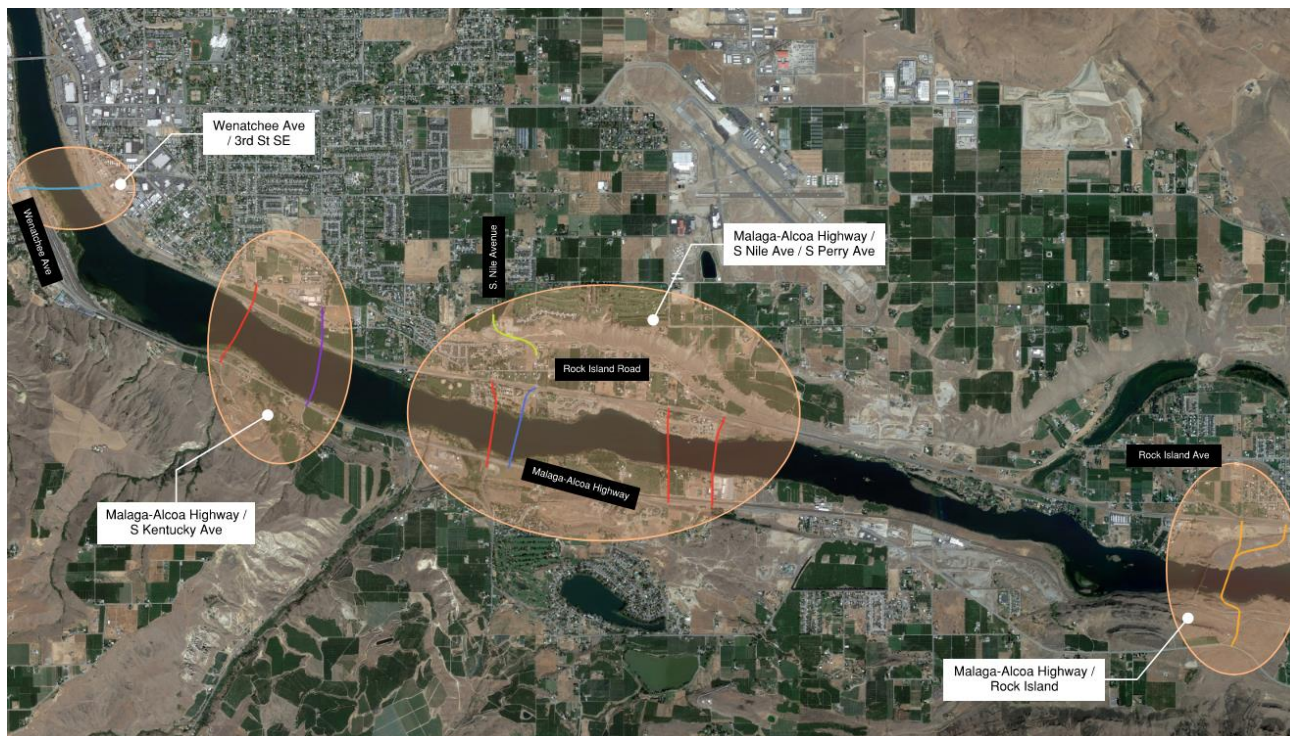


Figure 3-1: 4th Crossing Location Options Overview

unique opportunities and issues related to infrastructure/cost and environment. The review analysis is provided in Appendix D. traffic operations,

The potential fourth crossing locations were shared with CDTC and the SAC. Results of the discussions and decisions are summarized as follows.

Wenatchee Ave / 3rd St SE. It was determined that functionally, this alignment essentially serves to connect highway-to-highway traffic and should be evaluated as a representative alignment for the SR285 Expansion crossing location.

Malaga-Alcoa Highway / Rock Island. It was determined that functionally, this alignment location connects and enhances development opportunities in the Malaga industrial and Rock Island areas and should be considered as a representative alignment for the Malaga/Rock Island Industrial Area crossing location.

Malaga-Alcoa Highway / S. Kentucky Ave. This location provides arterial network connectivity between Malaga and East Wenatchee. However, sensitive PUD properties along the River, including Hydro Park and Apple Capital Loop Trail would be impacted. Rock Island Rd, Near S. Kentucky Ave would require significant improvements to handle the additional traffic generated as it is currently a two-lane rural roadway.

Malaga-Alcoa Highway / S. Nile Ave / S. Perry Ave. This location would connect W. Malaga Rd and Malaga-Alcoa Highway to Nile Ave in East Wenatchee, providing arterial network connectivity as well as access to Pangborn Airport and emerging commercial and residential developments. The connection at S. Perry Ave is preferred as it avoids directly impacting an existing residential development between SR28 and the river. A new connection from S. Perry Ave to S. Nile Ave would be needed to provide the desired connectivity to the airport and surrounding development. Douglas County is interested in improving Nile Ave already, due to tight horizontal curves and steep grades that prohibit large truck traffic.

It was decided to evaluate this 'Mid-Valley' crossing location further in the study. An initial potential alignment for this option, including the S. Perry to S. Nile connection, is shown in Figure 3-2.



Figure 3-2: Mid-Valley Crossing Location

3.2 Representative Alignments

Multiple alignment alternatives were identified for each of the four crossing locations. Recognizing the purpose of this study is to understand the benefits, costs, and impacts of four bridges, each with distinct purpose, a brief fatal-flaw review was done and the SAC was engaged to help to select a feasible, representative alignment for each crossing location. Each alignment concept shown herein is representative of a bridge that could achieve that purpose but is not considered final design for construction. Should the community decide to pursue a Columbia River Crossing in the future, a comprehensive, in-depth analysis and selection process (including robust public engagement) will be conducted to determine a preferred alignment location. As such, the initial alignments considered and representative alignments selected for this study are summarized below.

3.2.1 Downtown Connection

The initial alignments identified for this crossing location are shown in Figure 3-3. Alignments that did not pass the fatal-flaw review are shown in red.

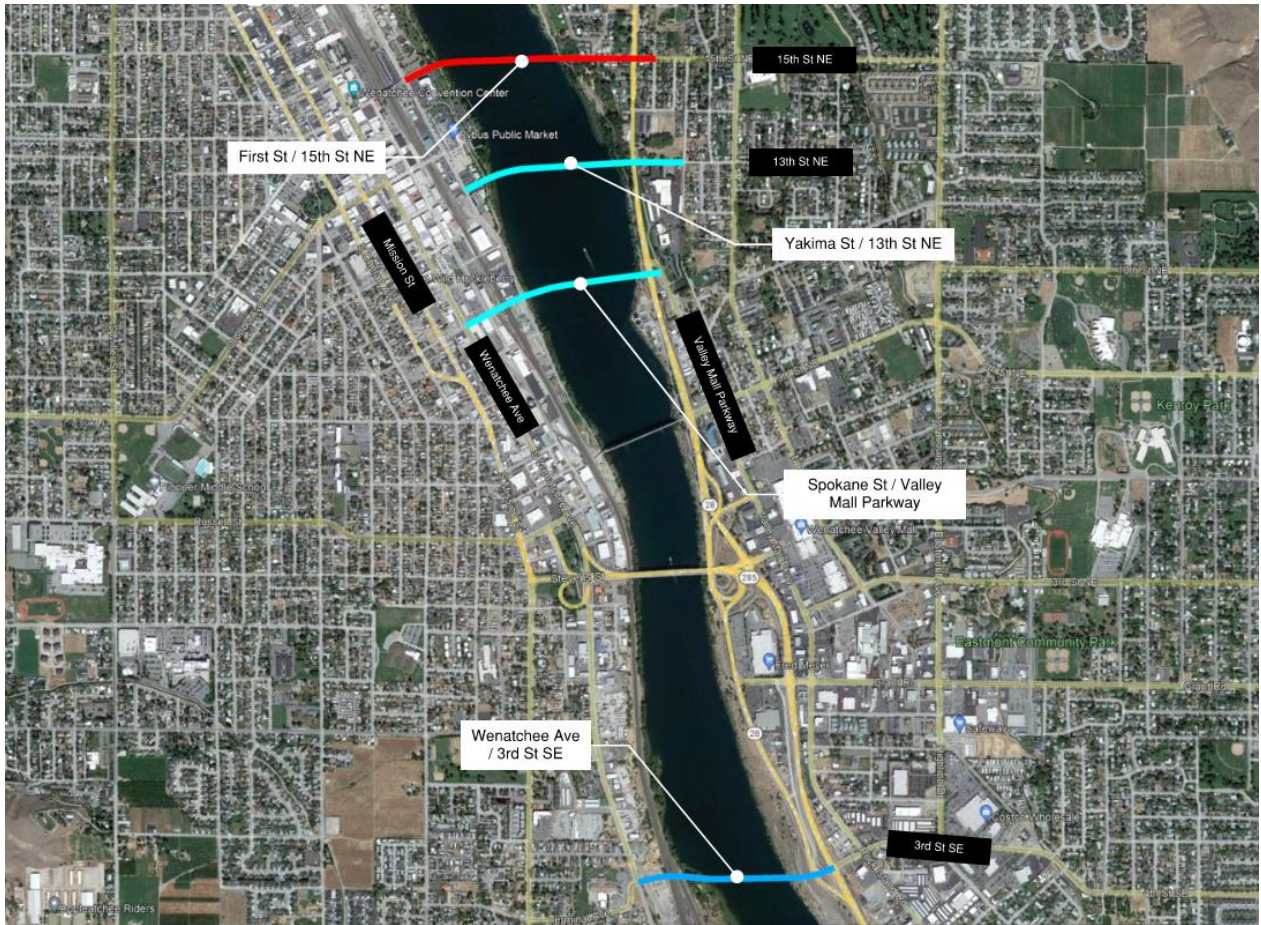


Figure 3-3: Downtown Connection Alignments Considered

The SAC and team selected the Spokane St. / Valley Mall Pkwy option as the representative alignment for the Downtown Connection location.

A traffic analysis was conducted to quickly ascertain whether it is preferable to fly over the railroad yard and tracks in Wenatchee or connect on Worthen St. Though the traffic analysis indicates that traffic capacity on Worthen St is not a fatal flaw, the SAC preferred a concept that crossed the railroad tracks due to operational benefits and long-term viability of the concept. This should be confirmed if the concept is studied further.

A traffic analysis was conducted to quickly understand if traffic from a downtown arterial bridge connection would need to tie in to SR28 in East Wenatchee, or could it connect into the roadway arterial network. The results indicated that there is no significant difference connecting to SR28 or the network east of SR28.

The initial representative alignment is shown in Figure 3-4.

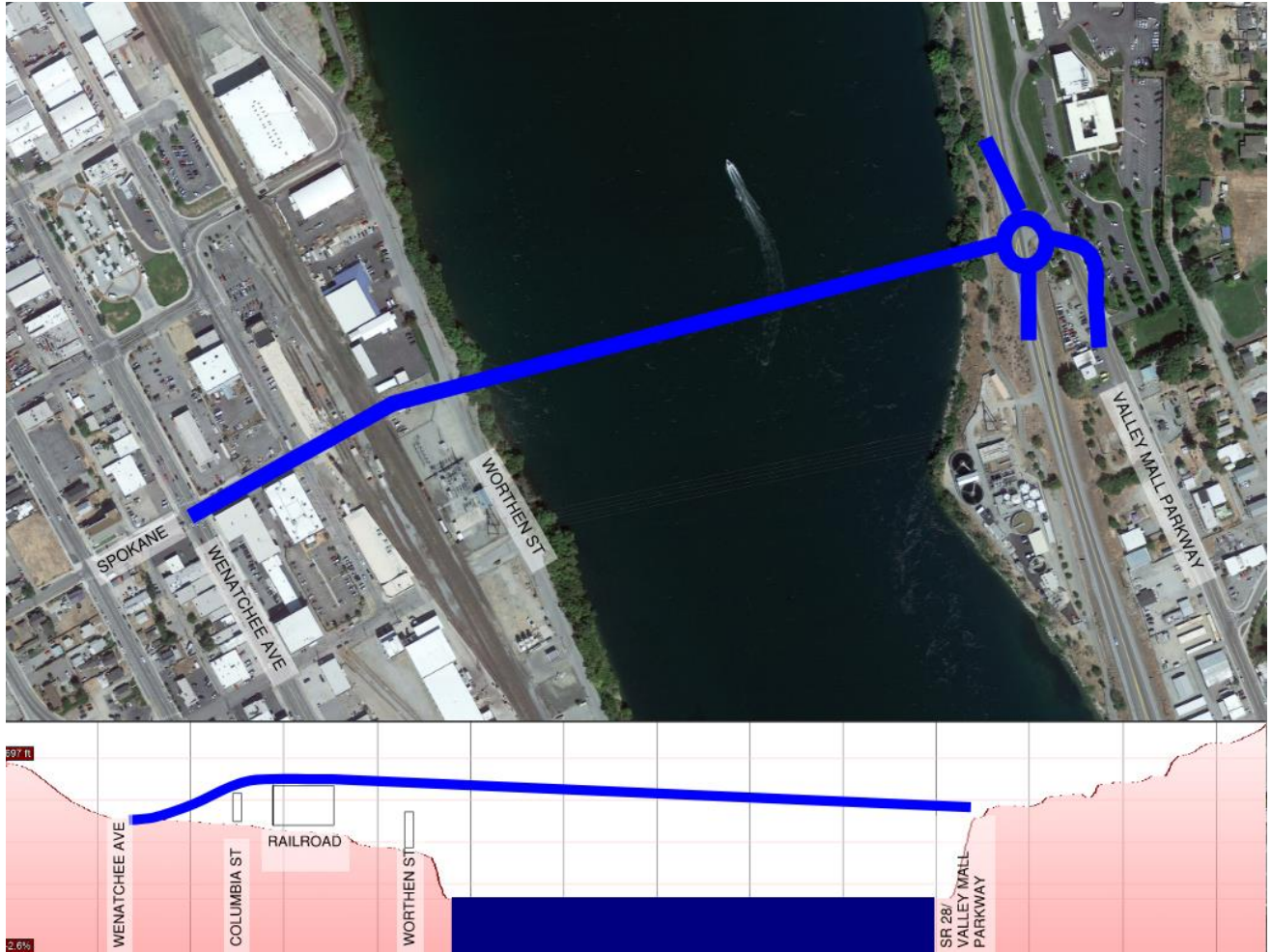


Figure 3-4: Downtown Connection Representative Alignment

3.2.2 SR285 Expansion

The initial alignments identified for this crossing location are shown in Figure 3-5. Alignments that did not pass the fatal-flaw review are shown in red.

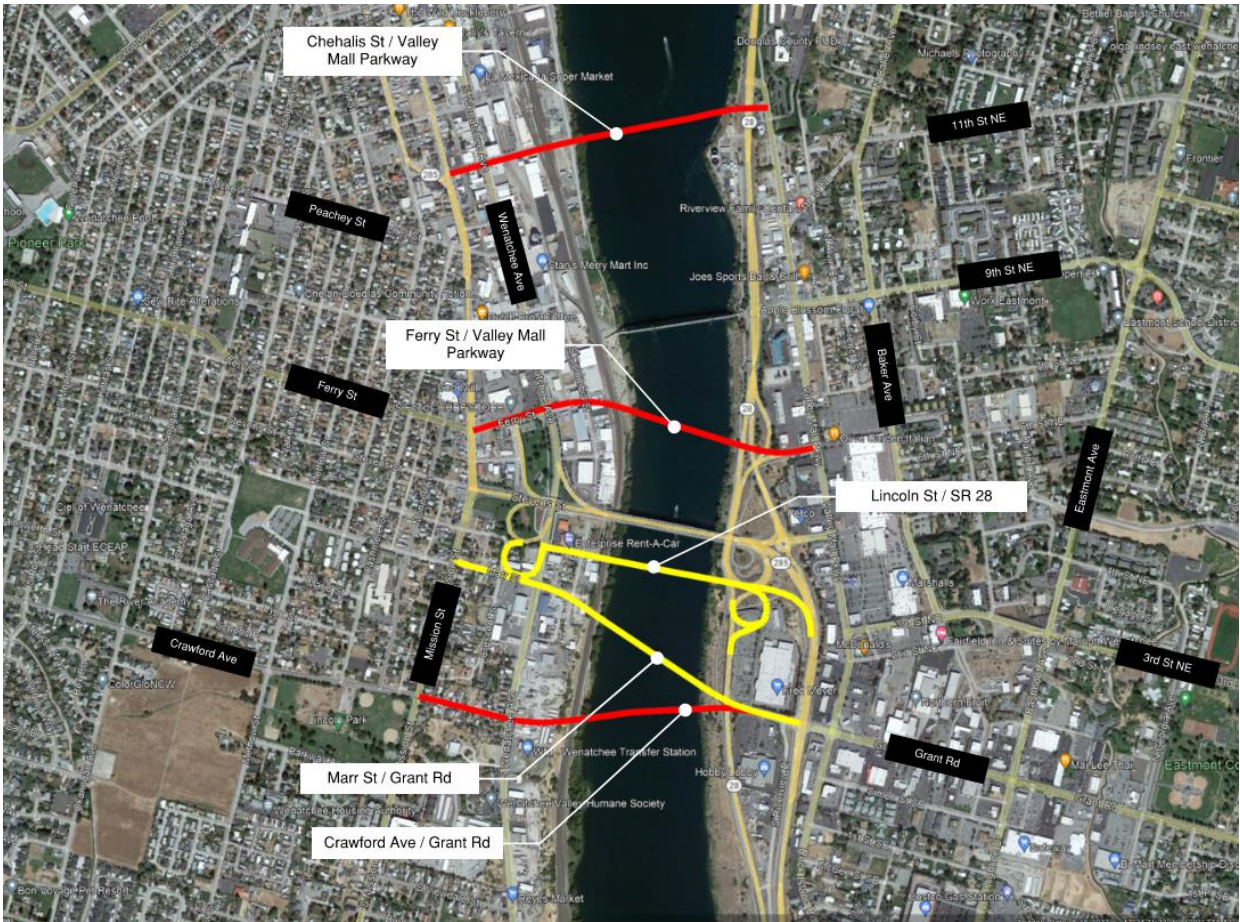


Figure 3-5: SR285 Expansion Alignments Considered

A traffic analysis was conducted to quickly understand if a parallel crossing with the Sellar Bridge would operate better if the two bridges were configured as a one-way couplet, or if they operated both providing two-way traffic. Key takeaways from this analysis:

- Couplet concepts require fewer ramps, but have more impact and require network expansion on local roads due to the higher directional volume increases.
- Two-way bridge concepts south of Sellar Bridge have poor westbound utilization on the new bridge due to lack of network connectivity. This may be mitigated by new flyover connections to the existing network.

The SAC noted that redundancy of a new two-way structure should be considered, in the case that one structure is unavailable for use.

The SAC and team selected a parallel alignment south of the Sellar Bridge, acting as the eastbound portion of a one-way couplet (with Sellar handling westbound traffic) as the representative alignment for the Downtown Connection location.

The initial representative alignment connected Marr St. to Grant Rd., but further analysis concluded to minimize property impacts, a parallel structure immediately south of the existing bridge should be carried forward (Figure 3-6).

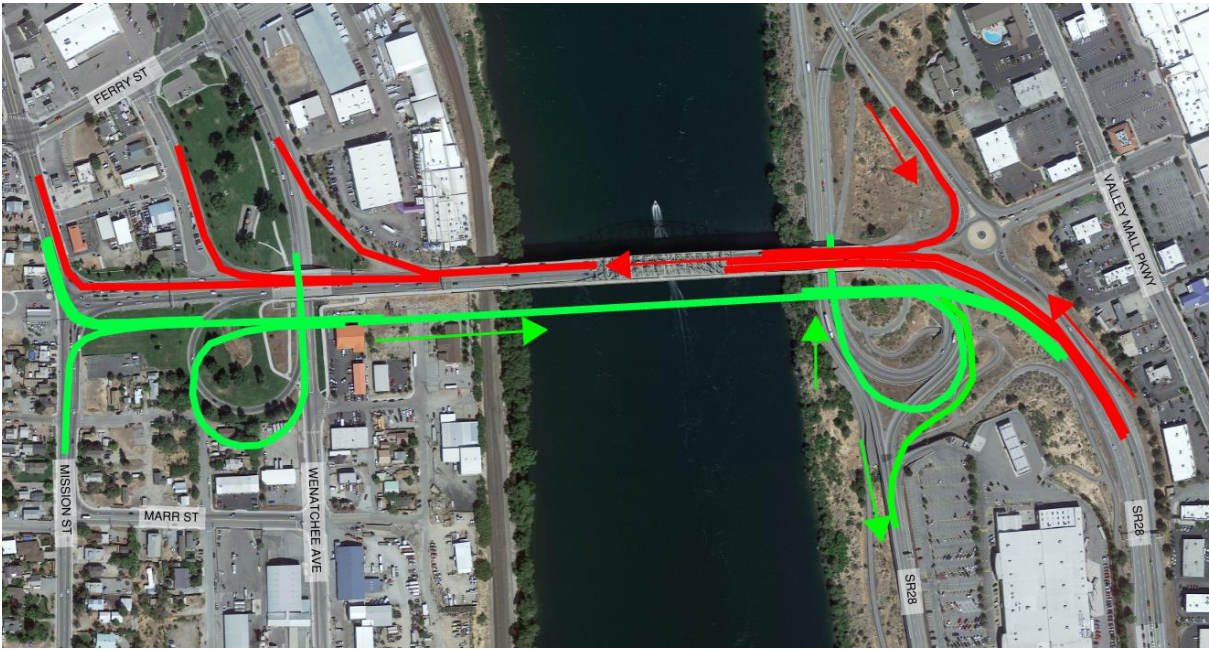


Figure 3-6: SR285 Expansion Representative Alignment

3.2.4 Mid-Valley Crossing

The initial alignments identified for this crossing location are shown in Figure 3-7. Alignments that did not pass the fatal-flaw review are shown in red.



Figure 3-7: Mid-Valley Crossing Alignments Considered

As part of the 4th crossing location analysis described earlier, the SAC and consultant team selected the Crossing connecting W. Malaga Rd with S. Nile Ave via S. Perry Ave. This representative alignment provides an optimal arterial connection between Malaga and East Wenatchee, and avoids impacts to the residential community along the Nile Ave corridor between SR28 and the river. The initial representative alignment is shown in Figure 3-8.

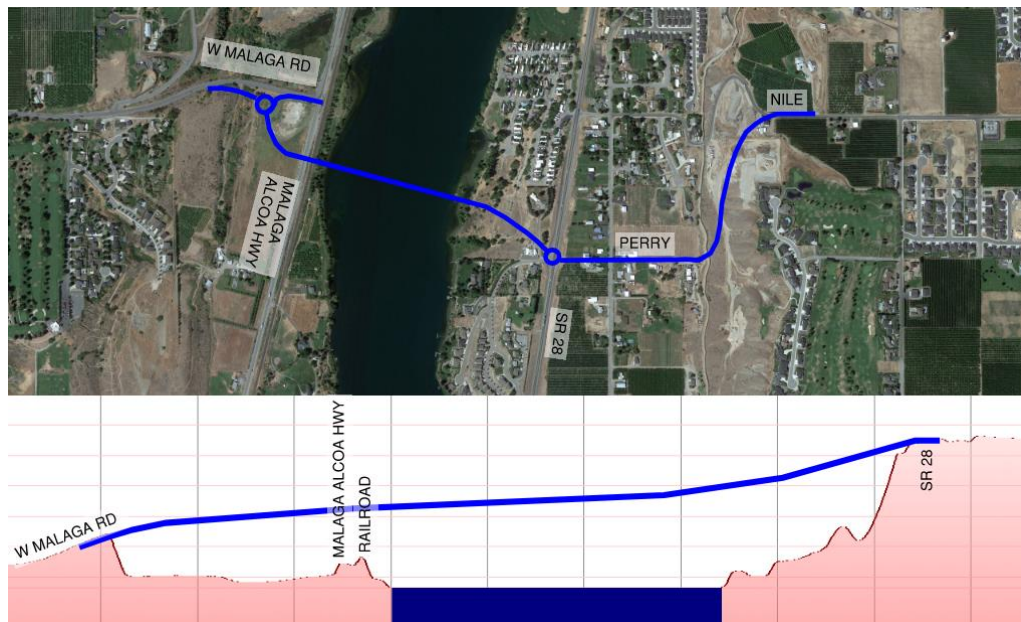


Figure 3-8: Mid-Valley Crossing Representative Alignment

3.2.5 Malaga/Rock Island Industrial Area

The initial alignments identified for this crossing location are shown in Figure 3-9. Alignments that did not pass the fatal-flaw review are shown in red.

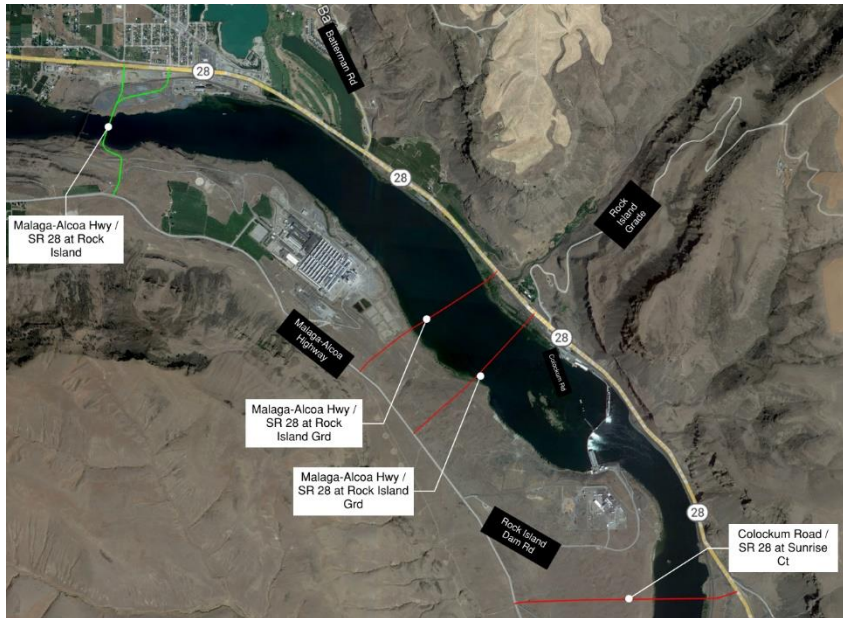


Figure 3-9: Malaga/Rock Island Industrial Area Crossing Alignments Considered

The SAC and team selected the Malaga-Alcoa Highway / SR28 connection at Rock Island. The crossing distance is shortest, and it has the added benefit of potential future connection to the Rock Island waterfront redevelopment site. The initial representative alignment is shown in Figure 3-10.

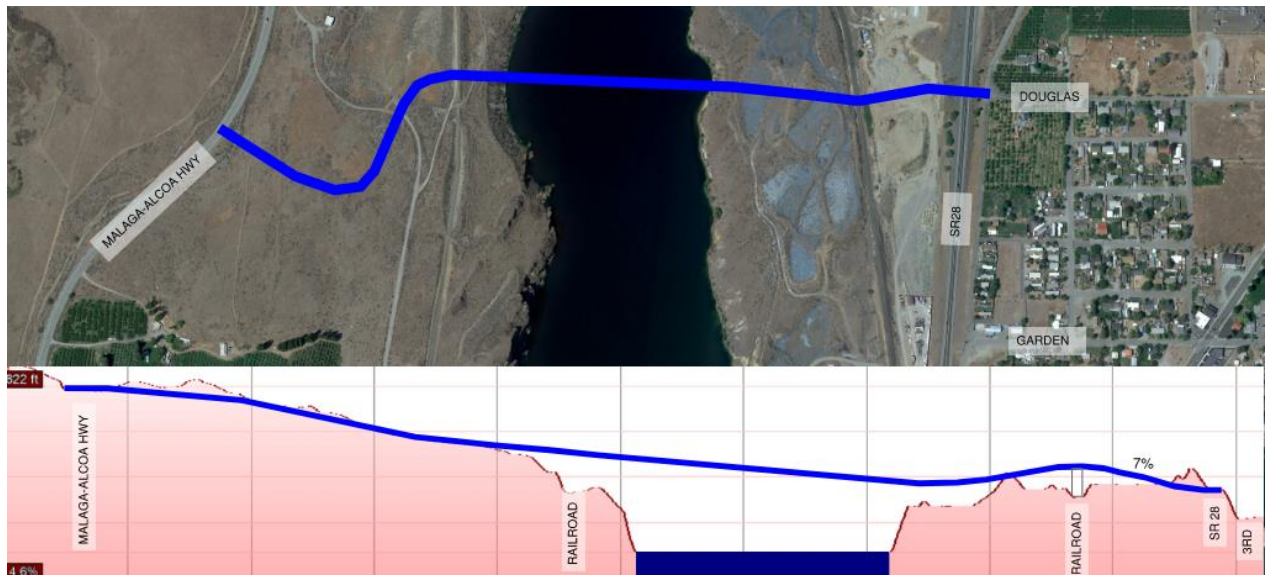


Figure 3-10: Malaga/Rock Island Industrial Area Representative Alignment

3.3 Representative Concepts

Representative concept plans and typical sections were generated for each of the representative alignments and are described below.

For the purposes of this study, a common set of structural assumptions and constraints were used for all locations considered. These include:

- **Span Length:** A maximum span length of approximately 230-250 feet was used for all bridge layouts. This span length range allows for common and economical girder type bridges which could be constructed using precast, prestressed concrete and/or steel plate girders. Construction methods for these types of structures are common and would not require specialty equipment and/or contractors that may not be found regionally. Longer span structures are possible and may be required depending on navigational requirements of the Columbia (see discussion below), environmental concerns, or other site features that may need to be avoided. These long-span structure types include steel tied arch, truss, cable-stayed and precast/CIP segmental concrete box girders.
- **Navigational Requirements:** The Columbia River is considered a navigable waterway and, as such, is subject to the purview of the United States Coast Guard. Preliminary document research performed by the team for this study indicated that the minimum vertical clearance for navigation, as measured to the 2 percent flowline of the river, is 50-feet. Horizontal limit requirements for navigation were not able to be determined at this time. It should be noted that the Richard Obadashian Bridge which was constructed in 1975 carries Highway 2 over the Columbia River and provides approximately 50-foot tall by 250-foot wide navigational openings.
- **Foundation Types:** For the purposes of this evaluation, it is assumed that the intermediate bridge piers are likely to be founded on drilled shaft deep foundations. These are typically cost effective to construct and keep construction impacts smaller when compared to other deep foundation types like driven piles.

3.3.1 Downtown Connection

As shown in Figure 3-11, the typical roadway section is assumed to include two travel lanes, two bike lanes, and two sidewalks.

In downtown Wenatchee, the west side of the crossing remains elevated over Worthen St and the railyard and touches down near Wenatchee Ave on Spokane St. Retaining walls will be required between Wenatchee Ave and Columbia St to retain the elevated roadway embankment. Existing sidewalks at ground level may be maintained or eliminated to provide vehicular access to the alley on Spokane St to maintain access to private property.

Traffic analyses as documented in Section 4, suggest that the additional directional volumes introduced in downtown Wenatchee at this location would require traffic signal improvements at Spokane St/Chelan Ave and Spokane St/Mission St.

In downtown East Wenatchee, the east side of the crossing will need to bridge over the Apple Capital Loop Trail. A roundabout connection with SR28 and Valley Mall Pkwy is assumed.

Traffic analyses as documented in Section 4 suggest that adding a slip lane at the existing roundabout on SR28 and 5th St NE will help mitigate delay from additional directional volumes at this location.

3.3.2 SR285 Expansion

As shown in Figure 3-12, the typical roadway section is assumed to include four travel lanes and two shoulders. No active transportation facilities are provided on the new structure as the multi-use path on the existing Sellar bridge is retained.

The new parallel couplet structure, carrying eastbound traffic, is located to the south and adjacent to the Sellar Bridge.

In Wenatchee, the west side of the crossing remains elevated over the railroad tracks, Columbia St and Wenatchee Ave, similar to the Sellar Bridge. Vehicles heading eastbound may access the bridge from Mission St at Stevens St or via a loop ramp from Wenatchee Ave. Westbound traffic on the Sellar Bridge would exit either on to Wenatchee Ave via a ramp, or to Mission St at Stevens St.

Traffic analyses as documented in Section 4, suggest a number of modifications in Wenatchee to match the number of lanes on and off the new and existing bridge and support the increased directional traffic volumes, including:

- Lane allocation (restriping) and signal timing adjustments on Ferry St signals with Mission St, Crescent St and Wenatchee Ave.
- Lane allocation (restriping, median relocations) and signal modifications on Mission St at Sellar Bridge.
- Westbound offramp to Wenatchee modified to be dual lane.
- Lane allocation (restriping) and new signals on Wenatchee Ave signals with SR285 on-ramp and Marr St.
- Lane allocation (restriping) and new signals on Marr St at Mission St.
- Roadway widening of existing arterials is not anticipated.

In East Wenatchee, the interchange ramps would be modified to accommodate directional traffic volumes. In order to minimize impacts to commercial properties, the existing eastbound offramp to southbound SR28 is eliminated. An additional SR28 northbound lane (3rd lane) will be required from Grant Rd. Signal timing improvements and lane allocation modifications will be required on Grant Rd and SR285.

3.3.3 Mid-Valley Crossing

As shown in Figure 3-13, the typical roadway section is assumed to include two travel lanes, two shoulders and a protected multi-use path.

In Malaga, the south side of the crossing remains elevated over the railroad and Malaga-Alcoa highway, touching down on West Malaga Rd. Roundabout intersections are shown at West Malaga Rd and Malaga-Alcoa highway, but signalized intersections may be viable as well.

In East Wenatchee, the crossing remains elevated to minimize impacts (of large embankment fills) to private property. A five-legged roundabout is shown connecting the new crossing with SR28 and Perry Ave.

As shown in Figure 3-14, north of SR28 on Perry Ave and Rock Island Rd, turn lanes will need to be added and potentially a new traffic signal to accommodate new volumes. A potential reroute of Nile Ave north of Rock Island Rd to mitigate geometric and grade deficiencies, connecting to Perry Ave would provide additional benefit and may be constructed as a standalone project, or as part of the Mid-Valley Crossing.

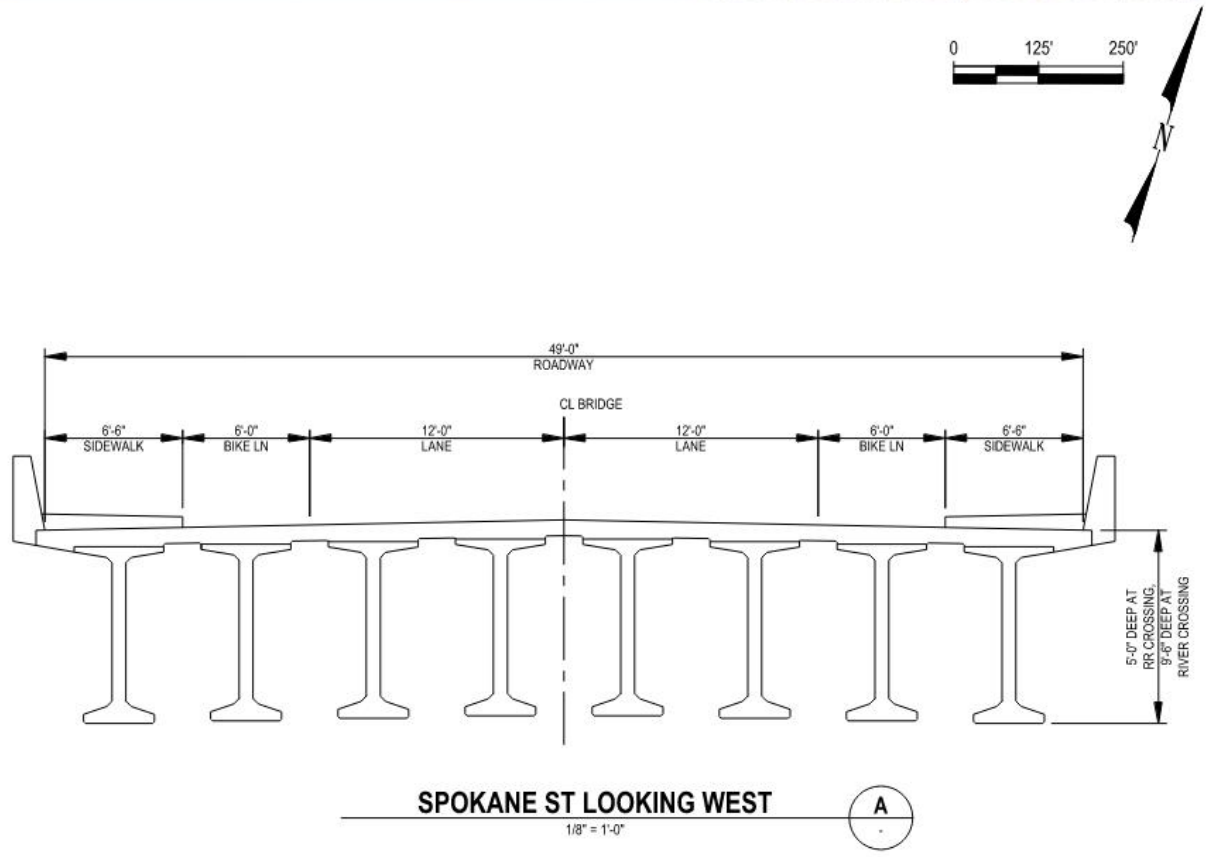
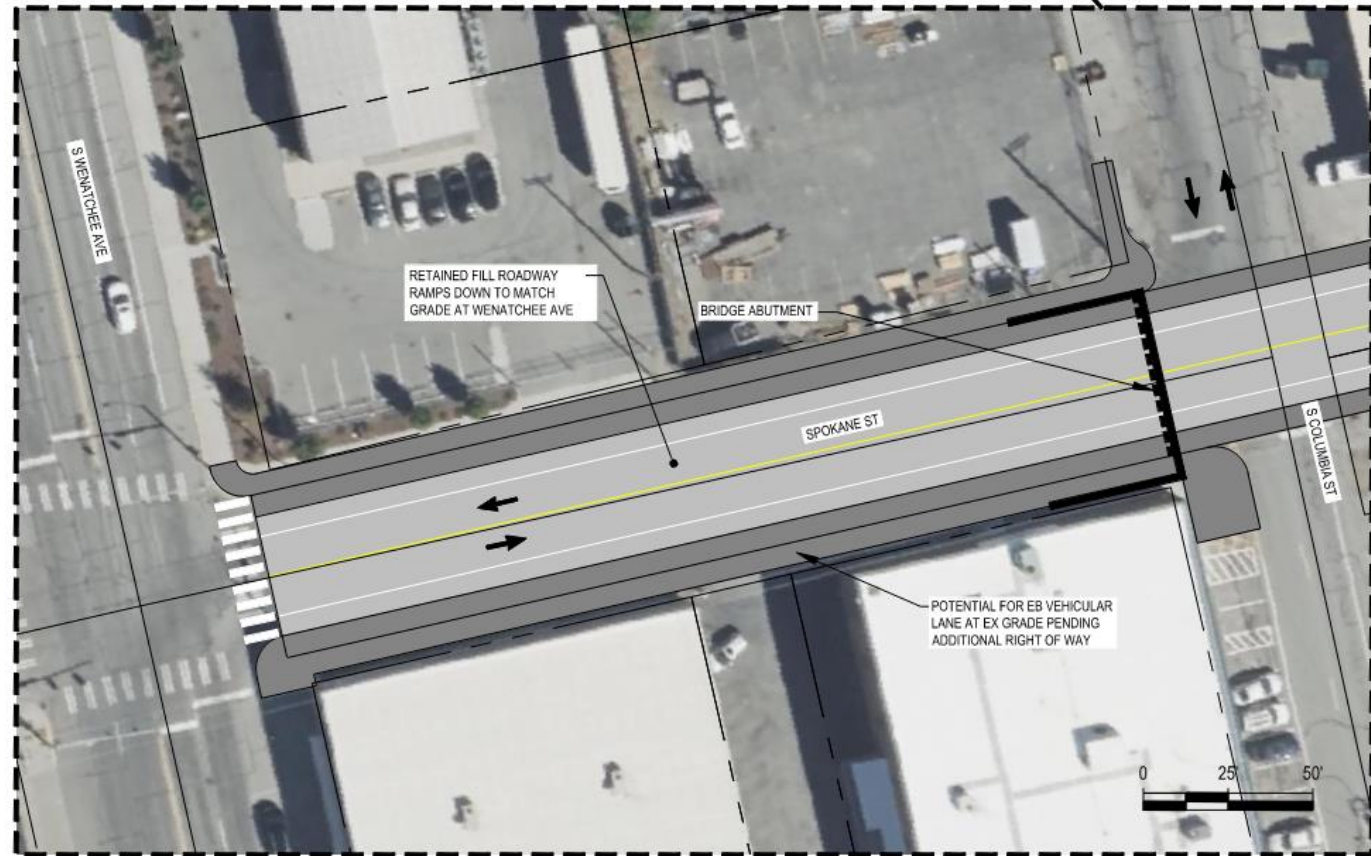
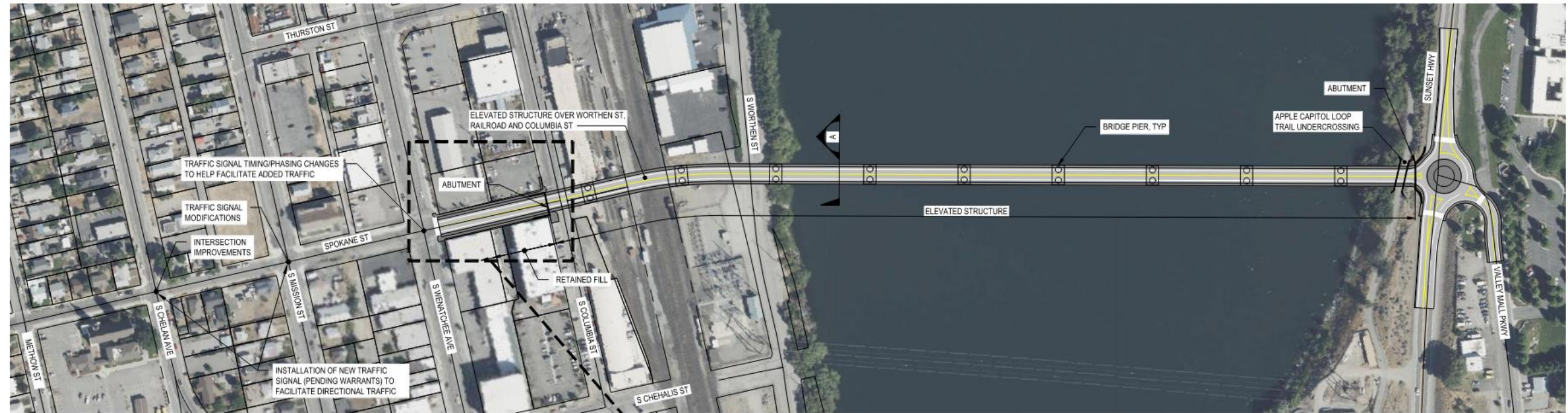
3.3.4 Malaga/Rock Island Industrial Area

As shown in Figure 3-15, the typical roadway section is assumed to include two travel lanes, two shoulders and a protected multi-use path.

In Malaga, the south side of the crossing remains elevated over the railroad and continues with large fill embankment (or retained fill) as it winds up the steep slopes towards Malaga-Alcoa Highway. A roundabout intersection is shown at Malaga-Alcoa highway, but a signalized intersection may be viable as well.

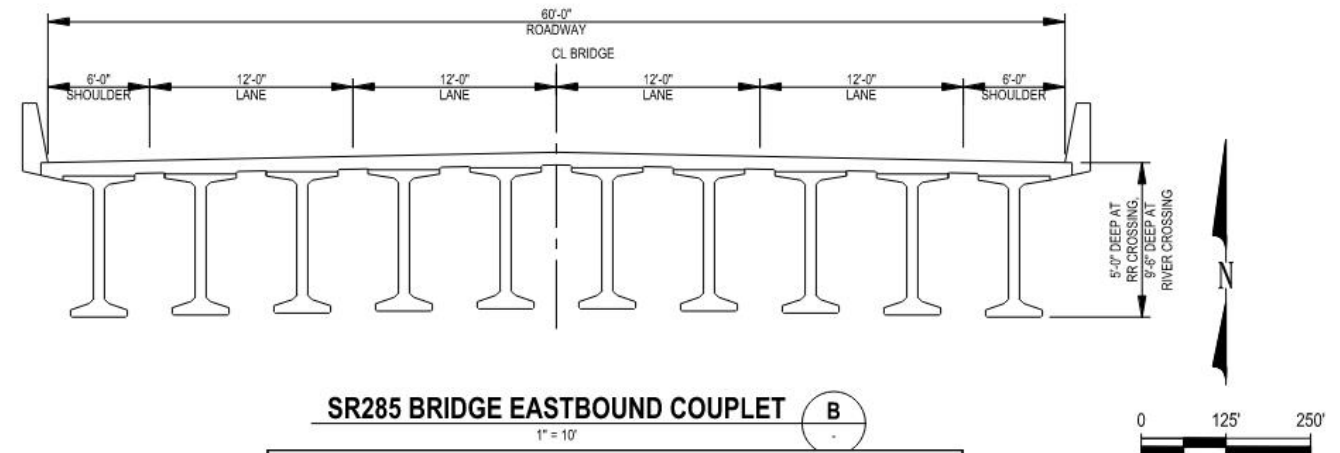
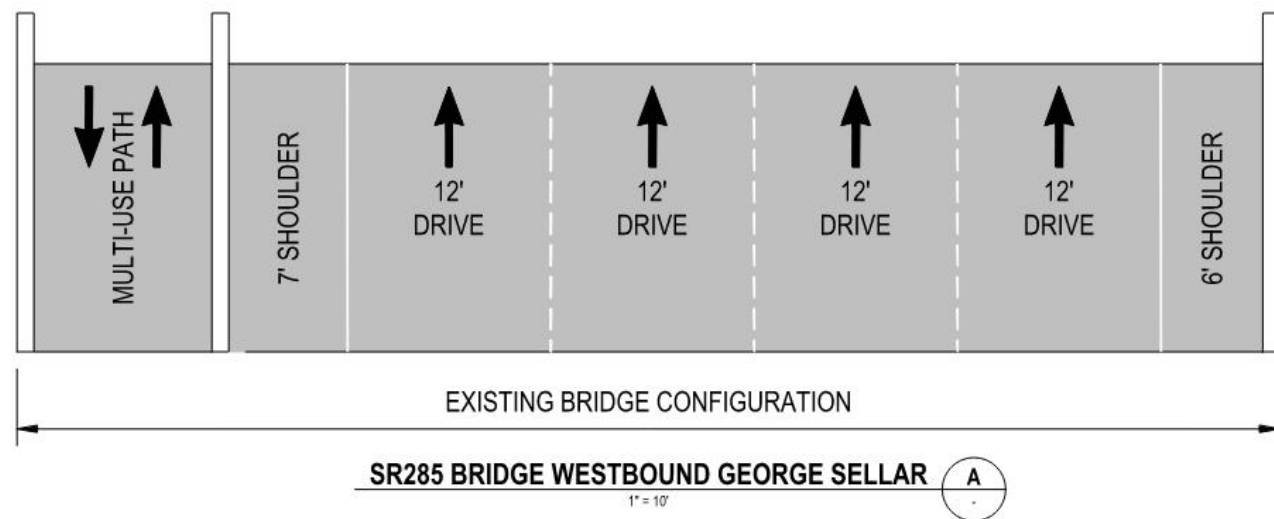
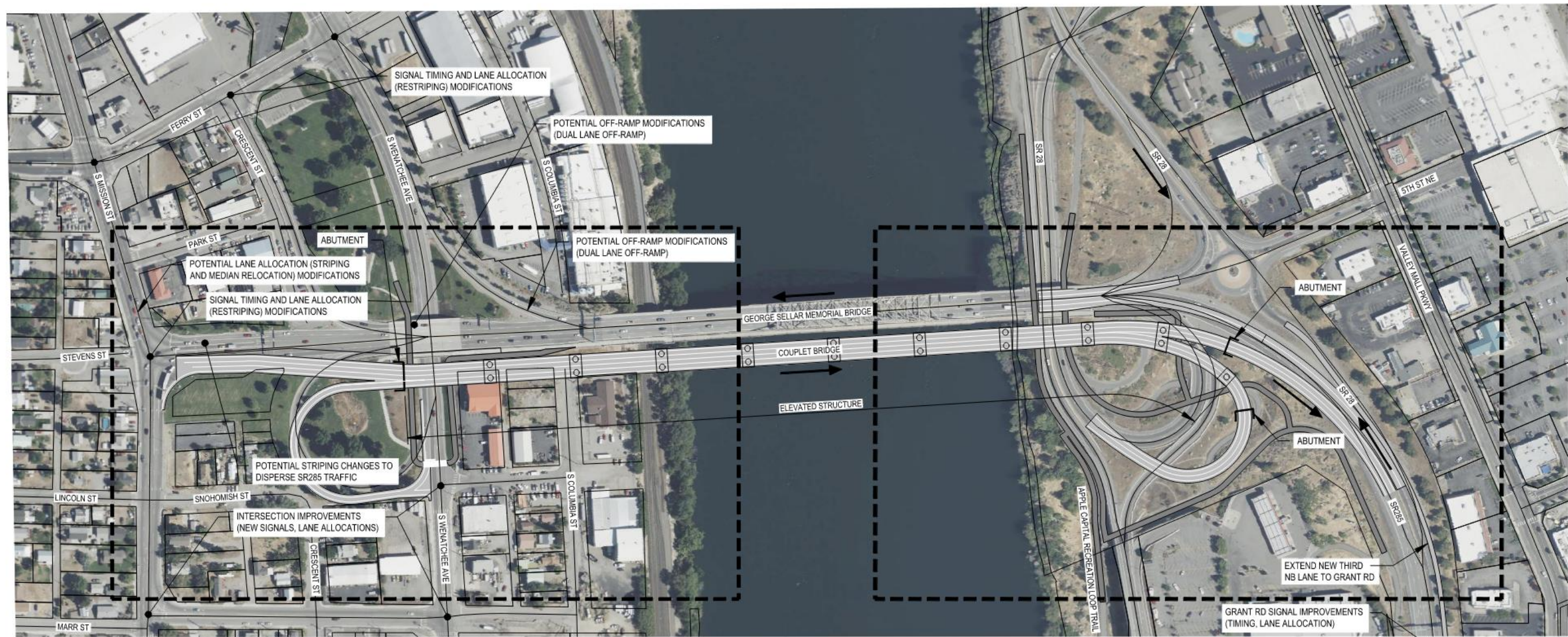
In Rock Island, the crossing ends at the riverbank with fill embankment (or retained fill) until an elevated crossing over the railroad. Then the new road continues on fill embankment (or retained fill) to the intersection with SR28. A roundabout intersection is shown at SR28. No connection to Rock Island's street networks north of SR28 is shown due to grade challenges.

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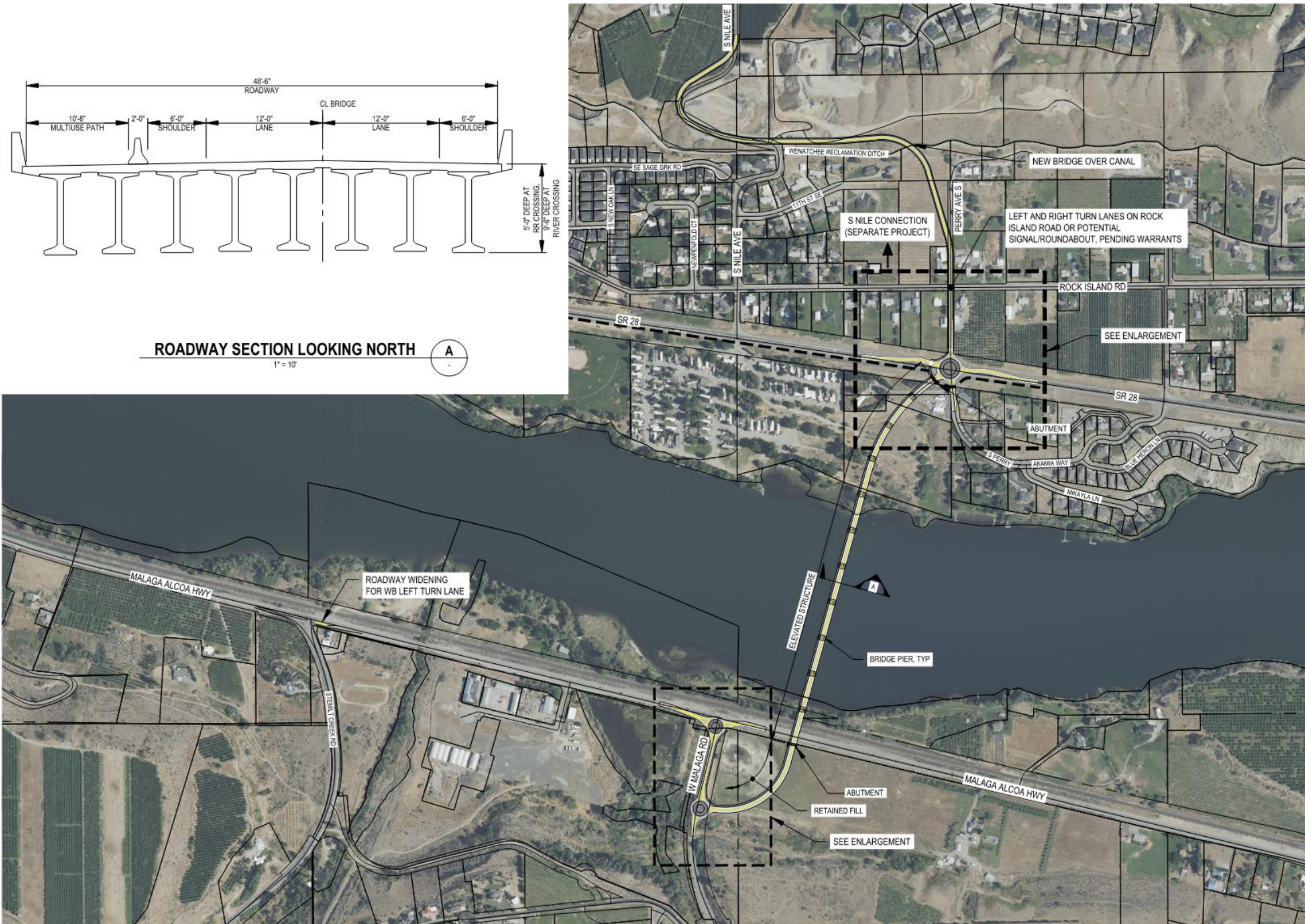
NOTE: REPRESENTATIVE CONCEPTS SUBJECT TO FURTHER PLANNING, ENGINEERING AND DESIGN. NOT ALL IMPROVEMENTS NECESSARY TO CONSTRUCT ARE SHOWN.

Figure 3-11: Representative Concept - Downtown Connection



NOTE: REPRESENTATIVE CONCEPTS SUBJECT TO FURTHER PLANNING, ENGINEERING AND DESIGN. NOT ALL IMPROVEMENTS NECESSARY TO CONSTRUCT ARE SHOWN.

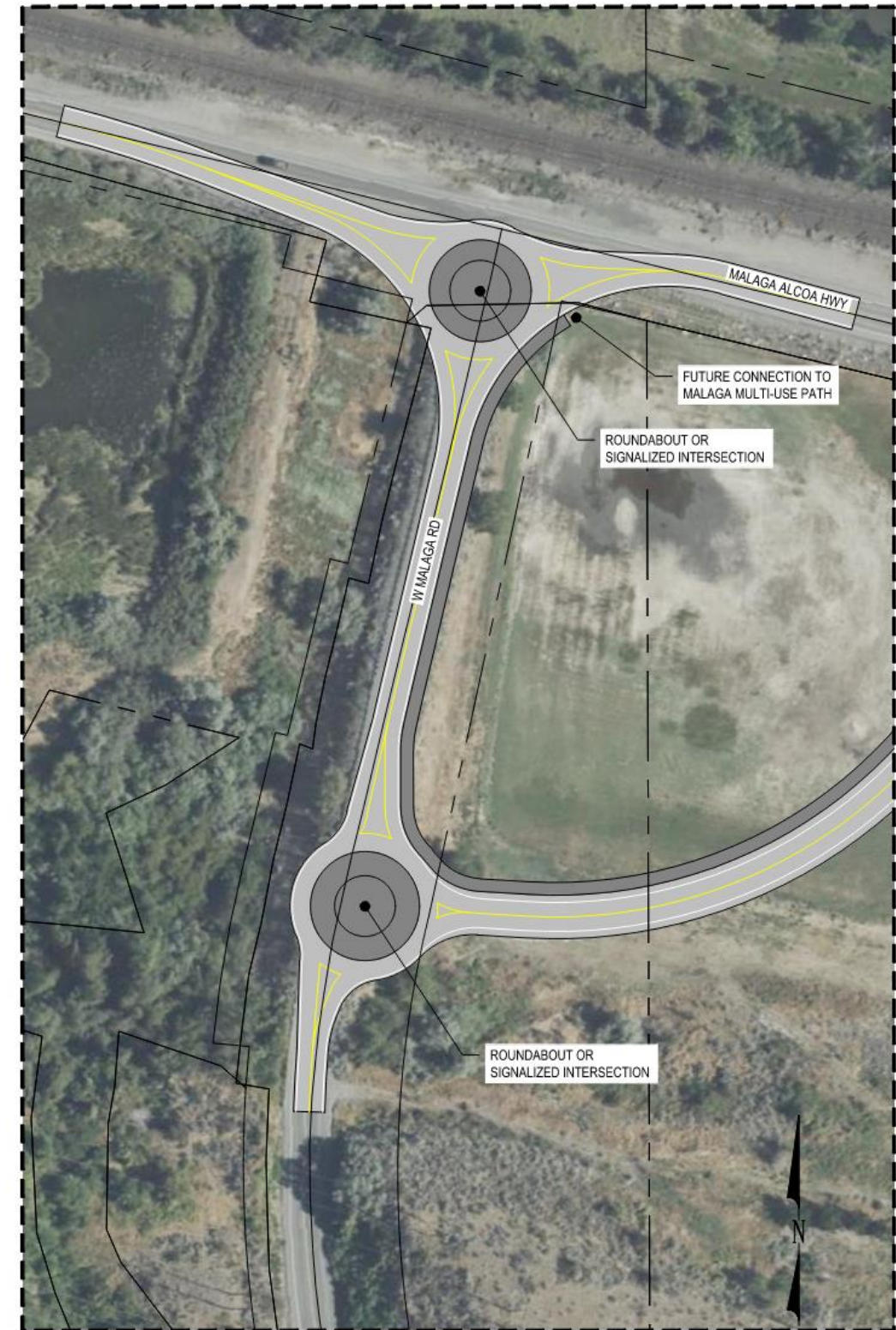
Figure 3-12: Representative Concept - SR285 Expansion



ROADWAY SECTION LOOKING NORTH A
1" = 10'

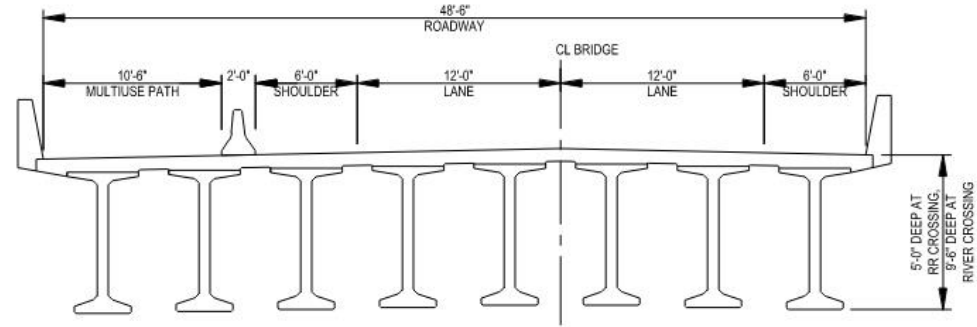
NOTE: REPRESENTATIVE CONCEPTS SUBJECT TO FURTHER PLANNING, ENGINEERING AND DESIGN. NOT ALL IMPROVEMENTS NECESSARY TO CONSTRUCT ARE SHOWN.

Figure 3-13: Representative Concept - Mid-Valley Crossing



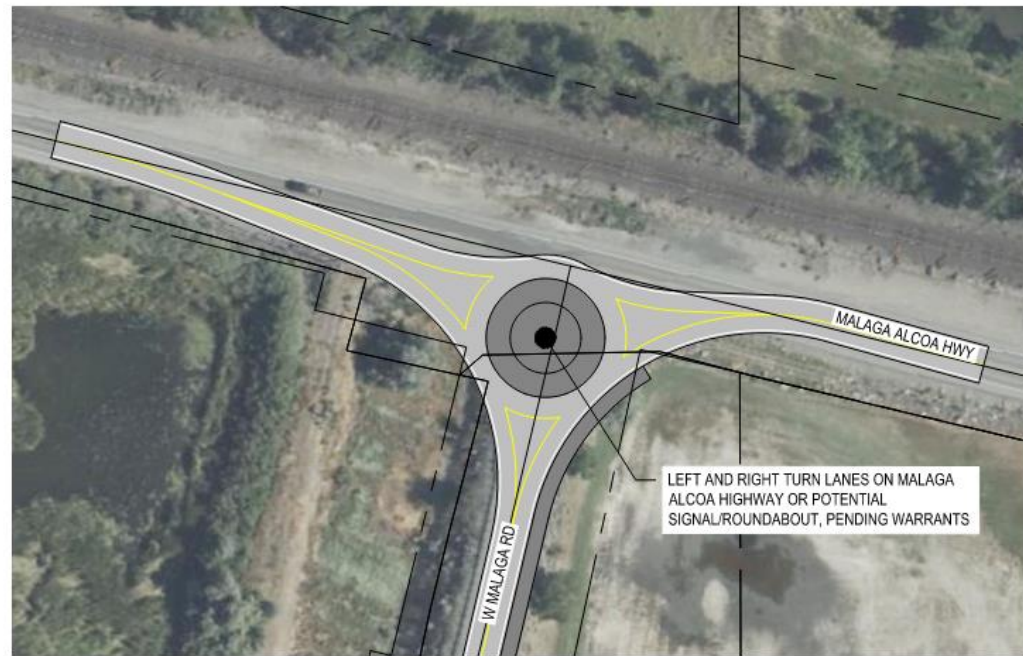
NOTE: REPRESENTATIVE CONCEPTS SUBJECT TO FURTHER PLANNING, ENGINEERING AND DESIGN. NOT ALL IMPROVEMENTS NECESSARY TO CONSTRUCT ARE SHOWN.

Figure 3-14: Mid-Valley Crossing - Intersections



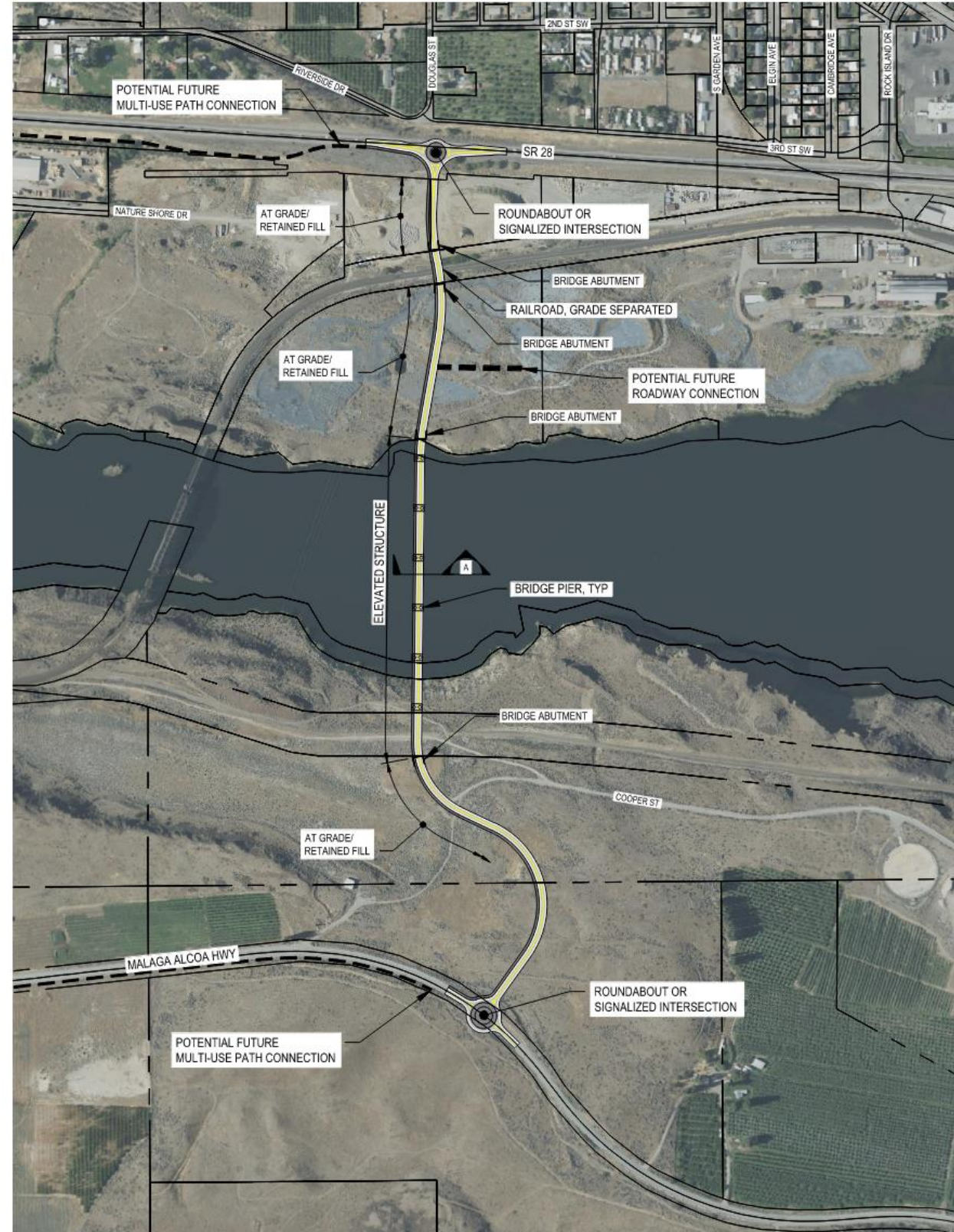
ROAD SECTION LOOKING NORTH

1" = 10'



ADDITIONAL ASSOCIATED IMPROVEMENTS

1" = 120'



NOTE: REPRESENTATIVE CONCEPTS SUBJECT TO FURTHER PLANNING, ENGINEERING AND DESIGN. NOT ALL IMPROVEMENTS NECESSARY TO CONSTRUCT ARE SHOWN.

Figure 3-15: Representative Concept - Malaga/Rock Island Industrial Area

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4. CONCEPT EVALUATION

4.1 Downtown Connection

4.1.1 Transportation/Traffic Considerations

4.1.1.1 Traffic

2050 Traffic Forecasting

The Downtown Connection is intended as an arterial-to-arterial connection to provide better and direct connections between the downtown centers of Wenatchee and East Wenatchee.

Peak hour volumes were generated for Spokane/S Wenatchee Ave and SR28/Valley Mall Pkwy connection concept. The crossing was modeled as a two-lane roadway (one lane in each direction of travel), which matched the roadway connection points on either side of the potential bridge. A “differences” plot, which shows roadway volume differences between a concept and a “no-build” scenario, was generated for the Downtown Connection concept.

The 2050 PM peak hour modeled volume differences for the potential Downtown Connection, between Spokane/S Wenatchee Ave and SR28/Valley Mall Pkwy, is illustrated in Figure 4-1.

A crossing at this location may be expected to shift approximately 1,500 vehicles during the PM peak hour from the existing SR285/Sellar Bridge to the proposed bridge location. In addition, some traffic was reallocated near the proposed bridge crossing, resulting in about 2,200 PM peak hour, or about 22,000 daily, trips crossing the river at the Downtown Connection location. Overall, the Downtown Connection concept may increase the total number of river crossings by 350 PM peak hour trips, or about 3,500 daily trips.

The reduction of traffic on the SR285 Sellar Bridge does help the overall traffic performance on the bridge. However, the reductions are not significant enough to reduce the volume-to-capacity (v/c) ratio below a 1.0 for both directions of travel. The modeling also shows that improvements may be needed to localized intersections as part of the Downtown Connection to facilitate the redistribution of traffic.

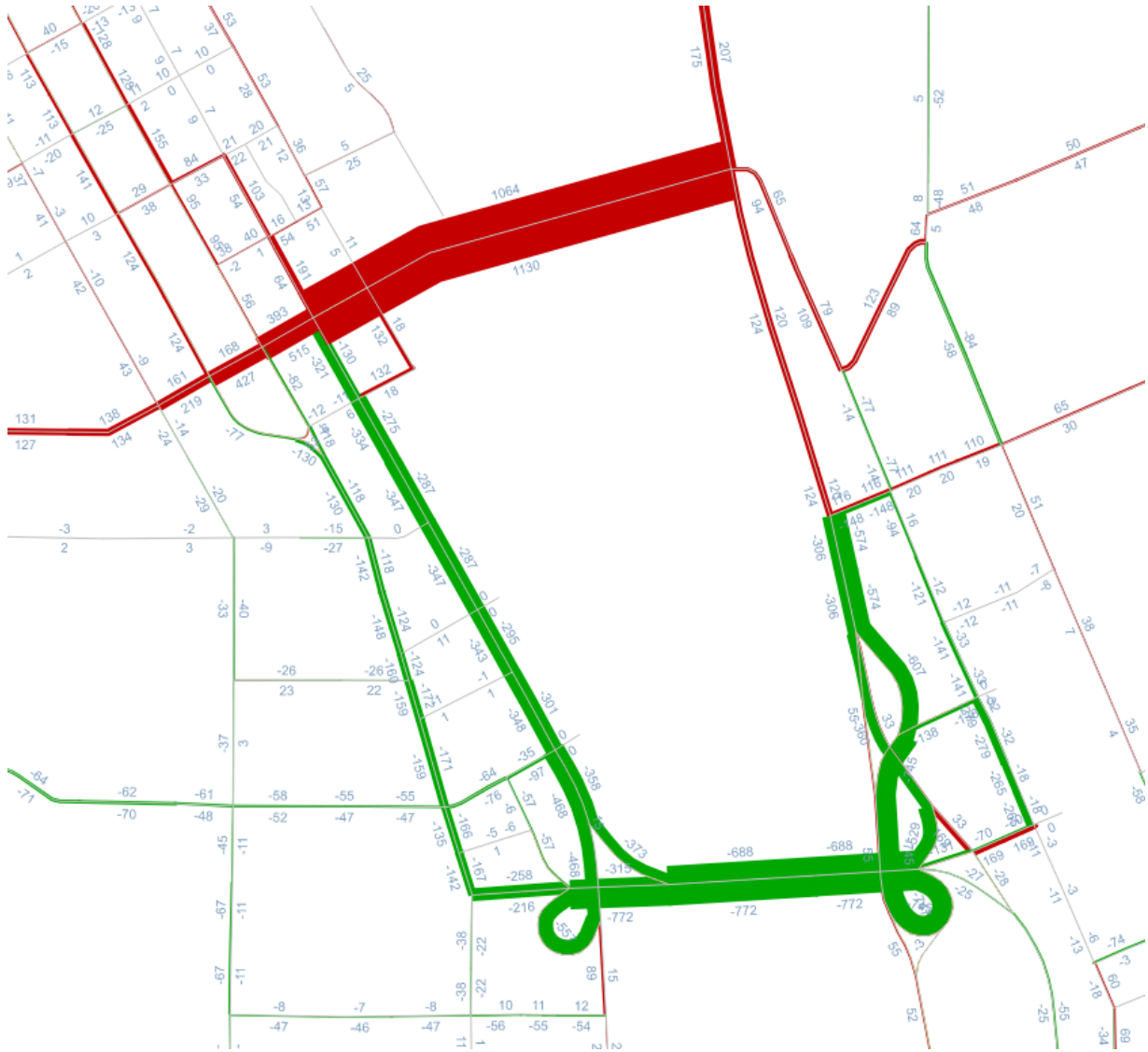


Figure 4-1: 2050 PM Peak Hour Volumes – Downtown Connection

Traffic and Transportation Enhancements

In addition to the new Downtown Connection bridge, the intersection of Spokane St and Wenatchee Ave is likely to require traffic signal modifications, including additional detection, traffic signal timing, and potentially revised lane configurations, to accommodate the projected traffic volumes.

New traffic signals are also likely needed, pending signal warrants under the Manual on Uniform Traffic Control Devices (MUTCD), at the intersections of Spokane St with Mission St and Chelan Ave. The traffic signals are likely needed to accommodate the turning movements that are expected to be generated by the new bridge crossing. In addition, coordinated traffic signal timing along the Chelan Ave, Mission St, and Wenatchee corridors, both north and south of Spokane St, will likely need to be revised or implemented to facilitate and enhance traffic flow.

The Downtown Connection concept connects to Valley Mall Pkwy. It is anticipated that a new roundabout would be constructed at the intersection of SR28 and Valley Mall Pkwy. In addition, striping and pedestrian crossing enhancements are likely needed on Valley Mall Pkwy, south of the proposed roundabout, to further facilitate multimodal movements.

SR28 is expected to facilitate additional vehicular traffic with the Downtown Connection and may require additional signing and striping for lane allocations as well as roadway lighting to enhance the safety. The intersection of SR28 with 5th St, or the roundabout serving the Valley Mall, may need a modification to accommodate the additional trips being reallocated. The modification could include a northbound right-turn slip lane, allowing traffic going northbound to the proposed bridge additional capacity.

4.1.1.2 Freight

Freight would be able to access the Downtown Connection, however it is not expected to impact regional freight accessing SR285 or SR28.

4.1.1.3 Transit

The Downtown Connection is an attractive option for transit by opening up the possibility to a new route with more direct connectivity from Wenatchee to East Wenatchee and the Wenatchee Valley Mall area in particular. The approach on the Wenatchee side is conveniently located near the Columbia Station Transit Center and combined with Transit priority improvements on the route between the bridge and the Transit Center this option could have a noted benefit to transit. A new bridge in this location could also result in rerouting one or two bus routes off of the George Sellar Bridge thereby reducing the congestion load on that bridge. While the details of the type of intersection improvements would need to be evaluated in a design phase, a roundabout option on the SR28/ Valley Mall Pkwy side would work well for transit speed and reliability.

4.1.1.4 Active Transportation

The Downtown Connection is intended to represent an arterial-to-arterial type of connection. The bridge roadway section would have a similar cross-section as other arterial streets. The typical layout for active transportation in downtown Wenatchee consists of designated bike lanes adjacent to the vehicular travel lanes and raised sidewalks. The sidewalks and bike lane extend across the bridge to a new intersection with SR28 and Valley Mall Pkwy. The future design would include extending the pedestrian and bike connections from the bridge through to Valley Mall Pkwy. Active transportation connections to SR28 itself would be de-emphasized as it is not currently intended to be the bicycle or pedestrian route since the Apple Capital Recreation Loop serves as the designated parallel active transportation route.

The new bridge as shown crosses over the Apple Capital Recreation Loop Trail to maintain separation between the trail and vehicular traffic. In the concept shown, the trail would need to be reconstructed at a lower elevation to pass under the new bridge approach. The current concept doesn't show a direct connection from the bridge to the Apple Capital Recreation Loop but that may be a design feature that should be evaluated with any future plans for a bridge in this area.

4.1.2 Structural Considerations

4.1.2.1 Bridge

There are multiple constraints and factors at this crossing location that influence the roadway/bridge profile, pier locations, overall layout, and construction costs. These include:

- **BNSF & Spur Tracks:** Along the western bank of the Columbia, BNSF currently operates multiple mainline and spur tracks that will need to be crossed by the bridge structure. The minimum vertical clearance over their right-of-way is 23.5-feet as measured from the top of the highest rail to the lowest part of structure. This results in the roadway profile needing to stay high over the track prior to descending to Wenatchee Ave. A preliminary evaluation of the profile indicated that it is likely feasible to make this connection but that shorter span lengths could be used which allow for shallower structural depth.
- **Utilities:** Immediately adjacent to the western bridge approach are multiple overhead power lines and the Chelan County PUD Wenatchee Switchyard. Construction adjacent these facilities will likely require some utility relocation and or avoidance.
- **Apple Capital Loop Trail:** At the eastern approach, the bridge structure will cross over the regional trail as it descends to meet State Route 28. Access to and vertical clearance over the trail will need to be maintained.
- **Construction Considerations:** Construction at this location will occur in areas that are already well developed, particularly on the west side of the river. Laydown areas will be required to stage materials and equipment necessary for construction and for the final structure. In addition to using available right-of-way, this will require some temporary and permanent property impacts that will need to be mitigated.

4.1.2.2 Walls

Given the topography and the vertical clearance constraints mentioned previously, most walls for this crossing are likely to be fill-type walls. These are typically constructed using Mechanically Stabilized Earth or CIP concrete retaining walls. If geotechnical conditions are poor, ground improvements and/or deep foundations for these walls may be required.

4.1.3 Capital and Life-Cycle Costs

4.1.3.1 Capital Cost Summary

Planning level cost estimates were developed for each representative crossing location. Costs were based on high-level estimates for the infrastructure, design, permitting and additional right of way costs. Estimates cover the bridge structure and connecting roadways, trails, utility modifications and intersection improvements anticipated adjacent to the bridge crossing. Also included are estimates for intersection improvements that would be needed elsewhere in the corridor to improve functionality at the bridge. Due to the conceptual level understanding of the project, a 30% contingency is added to the base estimate. Cost estimates are shown in today's dollars, which for this study is first quarter 2024. The table below shows a breakdown of the major cost categories. The total costs are shown as a range starting as 20% lower than the base estimate to 40% higher. These cost estimates have been

developed based on the representative crossing concept shown. Future design development may result in a different configuration which may have significant impacts on project cost estimates.

Towards the end of this study, we were made aware that Chelan County PUD does have plans to expand their existing substation further north into the area where the bridge is shown in concept. The cost estimate prepared for this study does not include estimated costs to mitigate for that potential future condition.

DOWNTOWN CROSSING: PLANNING-LEVEL COST BREAKDOWN	
CONSTRUCTION COSTS	\$128,900,000
PROFESSIONAL SERVICES	\$64,750,000
RIGHT OF WAY	\$180,000
TOTAL	\$193,830,000
PLANNING-LEVEL RANGE (80% - 140%)	\$156 - \$272 MILLION

4.1.3.2 Life Cycle Cost Considerations

Life cycle costs will be proportionate to the amount of proposed infrastructure for each alternative. These costs will be further increased based on proportion of bridge structure and retaining walls relative to the total project footprint. The design life for both steel and concrete bridge structures per AASHTO is 75 years. In general, concrete structures require less routine/preventative maintenance when compare to steel which typically requires repainting every 25-30 years. In arid environments like this one, consideration can be given to using weathering steel in lieu of painted steel. This type of steel forms a protective patina, over time which does not require regular maintenance.

For the purposes of this alternatives analysis, concrete bridges are assumed as they typically offer better long-term performance and lower life-cycle costs for the span lengths and superstructure types considered. Future phases of design should give consideration to using steel as the primary bridge material, particularly if span lengths need to increase based on environmental, navigational and other project constraints. Additionally, consideration should be given to adopting longer design life cycle criteria (e.g. 100 years or more) for portions of the structures that may be cost prohibitive to repair or replace (i.e. the main spans of the river crossing).

4.1.4 Environmental Considerations

4.1.4.1 Environmental Resources

Sensitive Species and Habitats

Endangered Species Act Listed Species and Essential Fish Habitat

The US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) species list (2023) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Protected Resources App (2023) collectively identified 7 Endangered Species Act (ESA) listed species with the potential to occur within the Downtown Connection bridge site. Additionally, the entire Upper Columbia River watershed is identified Essential Fish Habitat for Chinook and Coho Salmon.

The conceptual alignment of the Downtown Connection bridge includes seven support pier locations that would be placed within the Columbia River. These pier locations and the overwater structure of the bridge have the potential to result in impacts to ESA listed fish species and their Critical Habitat, including Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead. To properly assess the impacts related to bridge construction and its continued existence and operation to ESA listed species, a biological assessment would need to be developed to facilitate Section 7 Consultation under the ESA. Additionally, the biological assessment would need to address any impacts to Essential Fish Habitat to facilitate the identification of applicable conservation measures.

WDFW Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) list (2023) and the State Wildlife Action Plan identify 24 species and shrubsteppe habitat which have the potential to occur within the vicinity of the Downtown Connection bridge site.

The location of the conceptual bridge and the highly disturbed urban environment in the vicinity of the Downtown bridge location, limits the potential for suitable habitat for the PHS listed species. However, nearshore and aquatic impacts related to the construction and continued use of the bridge may have the potential to impact species or habitats identified. To assess any potential impacts, species and habitat surveys will be needed to identify the presence or absence of any WDFW listed species or habitats within the vicinity of the bridge location. Based on aerial and street view imagery, a small portion of the conceptual project footprint may contain shrubsteppe habitat, though a site visit by a qualified professional will be needed to verify the presence or absence of any potential shrubsteppe habitat. A Habitat Management Plan will likely need to be prepared utilizing data gathered during onsite species and habitat surveys to identify and address any potential impacts to WDFW identified species and habitats, and to define any mitigation measures that may be required based on the level of impacts resulting from the bridge construction.

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) identified 16 bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act with the potential to occur within the vicinity of the Downtown Connection bridge site.

Due to the highly developed area in the vicinity of the bridge crossing, habitat for the listed bird species is limited. However, the bridge location is in the vicinity of the Pacific Flyway and as such, there is the potential for each bird species to occur within the vicinity of the project footprint. A qualified

professional will be required to perform a survey to confirm or deny the presence of any migratory birds in the vicinity of the project footprint. Additionally, avoiding construction activities within the breeding season (April 1-August 31 for most species) will further reduce any potential conflicts or impacts to these species.

Aquatic Resources

The National Wetland Inventory (NWI) Mapper tool identified 3 aquatic resources within the vicinity of the Downtown Connection bridge site. Aquatic resources identified within the vicinity included the Columbia River and riverine stream features on both sides of the river (see Appendix B for the NWI Map). Both features on either side of the river terminate at the Columbia River, approximately at the location where the Old Wenatchee Bridge meets the riverbank to the south. Within the Downtown location, the width of the Columbia River is estimated to range from approximately 1,450 to 1,500 feet from the Ordinary High Water Mark (OHWM).

The current proposed alignment of the Downtown Connection bridge includes seven support pier locations that would be placed within the Columbia River. Aquatic resources within the Columbia River have the potential to have direct temporary and permanent impacts within the project footprint due to construction of these pier locations. Additionally, a new bridge location has the potential to result in water quality and hydraulic impacts to the river.

An Aquatic Resource Delineation will be necessary to identify the presence or absence of aquatic resources in the project area, and to delineate their respective boundaries and associated buffers. This delineation will facilitate the development of a combined Shoreline Impact Assessment and Habitat Management Plan which will detail any impacts to aquatic resources and any required mitigation measures necessary to maintain or uplift the ecological value of the impacted aquatic resources, riparian areas, and associated buffers.

Cultural Resources

The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the Downtown Connection bridge site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. Additionally, the Downtown Wenatchee Historic District, which is listed in the National Register of Historic Places (NRHP) and the Washington Heritage Register, is located northwest of the study area for the Downtown Connection bridge site.

The conceptual Downtown Connection bridge alignment has the potential to impact to several buildings on the western side of the river. Being that the Downtown Wenatchee Historic District is located approximately 850 feet to the northwest, it is possible that buildings in the vicinity of the project footprint have the potential to be considered historic in nature. To identify if cultural resources or historic structures are present within the vicinity of the project and if they will be impacted, a cultural resources survey conducted by a qualified archaeologist and/or architectural historian will be required. If any adverse impacts to any identified cultural resources are unavoidable, proper mitigation measures will need to be identified and implemented as part of the project.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Downtown Connection bridge site. The site is predominantly located in Douglas County (Census Tract 9505) and Chelan County (Census Tract 9610.02).

Preliminary review of this socioeconomic data suggests that construction of a Downtown Connection bridge is not expected to have any significant or disproportionate socioeconomic impacts to low income or minority groups or on the residents of Douglas and Chelan Counties. If acquisition of real property or displacement of persons is required to construct a bridge in this location, the policies set forth in 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, will need to be followed and adhered to during development and implementation of the project.

Soils and Farmland Classification

Soils information and associated farmland classifications for the Downtown Connection bridge site obtained from the NRCS Web Soil Survey indicated that the area contains soils that are considered Prime farmland, Farmland of Statewide Importance, and Farmland of Unique Importance. However, much of the land areas considered to be farmland by NRCS Web Soil Survey are previously developed urban areas and no longer qualify as Prime farmland, Farmland of Statewide Importance, or Farmland of Unique Importance. Therefore, the construction of a Downtown Connection bridge is not anticipated to result in impacts to farmlands.

Sensitive Lands

Hale Park, located on the west bank of the Columbia River and to the south of the downtown site, was identified as a park that has received federal funding in the past. Wenatchee Riverfront Park and Walla Walla Point Park occur north of the Downtown Connection site along the west bank of the Columbia River and were identified as areas of concern by Chelan County PUD during informal coordination. The Apple Capital Recreation Loop Trail parallels the east and west bank of the Columbia River within the Downtown Connection bridge site study area. All of the aforementioned recreation areas will require consideration and analysis under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303) to ensure construction of a Downtown Connection bridge will not adversely affect the activities, features, or attributes of any Section 4(f) resources.

4.1.4.2 NEPA/SEPA and Permitting

Any new or expanded bridge crossing will ultimately require funding and approvals from federal, state, and local government agencies and require compliance and reviews under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). The anticipated level of NEPA review and documentation associated with construction of a Downtown Connection bridge is an Environmental Assessment (EA). However, if any significant adverse impacts to environmental resources are discovered to occur as a result of the project, the level of NEPA review may be elevated to an Environmental Impact Statement (EIS). Pursuant to WAC 197-11-610, Washington State lead agencies may adopt the environmental analysis prepared under NEPA in place of preparing an environmental checklist under SEPA.

Beyond the base need for NEPA and SEPA compliance, construction of a Downtown Connection bridge would require obtaining various permits and associated regulatory clearances with various federal, state, and local government entities. Table 4-1 below lists the various environmental permits and regulatory clearances that are anticipated to be required.

Table 4-1: Anticipated Environmental Permitting and Associated Regulatory Clearances

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act	The discharge of dredged and/or fill material into waters of the US.
WA Department of Ecology (DOE)	Section 401 of the Clean Water Act State Water Pollution Control Act	Discharges into Waters of the US and Waters of the State, including wetlands.
US Coast Guard (USCG)	Section 9 of the Rivers and Harbors Act of 1899 General Bridge Act of 1946	Bridges crossing navigable waters of the US.
USFWS and NOAA Fisheries	Section 7 of the ESA	Effects to ESA listed species.
WA DAHP State Historic Preservation Office	Section 106 of the NHPA	Effects to cultural resources/historic properties.
WA Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval	Work in or near state waters.
Local Government (City of Wenatchee, City of East Wenatchee/)	Shoreline Management Act Critical Areas Ordinances	Work within 200 feet of the shoreline of a water of the state and/or critical areas.
Chelan County PUD	Rock Island License, Article 412(d)	Crossing of "Project Waters" within the FERC licensed boundaries of Rock Island Dam

4.1.5 Property and Land Use Considerations

A high-level property and land use assessment was conducted for each of the four crossing alignments: Downtown Connection, SR285 Expansion, Mid-Valley Crossing, and Malaga/Rock Island Industrial Area. Each assessment includes the number of parcels potentially impacted, total acreage, land use, and potential cost of parcel acquisition. Chelan and Douglas County assessor's maps were used to review ownerships, land use, and assessed values of private land.

The Downtown Connection is the most constrained in terms of available space for the footprint, as the alignment would bisect the business core of both the City of Wenatchee and City of East Wenatchee. However, the alignment is not anticipated to require a full acquisition of any parcels and is largely contained within the public right-of-way of Spokane Street. Similarly, the alignment for the East Wenatchee side is also largely within existing right-of-way as well as being surrounded by Chelan PUD parcels. Temporary easements may be required to complete the construction and/or provide construction laydown areas.

The Apple Capital Loop Trail is near the east bridge approach and will need to be realigned to maintain adequate vertical clearance from the new bridge.

Chelan County PUD plans to expand the existing Wenatchee substation that may affect this alignment's feasibility. The substation expansion also implies that the parcel may not be available for acquisition.

To estimate costs, total square acreage was calculated based on potentially impacted parcels within the alignment footprint. A 1.4 contingency factor and \$75,000 flat fee for permitting and acquisition were applied, providing a conservative planning-level estimate. This alignment also includes an additional slip lane for the SR28 entrances/exits, which adds another \$15,000 to the total ROW cost estimates. On the East Wenatchee side, the estimated acreage needed is 0.21 acres from two parcels with a total estimated cost of about \$19,000. On the Wenatchee side, there are four potentially impacted parcels totaling 0.58 acres, that may roughly equate to \$66,000 if partial acquisition is acceptable. The total adjusted property costs are about \$175,000 for the Downtown Connection.

Table 4-2 displays the estimated costs of property necessary for the Downtown Crossing.

Table 4.2: Potential Acquisition Costs

Total Number of Parcels Affected	Total Acres Assumed for ROW Acquisition	Total Estimated Cost
East Wenatchee / Douglas County		
2	0.207	\$19,000*
Wenatchee / Chelan County		
4	0.583	\$66,000*
Flat Fee Cost:		\$75,000
Additional Improvement		\$15,000
Adjusted Total Estimated Cost (Rounded)		\$175,000

**Contingency factor applied to total estimated cost*

4.2 SR285 Expansion

4.2.1 Transportation/Traffic Considerations

4.2.1.1 Traffic

2050 Traffic Forecasting

The SR285 Expansion is intended to provide better highway flows for the main travel corridor through Wenatchee and East Wenatchee. The SR285 Expansion would include a new bridge structure, immediately south of the existing bridge, and would accommodate four (4) travel lanes. With the proposed new bridge in place, a couplet system would be developed such that the existing bridge would become the westbound travel lanes and the new bridge would become the eastbound travel lanes. The couplet bridge capacity modeled was 4,500 vehicles per hour.

The traffic modeling prepared for this concept assumed that ramp connections would be provided on the east side of the river and traffic signal connections would be provided on the west side of the river. A “differences” plot, which shows roadway volume differences between a concept and a “no-build” scenario, was generated for the SR285 Expansion concept. The 2050 PM peak hour modeled volume differences for the potential SR285 Expansion concept are illustrated in Figure 4-2.

The SR285 Expansion concept is expected to shift approximately 3,400 eastbound vehicles during the PM peak hour, or about 34,000 daily vehicles, from the existing SR285/Sellar Bridge to the proposed bridge location. This shift includes a slight increase of 200 PM peak hour trips from the in the eastbound travel direction. In addition, some traffic was reallocated near the proposed bridge crossing, resulting in about 300 additional westbound trips crossing the river at the existing bridge than under the Baseline conditions. Overall, the SR285 Expansion concept may increase the total number of river crossings by approximately 320 PM peak hour trips, or about 3,200 daily trips.

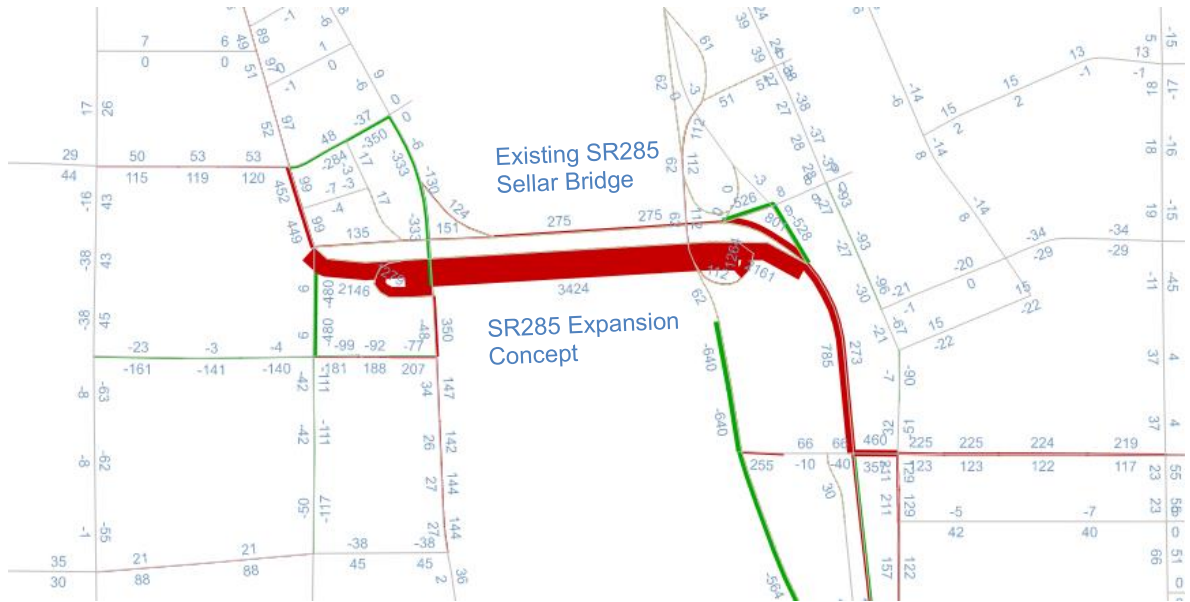


Figure 4-2: 2050 PM Peak Hour Volumes – SR285 Expansion

Traffic and Transportation Enhancements

In addition to the SR285 Expansion bridge, the intersection of SR285 and Mission St will require traffic signal modifications, including lane reallocation through striping to match the number of lanes on and off the new and existing bridges, additional detection, traffic signal head changes, and additional signage. Traffic signal timing at this intersection will also need to be evaluated and alternate signal timing implemented to facilitate the revised turning movements via any lane modifications.

To the south of SR285, within the City of Wenatchee, the intersections of Marr St with Mission St and Wenatchee Ave are expected to meet MUTCD warranting criteria for traffic signals. In addition, the SR285 Eastbound On-Ramp connection with Wenatchee Ave is anticipated to meet traffic signal warrants with the construction of the SR285 Expansion bridge. It is anticipated that new traffic signals would be implemented at these intersections, with Intelligent Transportation Systems (ITS) connections provided to the SR285/Mission intersection for coordination purposes to enhance traffic flow. Each of the new traffic signals would be designed to accommodate bicycles and pedestrians.

To the north of SR285, within the City of Wenatchee, the existing signalized intersections of Ferry St with Mission St, Crescent St, and Wenatchee Ave are anticipated to need modifications, including striping and lane reallocation, signage, detection modifications, and traffic signal timing changes.

Corridor traffic signal timing along the Mission St and Wenatchee Ave corridors, both north and south of SR285, will likely need to be revised or implemented to facilitate and enhance traffic flow. Coordinated timing plans on Ferry St and Marr St will also help facilitate traffic movements with the implementation of the SR285 Expansion concept.

In the City of East Wenatchee, the intersection of SR28 and Grant Road will likely require traffic signal modifications, including lane reallocation, detection modifications, signing changes, and traffic signal timing enhancements. The configuration of Grant Road to the west, connecting to SR28, will likely need lane reallocation as well, pending design details. This concept eliminates the direct access to Fred Meyer, and causes eastbound traffic going to Fred Meyer to otherwise utilize the SR28/Grant Road intersection. In addition, it's likely that intersection enhancements will be needed at the SR28/Grant Road intersection west of Fred Meyer to accommodate the new traffic assignments. Traffic signal timing along the Grant Road corridor, from SR28 to Highline Drive, will also be needed to promote platooning and traffic flow in the closely spaced signalized corridor.

To help facilitate the newly routed traffic and help the efficiency of the SR285/Grant Rd intersection, a third northbound travel lane connecting into the 5th St NE roundabout is recommended for implementation. The third northbound lane will help the throughput of the SR285 and will aid in providing optimal lane balancing at the intersection.

4.2.1.2 Freight

Regional freight is improved by the SR285 couplet concept. V/c ratios are improved with the couplet concept compared to the No-Build, or the Baseline, conditions. As such, freight travel delay would be reduced with this concept. However, freight access to Fred Meyer is reduced due to the elimination of the eastbound-to-southbound ramp.

4.2.1.3 Transit

The George Sellar bridge is the primary route used by Link Transit to cross between the east and west sides of the river. The current transit routes are configured for that crossing so few modifications would occur if a parallel bridge were added. Desired outcomes for adding a parallel bridge in this location would be a resultant reduction in congestion which would increase the transit service speed and reliability during the peak hour commutes. Additional bridge capacity combined with improvements in the circulation to and from the bridge on the Wenatchee side would help improve speed and reliability and buffer the impacts of population growth. Future considerations could be given to exploring transit-only lanes if warranted.

The high-level concept prepared for a parallel bridge was shown as removing the eastbound to southbound slip lane to SR28 on the west side of Fred Meyer. That route is used by transit to access a bus stop for Fred Meyer in the southwest corner of the parking lot. Future design considerations would take a closer look at the feasibility and benefits of keeping that slip lane and/or other transit routing options to maintain Transit access for users.

4.2.1.4 Active Transportation

The existing George Sellar Bridge has a separated bike pedestrian path on the south side of the bridge and well-developed connections to multi-use paths on both sides of the river. The concept

shown maintains all pedestrian routes on the existing bridge and would seek to maintain all the existing connections between the bridge and the other multi-use paths. Additional vehicular trips may make active transportation opportunities more challenging on Mission St and Wenatchee Ave in Wenatchee.

4.2.2 Structural Considerations

4.2.2.1 Bridge

At this crossing location, there are multiple constraints and factors that influence the roadway/bridge profile, pier locations, overall layout, and construction costs. These include:

- **BNSF Tracks:** Along the western bank of the Columbia, BNSF currently operates multiple mainline tracks that will need to be crossed by the bridge structure. The minimum vertical clearance over their right-of-way is 23.5-feet as measured from the top of the highest rail to the lowest part of structure. This results in the roadway profile needing to stay high over the track prior to descending to the connection at S Mission St.
- **South Wenatchee Ave:** At the western approach, the structure will need to maintain a minimum vertical clearance of 16.5-feet over the roadway below. This keeps the roadway profile/structure high as it passes over. This can be mitigated, to some degree, by using shorter bridge spans with shallower girder sections.
- **George Sellar Memorial Bridge:** Immediately adjacent to the proposed structure is the George Sellar Memorial Bridge. Pier locations for the new structure will need to be coordinated with the existing bridge piers during design and construction to avoid unintended impacts like foundation scour, settlement and vibration during installation. The plan view separation between the two structures may need to be increased to mitigate these issues which may affect the overall layout of the interchanges at each end of the bridge.
- **Construction Considerations:** Construction at this location will occur in areas that are already well developed, particularly on the west side of the river. Significant laydown areas will be required to stage materials and equipment necessary for construction and for the final structure. This will require significant temporary and permanent impacts that will need to be mitigated throughout the design and construction process.

4.2.2.2 Walls

Given the topography and the vertical clearance constraints mentioned previously, most walls for this crossing are likely to be fill-type walls. These are typically constructed using Mechanically Stabilized Earth or CIP concrete retaining walls. If geotechnical conditions are poor, ground improvements and/or deep foundations for these walls may be required.

4.2.3 Capital and Life-Cycle Costs

4.2.3.1 Capital Cost Summary

Planning level cost estimates were developed for each representative crossing location. Costs were based on high-level estimates for the infrastructure, design, permitting and additional right of way costs. Estimates cover the bridge structure and connecting roadways, trails, utility modifications and intersection improvements anticipated adjacent to the bridge crossing. Also included are estimates for intersection improvements that would be needed elsewhere in the corridor to improve functionality at the bridge. Due to the conceptual level understanding of the project, a 30% contingency is added to the base estimate. Cost estimates are shown in today's dollars, which for this study is first quarter 2024. The table below shows a breakdown of the major cost categories. The total costs are shown as a range starting as 20% lower than the base estimate to 40% higher. These cost estimates have been developed based on the representative crossing concept shown. Future design development may result in a different configuration which may have significant impacts on project cost estimates.

SR 285 EXPANSION: PLANNING-LEVEL COST BREAKDOWN	
CONSTRUCTION COSTS	\$150,000,000
PROFESSIONAL SERVICES	\$75,000,000
RIGHT OF WAY	\$1,610,000
TOTAL	\$226,610,000
PLANNING-LEVEL RANGE (80% - 140%)	\$182 - \$318 MILLION

4.2.3.2 Life Cycle Cost Considerations

Life cycle costs will be proportionate to the amount of proposed infrastructure for each alternative. These costs will be further increased based on proportion of bridge structure and retaining walls relative to the total project footprint. The design life for both steel and concrete bridge structures per AASHTO is 75 years. In general, concrete structures require less routine/preventative maintenance when compare to steel which typically requires repainting every 25-30 years. In arid environments like this one, consideration can be given to using weathering steel in lieu of painted steel. This type of steel forms a protective patina, over time which does not require regular maintenance.

For the purposes of this alternatives analysis, concrete bridges are assumed as they typically offer better long-term performance and lower life-cycle costs for the span lengths and superstructure types considered. Future phases of design should give consideration to using steel as the primary bridge material, particularly if span lengths need to increase based on environmental, navigational and other project constraints. Additionally, consideration should be given to adopting longer design life cycle criteria (e.g. 100 years or more) for portions of the structures that may be cost prohibitive to repair or replace (i.e. the main spans of the river crossing).

4.2.4 Environmental Considerations

4.2.4.1 Environmental Resources

Sensitive Species and Habitats

Endangered Species Act Listed Species and Essential Fish Habitat

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) collectively identified 7 ESA-listed species with the potential to occur within the vicinity of the SR285 conceptual bridge location. Additionally, the entire Upper Columbia River watershed is identified Essential Fish Habitat for Chinook and Coho Salmon.

The conceptual alignment of the SR285 Expansion bridge includes five support pier locations that would be placed within the Columbia River. These pier locations and the overwater structure of the bridge have the potential to result in impacts to ESA listed fish species and their Critical Habitat, including Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead. To properly assess the impacts related to bridge construction and its continued existence and operation to ESA listed species, a biological assessment would need to be developed to facilitate Section 7 Consultation under the ESA. Additionally, the biological assessment would need to address any impacts to Essential Fish Habitat to facilitate the identification of applicable conservation measures.

WDFW Priority Habitats and Species

The WDFW PHS list (2023) and the State Wildlife Action Plan collectively identify 23 species which have the potential to occur within the vicinity of the SR285 Expansion bridge site.

The location of the conceptual bridge and the highly disturbed urban environment in the vicinity of the SR285 Expansion bridge location, limits the potential for suitable habitat for the PHS listed species. However, nearshore and aquatic impacts related to the construction and continued use of the bridge may have the potential to impact species identified. To assess any potential impacts, species and habitat surveys will be needed to identify the presence or absence of any WDFW listed species within the vicinity of the bridge location. A Habitat Management Plan will likely need to be prepared utilizing data gathered during onsite species and habitat surveys to identify and address any potential impacts to WDFW identified species and habitats, and to define any mitigation measures that may be required based on the level of impacts resulting from the bridge construction.

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) was reviewed and identified 8 bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act which have the potential to occur within the vicinity of the SR285 Expansion bridge site.

Due to the highly developed area in the vicinity of the bridge crossing, habitat for the listed bird species is limited. However, the bridge location is in the vicinity of the Pacific Flyway and as such, there is the potential for each of the listed bird species to occur within the vicinity of the project footprint. A qualified professional will be required to confirm or deny the presence of any migratory birds in the vicinity of the project footprint. Additionally, avoiding construction activities within the breeding season (April 1- August 31 for most species) will further reduce any potential conflicts or impacts to these species.

Aquatic Resources

The National Wetland Inventory (NWI) Mapper tool identified 2 aquatic resources within the vicinity of the SR285 Expansion site. Aquatic resources identified within the vicinity included the Columbia River and a riverine stream feature on the east side of the river. The feature terminates at the Columbia River, approximately at the location where the current bridge alignment meets the riverbank (see Appendix B for the NWI Map). This feature is mapped on DNR Maps as an X-Type (non-typed per WAC 222-16) stream (see Appendix B for the DNR Map). The current bridge crossing at the SR285 expansion site currently spans approximately 1,000 feet across the Columbia River.

The current conceptual alignment of the SR285 Expansion bridge includes five support pier locations that would be placed within the Columbia River. Aquatic resources within the Columbia River have the potential to have direct temporary and permanent impacts within the project footprint due to construction of these pier locations. Additionally, a new bridge location has the potential to result in water quality and hydraulic impacts to the river.

An Aquatic Resource Delineation will be necessary to identify the presence or absence of aquatic resources in the project area, and to delineate their respective boundaries and associated buffers. This delineation will facilitate the development of a combined Shoreline Impact Assessment and Habitat Management Plan which will detail any impacts to aquatic resources and required mitigation measures necessary to maintain or uplift the ecological value of the impacted aquatic resources, riparian areas and, and associated buffers.

Cultural Resources

The WISAARD mapping tool lists the SR285 Expansion bridge site as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool also identifies that the existing SR285 bridge structure, referred to as the Columbia River Bridge – Stevens St (SR285 Crossing), is listed on the National Register of Historic Places (NRHP) and Washington Heritage Register.

The conceptual SR285 Expansion bridge alignment is identified as an area with the highest level of concern for the potential for cultural resources to be present per the WISAARD mapping tool. Additionally, the conceptual bridge alignment has the potential to result in the impact of several buildings on the western side of the river. Being that the SR285 Expansion bridge would be located parallel to the existing SR285 Bridge which is listed on the NRHP and the Washington Heritage Register, mitigation for impacts to the historic viewshed will likely be necessary. To identify if any additional cultural resources or historic structures are present within the vicinity of the project, a cultural resources survey conducted by a qualified archaeologist and/or architectural historian will be required. If any adverse impacts to any identified cultural resources are unavoidable, proper mitigation measures will need to be implemented as part of the project.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the SR285 Site. The site is located at the nexus of four census tracts in Douglas County (Census Tracts 9505 & 9508) and Chelan County (Census Tracts 9611.02 & 9610.02).

Preliminary review of this socioeconomic data suggests that construction of an SR285 Expansion bridge is not expected to have any significant or disproportionate socioeconomic impacts to low income or minority groups or the residents of Douglas and Chelan Counties. If acquisition of real property or displacement of persons is required to construct a bridge in this location, the policies set forth in 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, will need to be followed and adhered to during development and implementation of the project.

Soils and Farmland Classification

The NRCS Web Soil Survey notes that the SR285 location contains soils that can be considered Farmland of Unique Importance. However, majority of the land areas considered to be farmland by NRCS Web Soil Survey are previously developed urban areas and no longer qualify as Farmland of Unique Importance. Therefore, the construction of an SR 295 Expansion bridge is not anticipated to result in impacts to farmlands.

Sensitive Lands

Much of the land on either side of the river at the SR285 Expansion site primarily consists of highly developed urban areas. Hale Park, located on the west bank of the Columbia River and to the north of the SR285 Expansion site, was identified as a park that has received federal funding in the past. The Apple Capital Recreation Loop Trail parallels the east bank of the Columbia River within the SR285 Expansion bridge site study area. Mission St Park and Train Park on the western side of the river are located on the north and south side of Stevens St. Both parks have the potential to be impacted by the conceptual bridge crossing. Both recreation areas require consideration under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303) to ensure construction of an SR285 Expansion bridge will not adversely affect the activities, features, or attributes of any Section 4(f) resources.

4.2.4.2 NEPA/SEPA and Permitting

Any new or expanded bridge crossing will ultimately require funding and approvals from federal, state, and local government agencies and require compliance and reviews under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). The anticipated level of NEPA review and documentation associated with construction of a SR285 Expansion bridge is an Environmental Assessment (EA). However, if any significant adverse impacts to environmental resources are discovered to occur as a result of the project, the level of NEPA review may be elevated to an Environmental Impact Statement (EIS). Pursuant to WAC 197-11-610, Washington State lead agencies may adopt the environmental analysis prepared under NEPA in place of preparing an environmental checklist under SEPA.

Beyond the base need for NEPA and SEPA compliance, construction of a SR285 Expansion bridge would require obtaining various permits and associated regulatory clearances with various federal, state, and local government entities. Table 4-3 below lists the various environmental permits and regulatory clearances that are anticipated to be required.

Table 4-3: Anticipated Environmental Permitting and Associated Regulatory Clearances

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act	The discharge of dredged and/or fill material into waters of the US.
WA Department of Ecology (DOE)	Section 401 of the Clean Water Act State Water Pollution Control Act	Discharges into Waters of the US and Waters of the State, including wetlands.
US Coast Guard (USCG)	Section 9 of the Rivers and Harbors Act of 1899 General Bridge Act of 1946	Bridges crossing navigable waters of the US.
USFWS and NOAA Fisheries	Section 7 of the ESA	Effects to ESA listed species.
WA DAHP State Historic Preservation Office	Section 106 of the NHPA	Effects to cultural resources/historic properties.
WA Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval	Work in or near state waters.
Local Government (City of Wenatchee, City of East Wenatchee)	Shoreline Management Act Critical Areas Ordinances	Work within 200 feet of the shoreline of a water of the state and/or critical areas.
Chelan County PUD	Rock Island License, Article 412(d)	Crossing of "Project Waters" within the FERC licensed boundaries of Rock Island Dam

4.2.5 Property and Land Use Considerations

A high-level property and land use assessment was conducted for each of the four crossing alignments: Downtown Connection, SR285 Expansion, Mid Valley Crossing, and Malaga/Rock Island Industrial Area. Each assessment includes the number of parcels potentially impacted, total acreage, land use, and potential cost of parcel acquisition. Chelan and Douglas County assessor's maps were used to review ownerships, land use, and assessed values of private land.

For the SR285 alignment, most of the footprint on the east is within existing WSDOT owned ROW. Additionally, this alignment will provide mobility and capacity for an existing route that has a high demand and will allow direct access between two main arterials for both jurisdictions. However, this alignment is expected to have the most impact on private properties within the vicinity due to the density of the existing built environment in the City of Wenatchee.

To estimate costs, total square acreage was calculated based on potentially impacted parcels within the alignment footprint. A 1.4 contingency factor and \$105,000 flat fee for permitting and acquisition were applied, providing a conservative planning-level estimate. On the East Wenatchee side, the estimated acreage needed for the SR285 alignment is 0.02 acres from one parcel with no estimated cost. On the Wenatchee side, there are six potentially impacted parcels totaling 1.03 acres, that may roughly equate to \$1.5M. The total adjusted property costs are about \$1.6M for the SR285 Expansion.

Table 4-4 displays the estimated costs necessary for the SR285 Expansion.

Table 4-4: Potential Acquisition Costs

Total Number of Parcels Affected	Total Acres Assumed for ROW Acquisition	Total Estimated Cost
East Wenatchee / Douglas County		
1	0.02	\$0
Wenatchee / Chelan County		
6	1.03	\$1,500,000*
Flat Fee Cost:		\$105,000
Adjusted Total Estimated Cost (Rounded)		\$1,605,000

**Contingency factor was applied to total cost*

4.3 Mid-Valley Crossing

4.3.1 Transportation/Traffic Considerations

4.3.1.1 Traffic

2050 Traffic Forecasting

The Mid-Valley Crossing is intended to provide better arterial connectivity for residential development in two areas with significant projected household growth. One crossing location was modeled using the CDTC 2050 model – the Nile Avenue crossing concept. The proposed bridge concept included one lane in each direction with a connection into SR28 on the north side of the river and a connection to Malaga Alcoa Highway on the south side of the river.

A “differences” plot, which shows roadway volume differences between a concept and a “no-build” scenario, was generated for the Mid-Valley Crossing concept. The 2050 PM peak hour modeled volume differences for the potential Mid-Valley Crossing are illustrated in Figure 4-3.

The proposed Mid-Valley Crossing bridge attracted approximately 1,000 vehicles during the PM peak hour, or about 10,000 daily vehicles, while reducing traffic from the existing SR285/Sellar Bridge by approximately 600 vehicles during the PM peak hour. Overall, the Mid-Valley Crossing concept may increase the total number of river crossings by approximately 340 PM peak hour trips, or about 3,400 daily trips.

The reduction in traffic from the existing SR285/Sellar Bridge results in about a 9% reduction of future traffic. The 9% traffic reduction on the existing SR285/Sellar Bridge does improve the operations of the existing bridge, in comparison to the No-Build, or Baseline, condition. However, the Mid-Valley Crossing modeling shows the existing SR285/Sellar Bridge v/c ratio is still over a 1.0. In addition, the proposed Mid-Valley Crossing slightly reduces traffic on SR28 between the proposed bridge location and the SR285/Sellar Bridge.



Figure 4-3: 2050 PM Peak Hour Volumes – Mid-Valley Crossing

Traffic and Transportation Enhancements

The Mid-Valley Crossing is expected to require enhancements to the SR28 connection, via a roundabout, that provides access to SR28, to Perry Ave to the north, and to the nearby residential subdivision. Minor roadway widening approaching the intersection as well as signing, striping, and lighting modifications on SR28 would be needed to support this change in traffic control. To the north, at Perry Ave and Rock Island Rd, it is anticipated that a traffic signal will meet the MUTCD warrants and be required to aid in facilitating the traffic crossing the proposed Mid-Valley Crossing. Signing and marking changes along Rock Island Rd will likely be needed to support the traffic signal layout.

Roundabouts are also proposed on the south side of the Mid-Valley Crossing connections to Malaga Rd and Malaga-Alcoa Highway. These improvements are needed to help facilitate traffic and minimize the delays expected from traffic utilizing the proposed crossing. New signing, striping, and lighting would be needed at each roundabout location and along each roadway upstream of the roundabout.

Further to the west of the Mid-Valley Crossing, at Malaga-Alcoa Highway and Stemilt Creek Rd, it is anticipated that left-turn lanes will be needed as the traffic along Malaga-Alcoa Highway is expected to increase, primarily in the westbound direction of travel. This increase could lead to the need for a left-turn lane at Stemilt Creek Rd.

4.3.1.2 Freight

The Mid-Valley Crossing would provide a more direct connection to freight generators in South Wenatchee and Malaga. However, it is not expected to impact regional freight accessing SR285 or SR28.

4.3.1.3 Transit

Link Transit currently operates one bus route in this vicinity on the Douglas County side using Rock Island Rd. To continue east to Rock Island the bus needs to make a left onto SR28 and experiences delay waiting for a safe entrance. The associated intersection improvements between a new bridge and SR28 and Rock Island Rd in this vicinity would provide a general benefit to transit by providing a safer more consistent way to get to southbound SR28. Route 24 provides transit service from Wenatchee to Malaga, along Malaga-Alcoa Highway and W. Malaga Rd. A bridge in this location could provide options to connect East Wenatchee and Malaga.

There is a noted desire to improve transit service to Pangborn Airport. With a combined improvement to Nile and intersection improvements at SR28, this bridge could allow a direct connection for transit between future growth in the Malaga area and the airport.

4.3.1.4 Active Transportation

The existing Apple Capital Recreation Loop terminates at Hydro Park just over a half mile west of this concept location. Planning is active and ongoing to extend the Apple Capital Recreation Loop further south/east past this location on the Douglas County side. Similarly, there is a desire to build a multi-use path on the Malaga side past this concept location and down to the planned Malaga Waterfront park. Both of these trail networks could be constructed to connect to the new bridge. The proposed bridge section for this study includes a separated multi-use path on one side of the bridge.

4.3.2 Structural Considerations

4.3.2.1 Bridge

At this crossing location, there are multiple constraints and factors that influence the roadway/bridge profile, pier locations, overall layout, and construction costs. These include:

- **BNSF Tracks:** Along the southern bank of the Columbia, BNSF currently operates a mainline track that will need to be crossed by the bridge structure. The minimum vertical clearance over their right-of-way is 23.5-feet as measured from the top of the highest rail to the lowest part of structure. This results in the roadway profile needing to stay high over the track prior to descending to the connection at W Malaga Rd.
- **Topography at Northern Approach:** As the bridge approaches State Route 28 from the south, the grades descend quickly from the highway down to the riverbank. While road embankment

could be used to support the roadway along the north side of the river, the embankment would be as high as 70-feet above the adjacent grade. The sheer scale of the embankment may make it cost-prohibitive to construct and would have significant visual impacts. Additionally, this amount of fill could have impacts to the hydraulic performance of the Columbia River, particularly during flood flows. Because of this, an elevated structure is assumed for nearly the entire roadway length. This results in higher overall structural costs.

- **Construction Considerations:** Construction at this location will occur primarily in undeveloped areas. This will provide easier access and laydown areas for the Contractor to stage equipment and materials. This will keep temporary and permanent impacts smaller than in other alternatives that are in more developed areas.

4.3.2.2 Walls

Given the topography and the vertical clearance constraints mentioned previously, most walls for this crossing are likely to be fill-type walls. These are typically constructed using Mechanically Stabilized Earth or CIP concrete retaining walls. If geotechnical conditions are poor, ground improvements and/or deep foundations for these walls may be required.

4.3.3 Capital and Life-Cycle Costs

4.3.3.1 Capital Cost Summary

Planning level cost estimates were developed for each representative crossing location. Costs were based on high-level estimates for the infrastructure, design, permitting and additional right of way costs. Estimates cover the bridge structure and connecting roadways, trails, utility modifications and intersection improvements anticipated adjacent to the bridge crossing. Also included are estimates for intersection improvements that would be needed elsewhere in the corridor to improve functionality at the bridge. Due to the conceptual level understanding of the project, a 30% contingency is added to the base estimate. Cost estimates are shown in today's dollars, which for this study is first quarter 2024. The table below shows a breakdown of the major cost categories. The total costs are shown as a range starting as 20% lower than the base estimate to 40% higher. These cost estimates have been developed based on the representative crossing concept shown. Future design development may result in a different configuration which may have significant impacts on project cost estimates.

MID-VALLEY CROSSING: PLANNING-LEVEL COST BREAKDOWN	
CONSTRUCTION COSTS	\$154,100,000
PROFESSIONAL SERVICES	\$77,100,000
RIGHT OF WAY	\$1,030,000
TOTAL	\$232,230,000
PLANNING-LEVEL RANGE (80% - 140%)	\$186 - \$326 MILLION

The mid-valley crossing location shown in the concept would be accessible to more vehicles if a direct connection was made to continue up the hill via a reconfigured South Nile Ave. The current alignment for South Nile Ave as it traverses the hill poses challenges to large trucks as the s-curves in the roadway are too tight to allow for the large trucks to maneuver within their lane. In addition to the s-curve challenges, the existing bridge over the Wenatchee Reclamation Ditch is not load rated to handle heavy trucks. This study has conceptualized a reconfiguration of South Nile Ave which increases the radii of the s-curves and provides a new bridge over the Wenatchee Reclamation Ditch. The road continues to South Perry Ave and Rock Island Rd allowing for a direct continuation on to the new bridge crossing and intertie to SR28. The high-level concept still showed some challengingly steep grades to traverse from Perry Ave South and Rock Island Rd up to the elevation needed to get over the Wenatchee Reclamation Ditch. A reconfiguration to South Nile Ave is not integral to the representative bridge crossing in this location so the costs to reconstruct that roadway have not been included in the estimate above. A high-level estimate for this roadway reconstruction/reconfiguration is estimated to be between \$12 million and \$21 million.

4.3.3.2 Life Cycle Cost Considerations

Life cycle costs will be proportionate to the amount of proposed infrastructure for each alternative. These costs will be further increased based on proportion of bridge structure and retaining walls relative to the total project footprint. The design life for both steel and concrete bridge structures per AASHTO is 75 years. In general, concrete structures require less routine/preventative maintenance when compare to steel which typically requires repainting every 25-30 years. In arid environments like this one, consideration can be given to using weathering steel in lieu of painted steel. This type of steel forms a protective patina, over time which does not require regular maintenance.

For the purposes of this alternatives analysis, concrete bridges are assumed as they typically offer better long-term performance and lower life-cycle costs for the span lengths and superstructure types considered. Future phases of design should give consideration to using steel as the primary bridge material, particularly if span lengths need to increase based on environmental, navigational and other project constraints. Additionally, consideration should be given to adopting longer design life cycle criteria (e.g. 100 years or more) for portions of the structures that may be cost prohibitive to repair or replace (i.e. the main spans of the river crossing).

4.3.4 Environmental Considerations

4.3.4.1 Environmental Resources

Sensitive Species and Habitats

Endangered Species Act Listed Species and Essential Fish Habitat

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) collectively identified 7 ESA-listed species which have the potential to occur within the vicinity of the conceptual Mid-Valley Connection crossing site. Additionally, the entire Upper Columbia River watershed is identified Essential Fish Habitat for Chinook and Coho Salmon.

The conceptual alignment of the Mid-Valley Connection bridge includes seven support pier locations that would be placed within the Columbia River. These pier locations and the overwater structure of the bridge have the potential to result in impacts to ESA listed fish species and their Critical Habitat,

including Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead. To properly assess the impacts related to bridge construction and its continued existence and operation to ESA listed species, a biological assessment would need to be developed to facilitate Section 7 Consultation under the ESA. Additionally, the biological assessment would need to address any impacts to Essential Fish Habitat to facilitate the identification of applicable conservation measures.

WDFW Priority Habitats and Species

The WDFW PHS list (2023) and the State Wildlife Action Plan collectively identify 27 species and Freshwater Forested/Shrub Wetland habitat that have the potential to occur within the study area.

The conceptual alignment of the Mid-Valley Connection bridge has the potential to overlap with wetland habitat on the south side of the river. To assess any potential impacts, species and habitat surveys will be needed to identify the presence or absence of any WDFW listed species or habitats within the vicinity of the bridge location. Based on aerial and street view imagery, a small portion of the conceptual project footprint may contain wetland habitat, though a site visit by a qualified professional will be needed to verify the presence or absence of any potential wetland habitat. A combined Habitat Management Plan and Shoreline Impact Assessment will likely need to be prepared utilizing data gathered during onsite species and habitat surveys to identify and address any potential impacts to WDFW identified species and habitats, and to define any mitigation measures that may be required based on the level of impacts resulting from the bridge construction.

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) identified 16 bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act with the potential to occur within the vicinity of the Mid-Valley Connection bridge location.

Due to the moderately undeveloped nature of the project vicinity, specifically on the southern side of the river, it is possible that the listed bird species identified have the potential to occur within the vicinity of the project. This is amplified by the fact that the bridge location is in the vicinity of the Pacific Flyway. A survey by a qualified professional will be required to confirm or deny the presence of any migratory birds in the vicinity of the project footprint. Additionally, avoiding construction activities within the breeding season (April 1-August 31 for most species) will further reduce any potential conflicts or impacts to these species.

Aquatic Resources

There is one riverine stream feature mapped on the National Wetland Inventory (NWI) map on the south side of the river that terminates at the Columbia River through an off channel inlet of the river. Additionally, there is one Freshwater Emergent Wetland feature shown on the south side of the river, on the southeast of the intersection of Malaga Rd and Malaga-Alcoa Hwy (see Appendix B for the NWI Map). The width of the Columbia River is estimated to range from approximately 1,400-1,450 feet in the vicinity of the crossing.

The conceptual alignment of the Mid-Valley Connection includes seven pier locations that would be placed in the Columbia River. Aquatic resources within the Columbia River have the potential to have direct temporary and permanent impacts within the project footprint due to construction of these pier locations. Additionally, a new bridge location has the potential to result in water quality and hydraulic impacts to the river. There is also one freshwater emergent wetland feature identified on the south side

of the river by the NWI Mapper which has the potential to be impacted by construction of a bridge in this location.

An Aquatic Resource Delineation will be necessary to identify the presence or absence of aquatic resources in the project area, and to delineate their respective boundaries and associated buffers. This delineation will facilitate the development of a combined Shoreline Impact Assessment and Habitat Management Plan which will detail any impacts to aquatic resources and required mitigation measures necessary to maintain or uplift the ecological value of the impacted aquatic resources, riparian areas, and associated buffers.

Cultural Resources

The WISAARD mapping tool's predictive model depicts that the corridor along the Columbia River, including the Mid-Valley Connection bridge site, is listed as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool did not identify any known structures listed or eligible to be listed on the NHRP and the Washington Heritage Register.

During informal coordination, Chelan PUD also indicated that the Mid-Valley Connection bridge site study area on the southern side of the Columbia River has the potential to contain significant historic properties not identified within the publicly accessible WISSARD database.

To identify if cultural resources or historic structures are present within the vicinity of the project and if they will be impacted, a cultural resources survey conducted by a qualified archaeologist and/or architectural historian will be required. If any adverse impacts to any identified cultural resources are unavoidable, proper mitigation measures will need to be identified and implemented as part of the project.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Mid-Valley Connection bridge site. The site is predominantly located in both Douglas County (Census Tract 9503) and Chelan County (Census Tract 9612).

Preliminary Review of this socioeconomic data suggests that construction of a Mid-Valley Connection bridge is not expected to have any significant or disproportionate socioeconomic impacts on impacts to low income or minority groups or the residents of Douglas and Chelan Counties. If acquisition of real property or displacement of persons is required to construct a bridge in this location, the policies set forth in 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, will need to be followed and adhered to during development and implementation of the project.

Soils and Farmland Classification

Soils information and associated farmland classifications for the Mid-Valley Connection bridge site obtained from the NRCS Web Soil Survey indicated that the area contains soils that are considered Farmland of Statewide Importance and Farmland of Unique Importance.

On the north side of the river, areas identified as farmlands are currently developed as residential and roadway land uses and no longer qualify as Farmland of Statewide Importance and Farmland of Unique Importance. No impacts to soils classified as farmland are anticipated on the north side of the river. On the south side of the river, areas are identified as Farmland of Statewide Importance and Farmland of Unique Importance. Some of the areas identified as farmland are currently being used as roadway associated with Malaga-Alcoa Highway and W Malaga Rd, and no longer qualify as farmland. Historical aerial imagery indicates that some of these areas have previously been utilized as agricultural land. Coordination with USDA NRCS will be needed to determine the level of impact to farmlands within the project footprint for agricultural purposes.

Sensitive Lands

The land in the vicinity of the Mid-Valley Connection site is a combination of undeveloped, residential, and agricultural land uses. The Land and Water Conservation Fund mapping tool did not identify any previously federally funded project locations in the vicinity of the conceptual site. The Apple Capital Recreation Loop Trail terminates on the east bank of the Columbia River, within Hydro Park, located approximately 0.37 miles to the west of the conceptual bridge study area. The Hydro Park and the Apple Capital Recreation Loop Trail areas require consideration under Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 U.S.C. § 303) to ensure construction of a Mid-Valley Connection bridge will not adversely affect the activities, features, or attributes of any Section 4(f) resources.

4.3.4.2 NEPA/SEPA and Permitting

Any new or expanded bridge crossing will ultimately require funding and approvals from federal, state, and local government agencies and require compliance and reviews under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). The anticipated level of NEPA review and documentation associated with construction of a Mid-Valley Connection bridge is an Environmental Assessment (EA). However, if any significant adverse impacts to environmental resources are discovered to occur as a result of the project, the level of NEPA review may be elevated to an Environmental Impact Statement (EIS). Pursuant to WAC 197-11-610, Washington State lead agencies may adopt the environmental analysis prepared under NEPA in place of preparing an environmental checklist under SEPA.

Beyond the base need for NEPA and SEPA compliance, construction of a Mid-Valley Connection bridge would require obtaining various permits and associated regulatory clearances with various federal, state, and local government entities. Table 4-5 below lists the various environmental permits and regulatory clearances that are anticipated to be required.

Table 4-5: Anticipated Environmental Permitting and Associated Regulatory Clearances

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act	The discharge of dredged and/or fill material into waters of the US.
WA Department of Ecology (DOE)	Section 401 of the Clean Water Act State Water Pollution Control Act	Discharges into Waters of the US and Waters of the State, including wetlands.

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Coast Guard (USCG)	Section 9 of the Rivers and Harbors Act of 1899 General Bridge Act of 1946	Bridges crossing navigable waters of the US.
USFWS and NOAA Fisheries	Section 7 of the ESA	Effects to ESA listed species.
WA DAHP State Historic Preservation Office	Section 106 of the NHPA	Effects to cultural resources/historic properties.
WA Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval	Work in or near state waters.
Local Government (Chelan County, Douglas County)	Shoreline Management Act Critical Areas Ordinances	Work within 200 feet of the shoreline of a water of the state and/or critical areas.
Chelan County PUD	Rock Island License, Article 412(d)	Crossing of "Project Waters" within the FERC licensed boundaries of Rock Island Dam

4.3.5 Property and Land Use Considerations

A high-level property and land use assessment was conducted for each of the four crossing alignments: Downtown Connection, SR285 Expansion, Mid-Valley Crossing, and Malaga/Rock Island Industrial Area. Each assessment includes the number of parcels potentially impacted, total acreage, land use, and potential cost of parcel acquisition. Chelan and Douglas County assessor's maps were used to review ownerships, land use, and assessed values of private land.

On the Chelan County side of the River, there is no current development being impacted except for one agricultural property. A majority of the property within Chelan County is maintained almost entirely as agricultural lands. On the Douglas County side, this alignment will also restrict roadway access for one residency within proximity to the connection on SR28. A majority of the land associated with the Douglas County side is also unbuilt residential land. Further, the parcel owned by the mobile home park is assumed to not function as a part of the mobile home park under residential leased lots. The Mid-Valley Crossing is not expected to have significant impact to private properties, with the exception of one.

To estimate costs, total square acreage was calculated based on potentially impacted parcels within the alignment footprint. A 1.4 contingency factor and \$120,000 flat fee for permitting and acquisition were applied, providing a conservative planning-level estimate. On the Douglas County side, the estimated acreage needed for the Mid-Valley Crossing is 3.74 acres from seven parcels with an estimated cost of \$865,000. On the Chelan County side, there are four potentially impacted parcels totaling 2.52 acres, that may roughly equate to \$43,000. The total adjusted property costs are about \$1M for the Mid-Valley Crossing.

Table 4-6 displays the estimated costs necessary for the Mid-Valley Crossing.

Table 4-6: Potential Acquisition Costs

Total Number of Parcels Affected	Total Acres Assumed for ROW Acquisition	Total Estimated Cost
Douglas County		
7	3.74	\$865,000*
Malaga/Chelan County		
4	2.52	\$43,000*
Flat Fee Cost:		\$120,000
Adjusted Total Estimated Cost (Rounded)		\$1,030,000

**Contingency factor was applied to total cost*

4.4 Malaga/Rock Island Industrial Area

4.4.1 Transportation/Traffic Considerations

4.4.1.1 Traffic

2050 Traffic Forecasting

The Malaga/Rock Island Industrial Area Crossing is intended to provide better connection for future industrial economic development in Rock Island and Malaga. One crossing location was modeled using the CDTC 2050 model – the Rock Island crossing concept. The proposed bridge concept included one lane in each direction connecting to SR28 on the north side of the river and Malaga Alcoa Highway on the south side of the river.

A “differences” plot, which shows roadway volume differences between a concept and a “no-build” scenario, was generated for the Malaga/Rock Island Industrial Area concept. The 2050 PM peak hour modeled volume differences for the potential Malaga/Rock Island Industrial Area Crossing are illustrated in Figure 4-4.

The proposed Malaga/Rock Island Industrial Area Crossing bridge attracted approximately 500 vehicles during the PM peak hour, or about 5,000 daily vehicles, while reducing traffic on the existing SR285/Sellar Bridge by approximately 300 vehicles during the PM peak hour. Overall, the Malaga/Rock Island Industrial Area Crossing concept may increase the total number of river crossings by approximately 220 PM peak hour trips, or about 2,200 daily trips.

The reduction in traffic on the existing SR285/Sellar Bridge results in about a 4% reduction of future traffic. The 4% traffic reduction on the existing SR285/Sellar Bridge does improve the operations of the existing bridge, in comparison to the No-Build, or Baseline, condition. However, the Malaga/Rock Island Industrial Area Crossing modeling shows the existing SR285/Sellar Bridge v/c ratio is still over a 1.0. In addition, the proposed Malaga/Rock Island Industrial Area Crossing slightly reduces traffic on SR28 from the proposed bridge location to the SR285/Sellar Bridge.



Figure 4-4: 2050 PM Peak Hour Volumes – Malaga/Rock Island Industrial Area

Traffic and Transportation Enhancements

The Malaga/Rock Island Industrial Area Crossing requires a roundabout to connect to SR28. Minor roadway widening approaching the intersection along with signing, striping, and lighting modifications on SR28 would be needed to support this change in traffic control.

A roundabout or traffic signal is also proposed on the south side of the river to connect to Malaga Highway. This improvement is needed to help facilitate traffic and minimize the delays expected from traffic utilizing the proposed crossing. Minor roadway widening approaching the intersection along with new signing, striping, and lighting would be needed on Malaga Alcoa Highway.

Further to the west of the Malaga/Rock Island Industrial Area Crossing, at the intersections of Malaga Alcoa Highway with West Malaga Road and with Stemilt Creek Road, it is anticipated that left-turn lanes will be needed as the traffic along Malaga Alcoa Highway is expected to increase, primarily in the westbound direction of travel. These left-turn lanes would aid in the safety of the roadway with any increase in traffic from the proposed Malaga/Rock Island Industrial Area Crossing concept.

4.4.1.2 Freight

The Malaga/Rock Island Industrial Area Crossing is intended to provide a more direct connection to Malaga to support industrial development, however it is not expected to impact regional freight using SR28 or SR285.

4.4.1.3 Transit

There is no existing transit service on either side of the river at the concept location. Potential future development could lead to a new demand for transit service with a bridge providing flexible options for a route that serves both sides of the river.

4.4.1.4 Active Transportation

The Rock Island loop trail extension may follow the SR28 corridor to this location. Further planning and concept development of the loop trail extension is ongoing and should factor into the active transportation facilities at this location should the bridge continue into further design. The concept proposed shows a separated bike and pedestrian lane on one side of the bridge.

4.4.2 Structural Considerations

4.4.2.1 Bridge

At this crossing location, there are multiple constraints and factors that influence the roadway/bridge profile, pier locations, overall layout, and construction costs. These include:

- **BNSF Tracks:** Along the northern bank of the Columbia, BNSF currently operates a mainline track that will need to be crossed by the bridge structure. The minimum vertical clearance over their right-of-way is 23.5-feet as measured from the top of the highest rail to the lowest part of structure. This results in the roadway profile needing to stay high over the track prior to descending to the connection at State Route 28. Similarly, there is a spur line that will need to be crossed with a bridge structure. This spur line appears to feed the facilities at the Alcoa Wenatchee Works. It may be possible that rail volumes are low enough for this spur that an at-grade rail crossing may be feasible.
- **Topography at River Crossing:** The topography of the riverbanks in this location are going to significantly impact the overall layout and costs of the structure. The grades are steep which will result in pier heights as high as 100-feet above existing ground (not including portions below the waterline). It may be necessary to modify the roadway alignment to better traverse these grades such that pier heights remain more manageable.
- **Construction Considerations:** Construction at this location will occur primarily in undeveloped areas. Challenging grades notwithstanding, this will provide easier access and laydown areas for the Contractor to stage equipment and materials. This will keep temporary and permanent impacts smaller than in other alternatives that are in more developed areas.

4.4.2.2 Walls

Given the topography and the vertical clearance constraints mentioned previously, most walls for this crossing are likely to be fill-type walls. These are typically constructed using Mechanically Stabilized

Earth or CIP concrete retaining walls. If geotechnical conditions are poor, ground improvements and/or deep foundations for these walls may be required. Some cut walls may be required, particularly on the northern bank, and are likely to consist of soldier pile and/or soil nail retaining walls.

4.4.3 Capital and Life-Cycle Costs

4.4.3.1 Capital Cost Summary

Planning level cost estimates were developed for each representative crossing location. Costs were based on high-level estimates for the infrastructure, design, permitting and additional right of way costs. Estimates cover the bridge structure and connecting roadways, trails, utility modifications and intersection improvements anticipated adjacent to the bridge crossing. Also included are estimates for intersection improvements that would be needed elsewhere in the corridor to improve functionality at the bridge. Due to the conceptual level understanding of the project, a 30% contingency is added to the base estimate. Cost estimates are shown in today's dollars, which for this study is first quarter 2024. The table below shows a breakdown of the major cost categories. The total costs are shown as a range starting as 20% lower than the base estimate to 40% higher. These cost estimates have been developed based on the representative crossing concept shown. Future design development may result in a different configuration which may have significant impacts on project cost estimates.

MALAGA/ROCK ISLAND INDUSTRIAL AREA: PLANNING-LEVEL COST BREAKDOWN	
CONSTRUCTION COSTS	\$96,500,000
PROFESSIONAL SERVICES	\$48,300,000
RIGHT OF WAY	\$140,000
TOTAL	\$144,940,000
PLANNING-LEVEL RANGE (80% - 140%)	\$116 - \$203 MILLION

4.4.3.2 Life Cycle Cost Considerations

Life cycle costs will be proportionate to the amount of proposed infrastructure for each alternative. These costs will be further increased based on proportion of bridge structure and retaining walls relative to the total project footprint. The design life for both steel and concrete bridge structures per AASHTO is 75 years. In general, concrete structures require less routine/preventative maintenance when compare to steel which typically requires repainting every 25-30 years. In arid environments like this one, consideration can be given to using weathering steel in lieu of painted steel. This type of steel forms a protective patina, over time which does not require regular maintenance.

For the purposes of this alternatives analysis, concrete bridges are assumed as they typically offer better long-term performance and lower life-cycle costs for the span lengths and superstructure types considered. Future phases of design should give consideration to using steel as the primary bridge material, particularly if span lengths need to increase based on environmental, navigational and other project constraints. Additionally, consideration should be given to adopting longer design life cycle

criteria (e.g. 100 years or more) for portions of the structures that may be cost prohibitive to repair or replace (i.e. the main spans of the river crossing).

4.4.4 Environmental Considerations

4.4.4.1 Environmental Resources

Sensitive Species and Habitats

Endangered Species Act Listed Species and Essential Fish Habitat

The USFWS IPaC species list (2023) and the NOAA Fisheries Protected Resources App (2023) collectively identified 7 ESA-listed species with the potential to occur within the vicinity of the conceptual Malaga/Rock Island Industrial Area bridge location. Additionally, the entire Upper Columbia River watershed is identified Essential Fish Habitat for Chinook and Coho Salmon.

The representative alignment of the Malaga/Rock Island Industrial Area bridge includes five support pier locations that would be placed within the Columbia River. These pier locations and the overwater structure of the bridge have the potential to result in impacts to ESA listed fish species and their Critical Habitat, including Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead. To properly access the impacts related to bridge construction and its continued existence and operation to ESA listed species, a biological assessment would need to be developed to facilitate Section 7 Consultation under the ESA. Additionally, the biological assessment would need to address any impacts to Essential Fish Habitat to facilitate the identification of applicable conservation measures.

WDFW Priority Habitats and Species

The WDFW PHS list (2023) and State Wildlife Action Plan identify 25 sensitive species and 3 habitats (biodiversity corridor, cliffs/bluffs, and shrubsteppe) that have potential to occur within the vicinity of the conceptual Malaga/Rock Island Industrial Area crossing.

Due to the minimally developed land in the vicinity of the conceptual Malaga/Rock Island Industrial Area bridge site, which includes infrastructure associated with the existing and non-operational Silicon Smelter, suitable habitat for the identified species/habitats has the potential to occur in the vicinity of the conceptual bridge crossing. The current conceptual alignment of the Malaga/Rock Island Industrial Area bridge would intersect with potential Cliffs/Bluffs habitat that is noted on the WDFW PHS report and would require further investigation.

The WDFW PHS report also identifies a Biodiversity Area and Corridor within the vicinity of the conceptual Malaga/Rock Island Industrial Area bridge crossing. This habitat is specified as terrestrial habitat and is located on the south side of the river. The areas on the south side of the river, within the vicinity of the conceptual bridge crossing, are generally undeveloped. As such, design consideration should be implemented to ensure that habitat fragmentation is avoided and minimized to the greatest extent practicable.

To assess any potential impacts, species and habitat surveys will be needed to identify the presence or absence of any WDFW listed species and habitats within the vicinity of the bridge location. A Habitat Management Plan will likely need to be prepared utilizing data gathered during onsite species and habitat surveys to identify and address any potential impacts to species and habitats, and to define

any mitigation measures that may be required based on the level of impacts resulting from the bridge construction.

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act Species

The USFWS IPaC species list (2023) identified 9 bird species protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act with the potential to occur within the vicinity of the Malaga/Rock Island Industrial Area bridge location.

Due to the undeveloped nature of the project vicinity and the potential presence of suitable habitat associated with the Cliffs/Bluffs habitat, it is possible that the bird species identified have the potential to occur within the vicinity of the project. This is amplified by the fact that the bridge location is in the vicinity of the Pacific Flyway. A survey by a qualified professional will be required to confirm or deny the presence of any migratory birds in the vicinity of the project footprint. Additionally, avoiding construction activities within the breeding season (April 1-August 31 for most species) will further reduce any potential conflicts or impacts to these species.

Aquatic Resources

There are two features mapped on the National Wetland Inventory (NWI) map in the vicinity of the Malaga/Rock Island Industrial Area crossing location, the Columbia River and one freshwater pond feature (see Appendix B for the NWI Map). The width of the Columbia River is estimated to range from approximately 1,050 feet to 1,150 feet within the study area.

The conceptual alignment of the Malaga/Rock Island Industrial Area bridge includes five support pier locations that would be placed within the Columbia River. Aquatic resources within the Columbia River have the potential to have direct temporary and permanent impacts within the project footprint due to construction of these pier locations. Additionally, a new bridge location has the potential to result in water quality and hydraulic impacts to the river. The freshwater pond feature identified in the north side of the river by the NWI Mapper is in the near vicinity of the conceptual alignment and will require further investigation to determine whether it is present and will be impacted.

An Aquatic Resource Delineation will be necessary to identify the presence or absence of aquatic resources in the project area, and to delineate their respective boundaries and associated buffers. This delineation will facilitate the development of a combined Shoreline Impact Assessment and Habitat Management Plan which will detail any impacts to aquatic resources and required mitigation measures necessary to maintain or uplift the ecological value of the impacted aquatic resources, riparian areas, and associated buffers.

Cultural Resources

The WISAARD mapping tool lists the Malaga/Rock Island Industrial Area bridge site as the highest level of concern for the potential for cultural resources to be present. The WISAARD mapping tool highly advises that cultural resources studies be performed for the site to identify any cultural resources that may be present. The WISAARD mapping tool also identifies that the Rock Island Railroad Bridge is listed on the NHRP and the Washington Heritage Register.

During informal coordination, the Tribal Historic Preservation Officer of the Colville Tribe also indicated that the Malaga area has the potential to contain significant historic properties not identified within the publicly accessible WISSARD database.

Being that the conceptual Malaga/Rock Island Industrial Area bridge would be located near the existing Rock Island Railroad Bridge which is listed on each of the NRHP and the Washington Heritage Register, mitigation for impacts related viewshed of the historic structure are anticipated as a result of the project. To identify if any other cultural resources or historic structures are present within the vicinity of the project and if they will be impacted, a cultural resources survey conducted by a qualified archaeologist and/or architectural historian will be required. If any adverse impacts to any identified cultural resources are unavoidable, proper mitigation measures will need to be identified and implemented as part of the project.

Socioeconomic

The United States Census Bureau (2023) and EPA's Environmental Justice Screening Tool (2023) were used to obtain the socioeconomic profiles of the communities in and around the Malaga/Rock Island Industrial Area crossing site. The site is predominantly located in both Douglas County (Census Tract 9503) and Chelan County (Census Tract 9612).

Preliminary review of this socioeconomic data suggests that construction of a Malaga/Rock Island Industrial Area bridge is not expected to have any significant or disproportionate socioeconomic impacts on the residents of Douglas and Chelan Counties. If acquisition of real property or displacement of persons are required to construct a bridge in this location, the policies set forth in 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, will need to be followed and adhered to during development and implementation of the project.

Soils and Farmland Classification

The NRCS Web Soil Survey notes that the Malaga location contains soils that are considered Prime Farmland if Irrigated, Farmland or Statewide Importance, and Farmland of Unique Importance. On each side of the river, locations where Prime Farmland is identified are currently being utilized for residential and roadway uses and no longer qualify as Prime Farmland if irrigated. On the south side of the river, some Farmland of Unique Importance is currently undeveloped land. There are currently agricultural land uses in the vicinity of the conceptual crossing. Coordination with USDA/NRCS will be needed to determine the level of impacts to farmlands within the project footprint.

Sensitive Lands

Most of the land in the vicinity of the Malaga/Rock Island Industrial Area bridge site is undeveloped with the exception of the Rock Island Smelter and associated infrastructure and facilities. The Land and Water Conservation Fund mapping tool (2023) was utilized to identify any previously federally funded project locations in the vicinity of the conceptual site. No previously federally funded projects were located in the vicinity of the conceptual site. The conceptual alignment of the Malaga bridge location does not contain any identified sensitive lands or recreation facilities. No impacts to sensitive lands are anticipated at the Malaga/Rock Island Industrial Area location.

4.4.4.2 NEPA/SEPA and Permitting

Any new or expanded bridge crossing will ultimately require funding and approvals from federal, state, and local government agencies and require compliance and reviews under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). The anticipated level of NEPA review and documentation associated with construction of a Malaga/Rock Island Industrial Area

bridge is an Environmental Assessment (EA). However, if any significant adverse impacts to environmental resources are discovered to occur as a result of the project, the level of NEPA review may be elevated to an Environmental Impact Statement (EIS). Pursuant to WAC 197-11-610, Washington State lead agencies may adopt the environmental analysis prepared under NEPA in place of preparing an environmental checklist under SEPA.

Beyond the base need for NEPA and SEPA compliance, construction of a Malaga Industrial bridge would require obtaining various permits and associated regulatory clearances with various federal, state, and local government entities. Table 4-7 below lists the various environmental permits and regulatory clearances that are anticipated to be required.

Table 4-7: Anticipated Environmental Permitting and Associated Regulatory Clearances

Regulatory Agency	Implementing Regulations	Trigger for Permit/Compliance Need
US Army Corps of Engineers (USACE)	Section 404 of the Clean Water Act	The discharge of dredged and/or fill material into waters of the US.
WA Department of Ecology (DOE)	Section 401 of the Clean Water Act State Water Pollution Control Act	Discharges into Waters of the US and Waters of the State, including wetlands.
US Coast Guard (USCG)	Section 9 of the Rivers and Harbors Act of 1899 General Bridge Act of 1946	Bridges crossing navigable waters of the US.
USFWS and NOAA Fisheries	Section 7 of the ESA	Effects to ESA listed species.
WA DAHP State Historic Preservation Office	Section 106 of the NHPA	Effects to cultural resources/historic properties.
WA Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval	Work in or near state waters.
Local Government (City of Rock Island/Chelan County)	Shoreline Management Act Critical Areas Ordinances	Work within 200 feet of the shoreline of a water of the state and/or critical areas.
Chelan County PUD	Rock Island License, Article 412(d)	Crossing of "Project Waters" within the FERC licensed boundaries of Rock Island Dam

4.4.5 Property and Land Use Considerations

A high-level property and land use assessment was conducted for each of the four crossing alignments: Downtown Connection, SR285 Expansion, Mid Valley Crossing, and Malaga/Rock Island Industrial Area. Each assessment includes the number of parcels potentially impacted, total acreage, land use, and potential cost of parcel acquisition. Chelan and Douglas County assessor's maps were used to review ownerships, land use, and assessed values of private land.

Most of the land uses within the Malaga/Rock Island Industrial Area are either nonoperating industrial land or agricultural resource lands. On the Chelan County side of the river, the alignment runs through property entirely owned by Alcoa Wenatchee LLC that previously operated as an aluminum smelter. The property belonging to Alcoa Wenatchee LLC has not been in operation since 2015. The current alignment does not require full acquisition of any parcels but will divide this property. The property owned by Columbia

Ventures holds the former American Silicon Technologies plant, with the potential alignment running through several remaining fume pods of the site. Similarly, land on the Rock Island side of the river is also unbuilt and is largely encompassed by the Rock Island Industrial Redevelopment District. On the Rock Island side, the property also remains largely unused industrial spaces, with one operating mining business. Only partial acquisitions will be necessary for both sides of the river.

To estimate costs, total square acreage was calculated based on potentially impacted parcels within the alignment footprint. A 1.4 contingency factor and \$75,000 flat fee for permitting and acquisition were applied, providing a conservative planning-level estimate. On the Douglas County side, the estimated acreage needed for the Malaga/Rock Island Industrial Area is 4.4 acres from four parcels with an estimated cost of \$50,000. On the City of Wenatchee side, there are four potentially impacted parcels totaling about 5 acres, that may roughly equate to \$12,000. The total adjusted property costs are about \$137,000 for the Malaga/Rock Island Industrial Area.

Table 4-8 displays the costs of property necessary for the Malaga/Rock Island Industrial Area.

Table 4-8: Potential Acquisition Costs

Total Number of Parcels Affected	Total Acres Assumed for ROW Acquisition	Total Estimated Cost
Rock Island/Douglas County		
4	4.40	\$50,000*
Malaga / Chelan County		
4	5.042	\$12,000*
Flat Fee Cost:		\$75,000
Adjusted Total Estimated Cost (Rounded)		\$137,000

**Contingency factor was applied to estimated cost*

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