

2023 Transportation Impacts of Lower Snake River Dam Removal

Jacobs Statement of Qualifications for
WSDOT

October 24, 2023



1. GENERAL QUALIFICATIONS / EXPERTISE OF FIRMS ON TEAM

A. EXPERTISE

To address the unique needs of the Transportation Impacts of Lower Snake River Dam Removal study, WSDOT needs a team that understands how your entire network operates—past, present, and future—as well as the risks and opportunities posed by the dam removal concept. **Jacobs assembled a world-class team with expertise in three areas critical to project success:**

- 1. Infrastructure and engineering.** We are of Washington State—from Seattle to Spokane—and we’re proud of having contributed to WSDOT’s progress over the last 50 years. *Since 1947, Jacobs helped develop and maintain some of the region’s most challenging and necessary public infrastructure and programs*, including work on many of WSDOT’s state and federal highways, Class 1 railroads, hydroelectric dams, and maritime ports. This means we can provide reliable cost information in helping WSDOT understand the true cost of replacing the transportation functions currently provided by the Snake River.
- 2. Policy and regulations.** Removing Lower Snake River Dams has been debated for nearly two decades. The issue involves complicated policies, regulations and tribal treaties. We work in this regulatory landscape daily from completing WSDOT fish passage projects, to FERC relicensing, to piping irrigation water for Kittitas County Conservation District. We will leverage our existing regulatory, Class 1 Rail, tribal, and agency relationships as well as institutional knowledge of inland Columbia River waterways and dam removal engineering expertise. This knowledge will help us provide reliable study results that fit within this complex landscape.

- 3. Reliable data.** Our team includes CPCS, who led the development of WSDOT’s State Freight System Plan (SFSP), which included a thorough review of the Columbia River Systems Operations EIS. This prior work will give our team a head start in accessing and using existing data. Additionally, Jacobs brings powerful data modeling and analytic tools that help us predict future transportation impacts and graphically convey information to stakeholders. Our team includes the use of StreetLight Data, which uses Big Data analytics to shed light on how people, goods, and services move, empowering smarter, data-driven transportation decisions.

We summarized our team’s combined expertise in the table below.

	Jacobs	Concord	Select Power	Greene CPCS	Greene Economics	TRABUS	PRR
Years of Experience	75	11	6	10	25	0	42
# of staff in WA (incl. GPMA)	1,450	35	5	2	5	0	80
# of employees nationwide	32,135	40	51	24	5	35	102
Existing data collection research/reporting	✓	✓	✓	✓	✓	✓	
Concept engineering	✓	✓	✓		N/A		
Roadway improvements	✓	✓					
Rail improvements	✓	✓		✓			
Utilities improvements	✓	✓	✓				
HEAL Act	✓			✓			
Geotechnical analysis	✓						
Regulatory environment	✓			✓			
Transportation safety	✓	✓	✓	✓	✓		
Commodity impacts analysis	✓			✓	✓	✓	
Community engagement	✓		✓	✓	✓	✓	✓
Cost estimating	✓	✓	✓	✓	✓	✓	

We assembled a best-fit team that serves both the scope of this transportation impacts study and the long-term objectives WSDOT envisions for the Lower Snake River Dam Removal.

Leadership with perspective. Project Manager, **Seth Torma**, specialized in leading complex regional transportation impact studies, that collaboratively engage stakeholders and clearly communicate information to executive decision makers. He is partnered with **Deputy Project Manager, Jamey Dempster**, who leads Jacobs' Northwest Planning Practice and brings an understanding of local plans and policies.

Professionals embedded in WSDOT culture. We understand the importance of leveraging staff who know understand WSDOT. We have thoughtfully woven in staff who bring WSDOT experience throughout our organization. For example, **Highway Concepts Lead, Patrick Cooper**, who has dedicated his career to delivering projects across WSDOT's Eastern, Northwest, and Southwest regions. **Traffic Analysis Lead, Tung Le**, has over 30 years' experience delivering WSDOT and local agency multimodal transportation impact studies. Jacobs has also partnered with CPCS who led the development of SFSP. Their work was highly regarded for its innovative use of data and clear messaging. As part of CPSC's work they conducted a thorough review of the Columbia River System Operations EIS to understand and present the findings of that study in a way that enabled Washington State's decision-makers to better understand the report's findings.

Staff with Inland Columbia River Waterways freight movement expertise. Our team includes **Scott Drumm**, who was the Director of Research and Strategy for the Port of Portland for 17 years before joining CPCS in 2020. It was literally Scott's job to know the upstream market for all modes that move barge-eligible commodities on the Columbia-Snake. Scott is complimented by **Eric Oberhart**, an expert on the Great Lakes and Ohio River who has led numerous market studies covering all moves on the inland

systems of the United States. Eric was the day-to-day manager for the WSDOT SFSP.

Dam removal expertise. **Larry Moran** brings over 40 years of construction experience in the Pacific Northwest, including roles as project superintendent on the Condit Dam Decommissioning on the White Salmon River in Washington and ongoing work as for PacifiCorp removal of the four Klamath River dams. Experience from these as well as other hydroelectric facilities' building construction, Larry understands large, multi-year projects and the associated impacts they can cause to local and regional transportation resources.

Economics and commodities. The Jacobs team has access to data from CPCS, StreetLight, and TRABUS allowing us to efficiently build on past studies. CPCS has at their fingertips a multimodal commodity flow database, visualizations, and an updated Ports and Waterways Database containing port terminals on the Columbia and Snake Rivers, and ocean coasts. Building on this basis, we will provide data visualizations to help stakeholders easily understand complex economic and commodity flow information. We will leverage this data to evaluate competitiveness impacts associated with modal shift from water to rail and truck along with impacts those modal shifts would have on the supply chain.

Community engagement. At Jacobs, we believe individuals and communities affected by a project, must have a voice in how a project may affect their lives and livelihoods. We bring experience working with local governments in Central and Eastern Washington, agricultural organizations, freight and shipping businesses, Class1 Railroads, Tribes, and Federal regulatory agencies. Our communications team, led by **Elizabeth Guevara**, has spent more than a decade developing unique ways to contact and communicate with these stakeholders.

Organizational Chart

The full structure of our team and our available resources are shown in Figure 1.1: Organizational Chart, below.



LEGEND |  Key Personnel ¹ Concord Engineering (DBE/WBE) ² CPCS ³ Greene Economics (DBE/WBE) ⁴ PRR (DBE/WBE) ⁵ Select Power Systems (DBE/WBE) ⁶ Trabus Technologies

* StreetLight is wholly-owned subsidiary of Jacobs

B. STAFF OFFICES AND LOCATIONS

Staff Offices and Locations

Jacobs

The best-fit team comprising experts in their fields from across the country

- Full-service solutions provider
- 400+ offices in over 40 countries
- 32,000 US-based professionals
- Pacific Northwest service offerings:
 - » Multidisciplinary engineering: roadway, rail, ports and marine, geotechnical, utilities, multimodal, dams, and more
 - » Traffic planning and modeling
 - » Environmental permitting and regulation
 - » Public engagement
 - » Cost estimating
 - » Digital tools
 - » Class 1 Rail regulation
 - » Economics and commodities

OFFICE AND STAFF #
Seattle, WA - 87
Bellevue, WA - 504
Yakima, WA - 39
Spokane, WA - 61
Portland, OR - 708
Vancouver, WA - 40
Tacoma, WA - 11

Concord Engineering

Jacobs has partnered with Concord for years, delivering dozens of the region's most critical transportation studies and infrastructure projects

- OMWBE-registered DBE/MWBE
- **Expertise:**
 - » Traffic analysis and design
 - » Traffic operations analysis
 - » Traffic control plan
 - » Multi-modal corridor studies
 - » Intelligent transportation systems
 - » Lighting analysis and design
 - » Electrical design

OFFICE AND STAFF #
Bellevue, WA - 35

Greene Economics

Quantifying economic impacts of navigation, advising on public infrastructure investment, conducting commodity shipping analyses, and forecasting

- OMWBE-registered DBE/WBE
- **Expertise:**
 - » Economic analysis to evaluate how a project will strengthen local/regional economies
 - » Measuring economic impact on municipal/state agencies, private industry, and national groups

OFFICE AND STAFF #
Ridgefield, WA - 1
Battleground, WA - 1
Mill Creek, WA - 1
Lynnwood, WA - 1

Select Power Systems

Specialized expertise in utilities traversing navigable waterways—both over and under

- OMWBE-registered DBE/WBE
- **Expertise:**
 - » High voltage transmission/distribution engineering, design, protection, relocation
 - » Power-related geospatial and asset management
 - » GIS, cartography, LIDAR, remote sensing

OFFICE AND STAFF #
Spokane, WA - 3
Tacoma, WA - 2

CPCS

Strategic freight transportation policy and planning expertise integrating Class 1 Rail and port operations

- **Expertise:**
 - » Transportation sector economic analysis and policy expert
 - » Financial feasibility analysis and modelling
 - » Cost/benefit and impacts
 - » Infrastructure investment policy and planning

OFFICE AND STAFF #
Seattle, WA - 1
Portland, OR - 1

PRR

Connecting communities, businesses, and residents to the projects that shape the world around them

- OMWBE-registered DBE/WBE
- **Expertise:**
 - » Integrated communication solutions that inform decisions and build stronger, more inclusive communities
 - » Engagement planning
 - » Informational assets and materials
 - » Outreach, public involvement, and virtual engagement

OFFICE AND STAFF #
Seattle, WA - 77
Wenatchee, WA - 1

TRABUS Technologies

AI-based predictive decision support tools that improve waterway safety and efficiency

- California-registered MBE/SBE/DVBE
- **Expertise:**
 - » Predictive analytics to track movement of goods by barge
 - » Tonnage and barge volume statistics to plan for preventive maintenance at locks and dams
 - » AI-based predictive decision support tools

OFFICE AND STAFF #
n/a

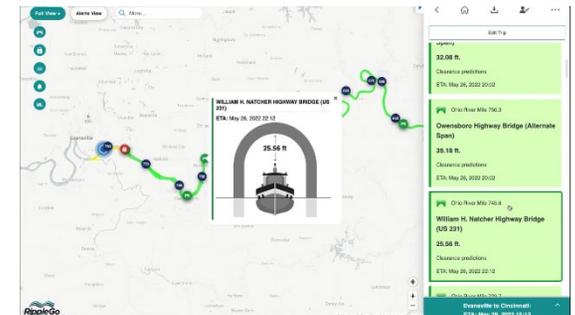
C. PREVIOUS WORK HISTORY

The Jacobs' team provides firms who have often worked together. These working relationships have yielded efficiencies that only come from collaboration and trusted partnerships. In the table below we demonstrate our effective collaboration on projects similar in size and scope and performed in the last three years.

Teaming Partners	Similar Projects Performed with Jacobs in the Last Three Years	Dates
Concord	SR 167/I-5 TO SR 509 Design-Build, WSDOT Jacobs: lead designer; engineering SUB: Traffic analysis; illumination, signal, electrical design; MOT and traffic control plans	2022-Present
CPCS	Arizona Statewide Truck Parking Plan, Arizona Department of Transportation Jacobs: prime; lead project management SUB: truck parking needs and issues data analysis, including inventory update, demand analysis and support identification of parking solutions	2023
Greene Economics	Business District Wastewater Treatment Study, Fall City Jacobs: prime; lead project management SUB: governance structure for community sewer system, cost analysis	2021-2022
PRR	South Central Region GEC, WSDOT Jacobs: prime; lead project management SUB: communications and community engagement	2017-Present
Select Power Systems	SR 167/I-5 TO SR 509 Design-Build, WSDOT Jacobs: lead designer; engineering SUB: transmission and distribution – overhead	2022

Forging new partnerships: Meet TRABUS Technologies

We are excited to partner for the first time with TRABUS Technologies and bring their powerful AI and predictive forecasting software and marine transportation expertise to WSDOT for this impacts study. Their patented software, *RippleGo*, is the first AI-based voyage planning solution for the maritime transportation industry that provides travel time predictions, bridge clearance calculations, forecasted river level conditions, navigation hazards and lock status changes using data analytics and AI. Their work on locks and river transportation such as Lock Status Analysis Tool (LSAT) are highly relevant to this study. The TRABUS team of talented data scientists and inland waterway experts will help define and shape the metrics used in our team's interim and final reporting.



Snapshot of TRABUS' *RippleGo* dashboard.

D. CURRENT AVAILABILITY OF KEY STAFF

The table on the next page illustrates preliminary hours of monthly availability for the first two years of the contract. Our project Manager, Seth Torma, who understands the capabilities and capacities of the firms on our team, will monitor workloads so the right resources are available when WSDOT needs them.

NOTE: Numbers in table represent hours per month in each quarter

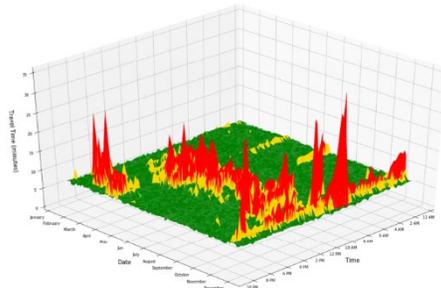
Team Member	2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Management												
Seth Torma, AICP Project Manager	80	80	120	120	120	120	120	120	120	120	120	120
Jamey Dempster, AICP Deputy Project Manager	120	120	120	120	120	120	120	120	120	120	120	120
Transportation Planning and Traffic Engineering												
Tung Le Traffic and Transportation	72	72	72	72	72	80	80	80	80	80	80	80
Ryan White, AICP Traffic and Transportation	30	30	30	30	30	30	30	30	30	30	30	30
Zach Wieban Traffic and Transportation	64	64	64	64	64	64	64	64	64	64	64	64
Neha Rathi Traffic Demand Modeling	96	96	96	96	96	64	64	64	64	64	64	64
Engineering												
Jason Ruth, PE, SE, PMP Rail Concepts	40	40	40	40	40	40	40	40	40	40	40	40
Patrick Cooper, PE Highway Concepts	80	80	80	80	80	80	80	80	80	80	80	80
Jeff Shoemaker, PE Utilities	80	80	80	80	80	80	80	80	80	80	80	80
Goods Movement and Economics												
Dan Seedah, PhD, PE Freight Planning and Analysis	30	30	40	40	40	40	30	30	30	30	30	30
Scott Drumm Freight Planning and Analysis	20	20	20	24	24	24	24	24	24	24	24	24
David Sathiaraj, PhD Inland Waterway Analysis	20	20	20	20	20	20	20	20	20	20	20	20
Donald Ludlow, AICP Economics	30	30	30	40	40	40	40	40	40	40	40	40
Erika Witzke Commodity Flow Analysis	20	20	20	20	24	24	24	24	24	24	24	24
Public Engagement												
Elizabeth Guevara Engagement and Communication	80	80	80	80	80	80	80	80	80	80	80	80
Laura Labissoniere Miller Engagement and Communication	50	50	50	50	50	50	50	50	50	50	50	50

2. SPECIFIC QUALIFICATIONS/EXPERTISE OF FIRMS ON TEAM

A. TRANSPORTATION, ENGINEERING & FREIGHT MOVEMENT

Transportation Studies

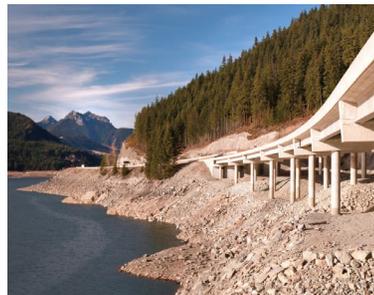
Jacobs will provide technical expertise and an innovative vision for bringing transportation analysis into the solution development and community engagement process. Jacobs and our partners at Concord and CPCS have completed hundreds of highly complex projects delivered for state and local agencies. Streetlight data brings a robust analytics platform to enhance insights into travel demand and traffic movements. Combined, the Jacobs team brings a strong history of delivering accurate and innovative traffic studies, large highway design and rail design concepts in Washington.



*Colorado DOT I-270
Travel Time Reliability.*

General Engineering

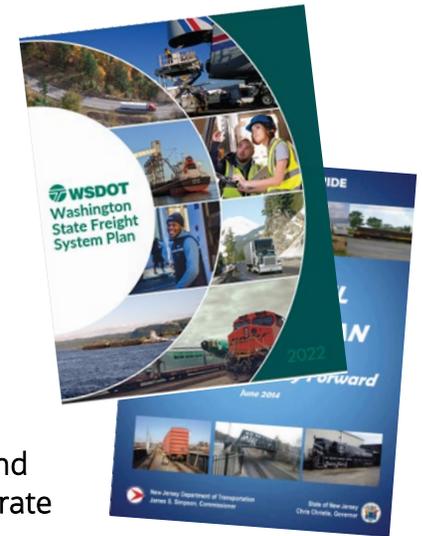
Jacobs is a global solutions provider and one of the region's largest engineering firms, offering a full range of professional civil engineering design services—from concept design and preliminary analysis through final design PS&E and construction support. With offices located from Seattle to Spokane, we have hundreds of engineering staff spanning the full suite of infrastructure engineering needed accomplish tasks identified in this study. Our deep bench means quick access to staff, a single point of accountability, and reliable concepts and costs.



*I-90 Snoqualmie Pass East
Avalanche Bridges*

Freight/Goods Movement

The Jacobs team understands the importance of stakeholder engagement, goods movement planning for all modes, economic analysis, geospatial analytics, and data visualization, fortified by a strong quality control and quality assurance program. Jacobs' partners CPCS, TRABUS, and Greene Economics ensure WSDOT has access to customized multimodal freight transportation and commodity flow analysis to for accurate and far-reaching insights.



Dam Removal

Our recent dam removal projects include Hogansburg Dam on the St. Regis River (New York), two along the Chattahoochee River (Georgia/Alabama) for USACE, and analyses, permitting, and design tasks for two active projects: Lake George Diversion Dam Removal on the South Platte River (Colorado) and Pelham Lake Dam Removal Project on the Hutchinson River (New York). These projects are designed to return the river to pre-project conditions by reconnecting physical processes, including conveyance of sediment, connectivity to floodplain, and protection and enhancement of aquatic and riparian habitat.



Hogansburg Dam removal with water management during demolition.

Transportation Studies

(traffic volumes, traffic forecasting, modal splits, capacity analysis, safety analysis, etc)

1 SR 240/AARON DRIVE INTERCHANGE IMPROVEMENT STUDY

Client Name

WSDOT

Link to final report

Not available

Fee received

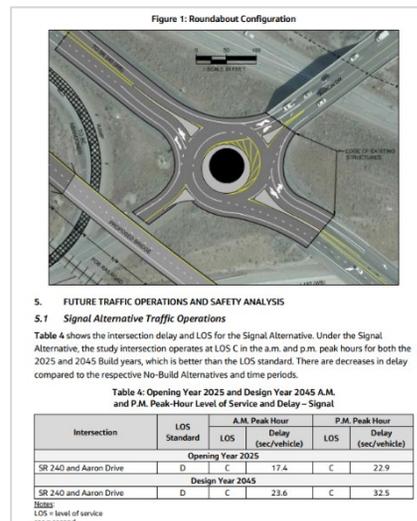
\$26M

Firm

Jacobs

Demonstrated experience

Transportation studies



Page from study depicting roundabout configuration.

Project overview

Jacobs managed and performed the **traffic operations analysis**, **safety impacts assessment**, and non-motorized evaluation of multiple infrastructure improvement options at the SR 240/Aaron Drive interchange. This interchange is vulnerable to congestion and delays during peak commute periods, and conditions are expected to worsen with population and employment growth and redevelopment in central Richland. Improvement options were developed to address congestion and **increase mobility and safety for freight** and commuter traffic. Jacobs conducted the safety analysis of the interchange improvement alternatives using the ISATe analysis software.

Why it matters: The project will increase mobility and **safety** for freight and commuter traffic using the interchange and to improve non-motorized connectivity between the Bypass Shelter Belt and Chamna Natural Preserve trail systems and an unnamed path along the Yakima River.

2 I-5/TACOMA MALL BOULEVARD CORRIDOR ACCESS STUDY

Client Name

WSDOT

Link to final report

Not available

Fee received

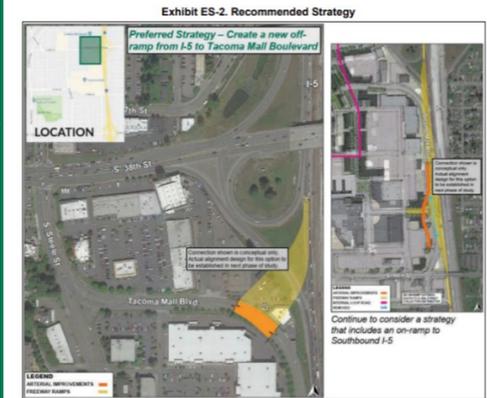
\$460K

Firm

Jacobs

Demonstrated experience

Transportation studies



Page from study summarizing the recommended strategy.

Project overview

Jacobs managed this study to identify strategies and solutions to improve access from I-5 to Tacoma Mall Boulevard using WSDOT's Practical Solution approach. Jacobs developed the problem statement, **forecasted and modeled traffic** demand informed by StreetLight trip pattern information, analyzed anticipated future traffic conditions, and identified solution alternatives for evaluation, screening, ranking and prioritization. The study was closely coordinated with the City of Tacoma, a key partner agency, and the Jacobs team engaged the community through multiple public outreach efforts before preparing planning level **cost estimates** and recommendations for the next phase of implementation.

Why it matters: This feasibility study is the result of coordinated efforts between WSDOT, City of Tacoma, and FHWA for improving access to the Tacoma Mall Neighborhood, which was designated as a Regional Growth Center by the Puget Sound Regional Council (PSRC). This study was completed in compliance with Section 550 of the WSDOT Design Manual.

3 SR 16 TACOMA NARROWS BRIDGE TO SR 3 CONGESTION STUDY

Client Name

WSDOT

Link to final report

[SR 16 Tacoma Narrows Bridge to SR 3 Congestion Study](#)

Fee received

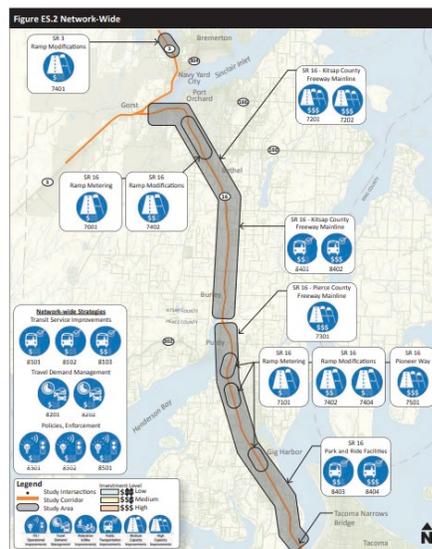
\$2.8M

Firm

Jacobs

Demonstrated experience

Transportation studies



Summary of study's findings for corridor-wide improvements.

Project overview

Jacobs led the study to examine the congestion issues along the West Sound corridors. By implementing a Practical Solutions approach, our team developed solutions and strategies for the short, mid, and long-term improvements along the SR16/SR3 corridors including operational, **capacity**, channelization and signal improvements at key local and state locations. Jacobs worked collaboratively with multiple jurisdictions and stakeholders via a robust public outreach program. Regional travel demand VISSIM model and Synchro operational analysis program were used to **forecast the future traffic** growth as well as the **highway and local traffic impacts**.

Why it matters: The outcome of Practical Solutions planning is a recommended set of multimodal strategies that are cost-effective and balance the goals and objectives of Washington State and its local needs.

4 SR 18 WIDENING: ISSAQUAH-HOBART ROAD TO DEEP CREEK TRANSPORTATION STUDY

Client Name

WSDOT

Link to final report

Not available

Fee received

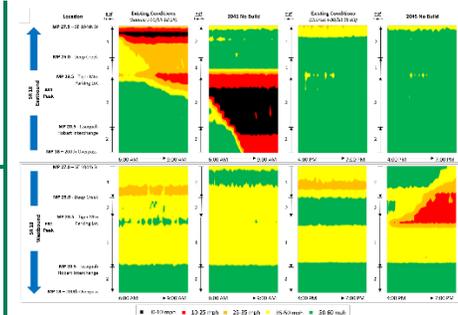
\$230K

Firm

Concord

Demonstrated experience

Transportation studies



Corridor speeds by alternative.

Project overview

Concord led the **traffic operational analysis** to support the **roadway design**. They performed VISSIM microsimulation analysis, Sidra analysis, and **safety analysis** using the predictive crash tool ISATe to **assess traffic operations** along the corridor for the 20-year time horizon. The analysis compared the operations of the preferred corridor configuration with and without truck climbing lanes as well as a practical design exercise comparing the expected change in crashes using a lower design speed. Performance metrics reported include freeway speeds and congestion, corridor travel times, ramp terminal intersection delay and level-of-service, and vehicle throughput.

Why it matters: SR 18 is a **principal freight mobility corridor** and a main route for commerce moving between south King County, Pierce County, and Eastern Washington. Due to increased regional freight traffic and increased recreational activity, SR 18 is expected to play a vital role in serving the region's transportation needs.

General Engineering

(pavement design, road design, bridge, geology, hydrology, cost estimating, etc.)

5 SOUTH CENTRAL REGION (SCR) GENERAL ENGINEERING CONSULTANT (GEC)

Client Name

WSDOT

Link to final report

Not applicable

Fee received

\$63.8M

Firm

Jacobs, PRR

Demonstrated experience

General engineering



Since 2015, Jacobs has been supporting WSDOT's SCR with regional infrastructure improvements projects.

Project overview

Jacobs is currently delivering multidisciplinary engineering, environmental, and design services for WSDOT SCR. Jacobs is currently supporting design (preliminary and final), environmental, hydraulics, bridge, utilities, traffic, planning, community engagement, project management, and construction services under a GEC contract. Over the last 6 years, Jacobs has supported SCR on the completion of several relevant projects requiring close coordination and communication with dozens of stakeholders and WSDOT approvals.

Pavement and road design. Jacobs supplements WSDOT roadway design and technician staff on projects being designed throughout the region such as the US 97 Dolarway Intersection (design of a roundabout at the intersection of US 97 and Dolarway Rd); US 97 Corridor Improvements (design of multiple

intersection improvement projects along the US 97 corridor between Toppenish and Union Gap).

Bridge design. Jacobs is providing bridge, structure, and culvert design staff on projects such as the I-90 Bridge Deck Rehabilitations (design of bridge deck rehabilitations near Cle Elum and Ellensburg) and US 12 Wildcat Creek Bridge Replacement.

Hydrology. Jacobs is currently preparing drainage designs, hydraulic reports, and preliminary hydraulic designs in addition to leading two stormwater retrofits projects.

Cost estimating. At WSDOT's request, Jacobs provides projects controls, value engineering, lifecycle costing and estimation, risk calculation, and biddability review.

Transportation planning. Jacobs supplements WSDOT planning staff with expertise in transit, bicycle, and pedestrian planning; feasibility/alternative analyses studies, corridor and route studies, and master planning for improvements.

Environmental planning. Jacobs provides environmental staff to supplement efforts on environmental analysis and documentation (NEPA/SEPA). A sampling of projects includes I-90 Corridor Improvements biology and permit services, transportation planning, and environmental services on the US-195, Colfax Passing Lane.

Public engagement. Jacobs and PRR provide strategic communications support to WSDOT SCR project engineers and communications staff. They work with WSDOT to develop messaging for each project and then consider how best to deliver that message.

6 SR 167/I-5 TO SR 509 DESIGN-BUILD

Client Name

WSDOT

Link to final report

Not applicable

Fee received

\$31.6M

Firm

Jacobs, Select Power Systems, Concord

Demonstrated experience

General engineering

Why it matters: Jacobs will leverage design experience delivering our state's most critical transportation and freight network improvement projects. Strategic teaming partnerships with subconsultants such as Concord and Select Power Systems contributes to our long-term excellence in project delivery.

Project overview

This project is a crucial part of our state's transportation network to relieve traffic congestion and improve freight mobility. This project is part of the Puget Sound Gateway program, key to enhancing the state's economic competitiveness, both nationally and globally, by connecting the state's largest ports to key distribution centers in King and Pierce counties and to Eastern Washington.

Jacobs: Lead designer, overseeing and providing road, pavement, geotechnical, and bridge design in addition to environmental design, coordination, and regulatory compliance including geology, hydrology, and landscaping.

Concord: Performing permanent traffic signal design, RRFB design, temporary traffic signal design, permanent freeway and local road signing design, and traffic control plans for freeway and local road closure, detour, and rolling slowdown.

Select Power Systems: Provided utilities engineering and design for 115KV transmission and distribution and communications facilities relocation to accommodate a new highway overpass.

Freight Movement

(rail, barge, and truck)

7 2022 WASHINGTON STATE FREIGHT SYSTEM PLAN UPDATE

Client name

WSDOT

Link to final report

https://wsdot.wa.gov/sites/default/files/2022-12/WA-State-Freight-System-Plan-2022_0.pdf

Fee received

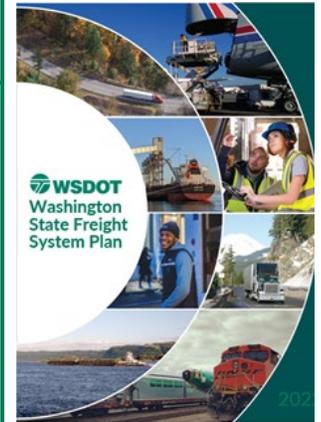
\$1.5M

Firm

CPCS

Demonstrated experience

Economics, markets, and commodities



Project overview

CPCS provided quick-response insight on how the removal of the Snake River Dams would impact the multimodal freight system. At the request of WSDOT's Rail, Freight, and Ports Division, CPCS utilized a tailored multimodal freight database they developed for WSDOT, industry knowledge of logistics modal tradeoffs (e.g., cost, routing, labor, markets, commodities, other factors, and the expertise of our inland waterway team to develop a **mode-shift** snapshot.

Why it matters: CPCS developed a Columbia-Snake River closure **mode-shift** snapshot using Freight Analysis Framework data; developed freight performance measures and assessed the condition and performance of the **multimodal freight** system; identified and ranked **truck freight** bottlenecks; researched the value freight and international trade has in Washington, and how freight transportation supports Washington's industries; and updated statewide inventory of freight assets and corridors.

8 STATEWIDE STRATEGIC FREIGHT PLAN

Client Name

NJDOT

Link to final report

nj.gov/transportation/freight/rail/pdf/NewJerseyStatewideFreightRailStrategicPlanJune2014.pdf

Fee received

\$250K

Firm

Jacobs

Demonstrated experience

Freight movement: truck and rail



Project Overview

Jacobs led a multidisciplinary team in preparation of a statewide strategic plan focusing on maximizing the economic, environmental, and quality of life benefits of a robust **freight rail** system. Building upon extensive coordination and input from a wide cross section of state agencies, **Class 1 Railroads** and shortline/terminal railroads, the goal of the plan was to advance the following freight movement and objectives: integrated planning, economic development, mobility, sustainable investment, community and environment, and **safety/security**.

Why it matters: Recommendations made in the final plan focused on supporting enhancements to the **freight rail** infrastructure, operations, and services that will facilitate efficient and **cost-effective movement of goods to business, industries, and consumers** both within and outside of the state.

9 LOCK STATUS ANALYSIS TOOL AND WATERWAY ACTION PLAN PROJECTS

Client Name

USACE & USCG

Link to final report

Not applicable

Fee received

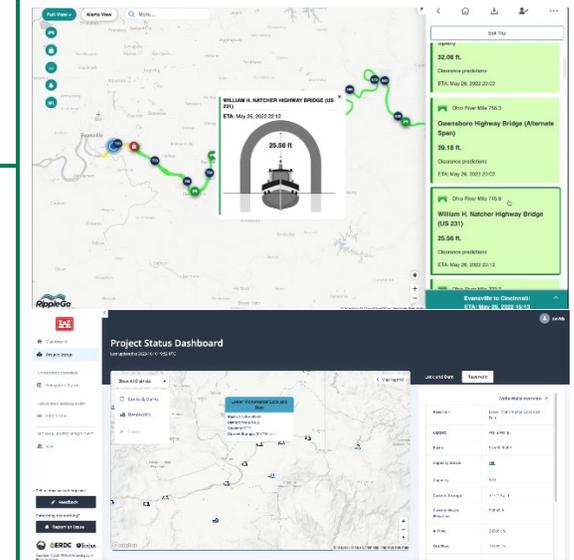
\$4.1M

Firm

TRABUS

Demonstrated experience

Freight movement - barge



Example from TRABUS' predictive modeling tool.

Project Overview

TRABUS is collecting and displaying **barge traffic** statistics for the entire U.S. inland waterways, develop river level predictive models that improve water transportation **safety**, improved situational awareness of waterways, preventive maintenance planner for locks and dams, develop travel time algorithms (ETA) that improve port/terminal logistics.

Why it matters: TRABUS is developing live decision support tool for the USACE and USCG that help plan preventive maintenance tasks at locks and dams/reservoirs to **minimize barge transportation impacts**.

Dam Removal

(transportation infrastructure needed to remove large dams)

10 HOGANSBURG DAM REMOVAL

Client Name

Saint Regis Mohawk Tribe

Link to final report

Not applicable

Fee received

\$382K

Firm

Jacobs

Demonstrated experience

Dam removal



Free flowing conditions for St. Regis River following removal of Hogansburg Dam.

Project overview

Jacobs evaluated alternatives and designed the plan to remove the Hogansburg dam from the St. Regis River, a tributary in northern New York state that drains the headwaters of the Adirondack State Park to the St. Lawrence River. Our team collaborated with the Saint Regis Mohawk Tribe, Trout Unlimited, U.S. Fish and Wildlife, St. Lawrence Environmental Trustee Council, and New York State Department of Environmental Conservation to evaluate—during and after removal—the **hydrology, hydraulics**, sediment transport and impacts to infrastructure, including an upstream bridge owned by the New York State DOT.

Why it matters: Successful completion returned the project land to the Tribe, protected the New York State bridge, and restored access for Atlantic salmon and other aquatic species to 555 miles of stream habitat in the watershed. This project was also the first removal of a hydropower dam in New York State.

Community Engagement

1 SOUTH CENTRAL REGION GEC

Client Name

WSDOT

Year

2015-Present

Fee received

\$63.8M (Jacobs-total GEC)
\$1M (PRR)

Firm

Jacobs (prime), PRR (sub)

Demonstrated experience

Community engagement



Our team is currently conducting community outreach for Vantage bridge construction.

Project overview

Jacobs and PRR provide **strategic communications** support to WSDOT SCR project engineers and communications staff. They collaborated with SCR communications, planning and design staff on—and now help execute—a strategic communications plan that takes into consideration on-going and upcoming projects, stakeholders for those projects and their relationship to the agency, as well as opportunities and risks. They work with WSDOT to **develop overarching messaging for each project and then consider how best to deliver that message** (website, social media, open houses, one-on-one meetings, community briefings, meetings with stakeholders, etc.).

Why it matters: Jacobs and PRR understand how to implement cost effective, sustainable solutions responsive to WSDOT and local stakeholder needs. Our expertise is grounded in tangible, extensive, authentic, and on-going community outreach and relationship building with elected officials, communities, tribal representatives, and government staff at all levels.

2 STATEWIDE PLANNING ON-CALL

Client name

WSDOT

Year

2020-Present

Fee received

\$249K

Firm

PRR

Demonstrated experience

Community engagement



PRR staff meeting with Lummi Transit Drivers for the Human Services Plan.

Project overview

The WSDOT Public Transportation Division is responsible for developing plans that guide transportation improvements across the state. Community engagement is essential for creating collaborative plans that meet the needs of people who rely on public transportation and improve service for Washington communities. PRR led community engagement across the division's statewide planning efforts.

Why it matters: During the first year, PRR helped WSDOT planners engage community partners in reimagining the future of transit and mobility amidst a global pandemic and updating the Human Services Transportation Plan. Planning efforts also supported the Public Transportation Plan update and proviso for unmet transportation needs.

3 WILDFIRES SAFETY TOWN HALL PLANNING, FACILITATION, AND REPORTING

Client Name

Puget Sound Energy (PSE)

Year

2022-2023

Fee received

\$75K

Firm

Jacobs

Demonstrated experience

Community engagement



Town Hall meeting set to present to and engage with a local community.

Project overview

Wildfires are a growing public safety concern for much of the Western United States. Puget Sound Energy (PSE) is taking a comprehensive approach to wildfire mitigation that will help keep customers safe while maintaining the reliable delivery of energy. A series of town halls for communities at higher risk for wildfires were held in 2022, with PSE turning to Jacobs to support planning, facilitation, and eventual summarization of the events. During the town halls, PSE shared current activities to mitigate wildfire risk and what tools are available for potential use in the future. Jacobs drafted a facilitation plan, supported in-person/virtual meeting logistics, reviewed the technical presentation, developed facilitation guides and small group discussion questions, and town hall summary reports.

Why it matters: The outreach events provided an opportunity for PSE customers to share their input and concerns, and to learn more and ask questions about Public Safety Power Shutoffs.

4 STAKEHOLDER ENGAGEMENT FOR WASHINGTON STATE HIGHWAY SYSTEM PLAN

Client name

WSDOT

Year

2021-2023

Fee received

\$190K

Firm

PRR

Demonstrated experience

Community engagement



Washington State Department of Transportation leadership is updating the Highway System Plan, the agency's blueprint for preserving, maintaining, improving and operating state highways in Washington.

Planning for state highways matters—over half of vehicle travel in Washington occurs on state highways. People drive cars and ride mopeds and buses on state highways to reach jobs, schools, and services. Truckers transport goods to market on state highways. People who walk and bike travel along and across state highways, supporting prosperous businesses and healthy communities. WSDOT is committed to providing safe, reliable, and cost-effective transportation options for these travelers.

More than half of traffic in Washington occurs on state highways



Did you know...
...the average travel time to work statewide increased 7% between 2007 and 2017 for all modes? Source: US Census Bureau (ACS 5-year estimate)

The Highway System Plan meets the requirements of RCW 47.06.030: System Preservation, Maintenance, Capacity & Operational Improvement, Scenic & Recreational Highways, and Parks & Trails.

...Washington's population will surpass 9 million by 2040? Source: Office of Financial Management

Why update the HSP now?
WSDOT last updated the HSP 12 years ago, and it is time for an update! WSDOT needs a plan to:

- Address today's needs – including changes in technology, preservation and maintenance shortfalls, demographic shifts, and state fish passage mandates.
- Reflect a modern strategy – WSDOT's Practical Solutions approach prioritizes overall system performance and maintenance over expansion.
- Anticipate future needs – including system resilience, clean energy, and the rise of autonomous vehicles.
- Describe the role of highways – Interstates, US routes, and state routes are part of an integrated multimodal transportation system.



Project overview

PRR worked with WSDOT to plan, promote, and implement 25 virtual workshops throughout WSDOT's seven regions regarding the State Highway Plan. Workshops included three sets of workshops:

- First set: high-level conversations for the general public
- Second set: focused on planning professionals, emergency responders, and local officials in each region and will ask them to imagine different possible futures for the highway system
- Final set: equity workshops engaging historically underserved community members about the outcomes of different funding decisions will be for members of their particular communities

Why it matters: Feedback received from these workshops informed the Highway System Plan that provides guidance on funding decisions to WSDOT, local communities, planning organizations, and the legislature over the next two decades.

5 NATIONWIDE STAKEHOLDER ENGAGEMENT FOR LONG-DISTANCE PASSENGER RAIL STUDY

Client Name

Federal Rail Administration

Year

2022-Present

Fee received

\$2M

Firm

Jacobs

Demonstrated experience

Community engagement



Gathering feedback from a regional stakeholder group.

Project overview

As part of the BIL, the FRA was tasked with evaluating previous long-distance passenger **rail routes** across the country and issuing a report to Congress by November 2024. Jacobs' public engagement team is overseeing the strategy and execution for engagement across the country and managing a team of national engagement staff. In addition to feedback gathered from regional stakeholder groups, the team also manages a database with thousands of comments from the American public focused on their desires for passenger rail. Jacobs is also managing all written materials, digital media, public information availability and correspondence. The Jacobs team is also leading all engagement with tribes, Amtrak labor unions and Class 1 Rail.

Why it matters: Jacobs brings experience overseeing complex, nationwide engagement from forming and coordinating meetings to reviewing technical findings and helping shape recommendations for inclusion to Congress.

ECONOMICS, MARKETS, AND COMMODITIES

1 COVID-19 FREIGHT STUDY

Client name

MasDOT

Year completed

2022

Fee received

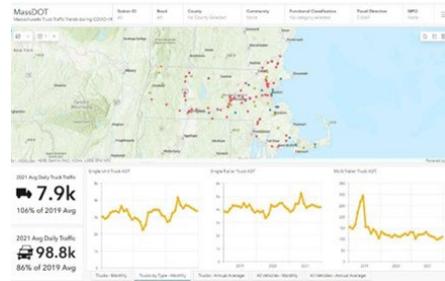
\$350K

Firm

Jacobs

Demonstrated experience

Economics, markets, and commodities



Dashboard page showing Massachusetts truck traffic trends during COVID-19.

Project overview

Jacobs evaluated pandemic-related shifts and prepared the **state freight network** for present and future disruptions based on observed and anticipated impacts of COVID-19. The study included analyzing existing conditions; assessing data that outlined the impact of the pandemic on the **freight network** as well as opportunities to advance the vision of the 2017 Freight Plan; and developing key findings.

Why it matters:

- Assisted in delivering impact-certainty about the future matrix, enabling OTP to prioritize which strategies need further attention in the next Massachusetts Freight Plan.
- Developed user-friendly dashboard that assists in identifying **truck volume** trends by vehicle, station ID, **road**, county, community, MPO, and functional class.
- Detailed **safety dashboard** that summarize commercial motor vehicle crashes by type to identify patterns.

2 M-580 CORRIDOR MULTIMODAL FREIGHT NETWORK OPTIMIZATION STUDY

Client name

CalTrans

Year completed

2019-2021

Fee received

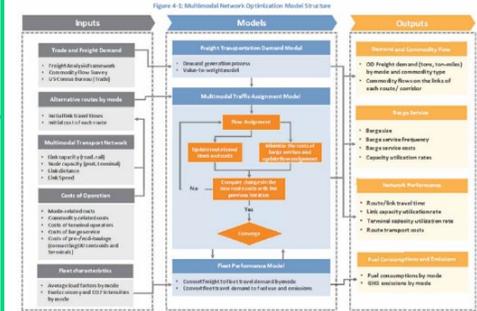
\$350K

Firm

CPCS

Demonstrated experience

Economics, markets, and commodities



Multimodal network optimization model structure.

Project overview

Mode-shift study in the “opposite” direction of the LSRDR project: moving cargo from road and rail to water. Conducted an **economic study** examining potential opportunities to route cargo from **trucks to barges** on the I-80 and I-580 corridors in California. CPCS examined **economic feasibility** of diverting trucking traffic flows for specific commodities from trucks to inland waterways and rail. CPCS constructed a total logistics **cost model** to understand whether the markets for these **commodities (such as agricultural products)** could accommodate mode shifts and the potential differences in shipping costs between different modes.

Why it matters: Project documented capacities and characteristics of **road, rail, and barge infrastructure**; assembled information on current freight flows including identification of specific commodities for **mode shift**; developed a modal diversion model to understand if mode shift was economically feasible from a private market perspective; and developed a business case for a re-launch of the M-580 service.

3 I-20 TEXAS CORRIDOR STUDY

Client name

TxDOT

Year completed

2023

Fee received

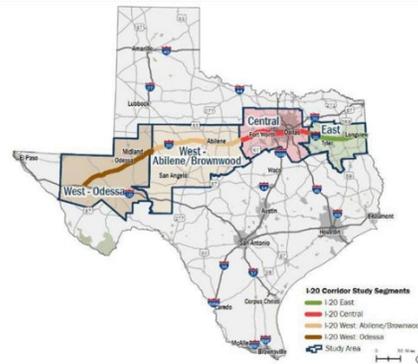
\$4.7M

Firm

Jacobs

Demonstrated experience

Economics, Markets, and Commodities



Defined I-20 corridor study area by segment.

Project Overview

I-20 is an **important route for goods** and people moving from the Texas-Mexico border to the Texas-Louisiana border, comprising 635 miles across 22 counties, 30 cities, and 5 MPOs. Jacobs developed a corridor implementation plan that identified multimodal needs and prioritized improvements for the short, medium, and long-term. The study proposed solutions that address transportation challenges, environmental constraints, **economic development, freight demand**, multimodal transportation provisions, alternate routing, system resiliency, and land use considerations.

Why it matters:

- **Economic impacts study** was based on two separate analyses: an Economic Impact Analysis (EIA) and a benefit-cost analysis (BCA). EIA evaluated impacts of improvement projects on the corridor's economy. BCA determined macro-level benefits from capacity improvement projects and their associated impacts.
- Used **big data** providers such as StreetLight and Geotab.
- Explored alternative and innovative funding opportunities to advance improvements identified along the corridor.

4 SECOND SUPPLEMENTAL EIS FOR THE KALAMA MANUFACTURING AND MARINE EXPORT FACILITY

Client name

WA Department of Ecology

Year completed

2020

Fee received

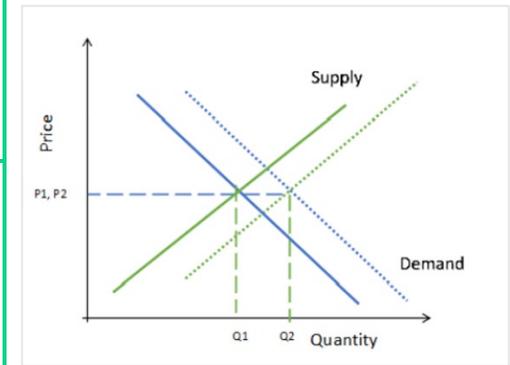
\$72K

Firm

Greene Economics

Demonstrated experience

Economics, Markets, and Commodities



Graph illustrating supply and demand with increasing demand in a competitive market.

Project Overview

Evaluated impacts of a proposed methanol production and export facility along the Columbia River. Analysis focused both on how production **cost shifts** would play out in the global **commodity markets**. Developed an interactive tool to assess varying outcomes based on user-defined inputs. Outcomes included both facility production and shipping as well as global greenhouse gas emissions, with and without the facility.

Why it matters: Similar to the LSRDR study, this analysis addressed the **competitive status of commodity markets** based on changes in production costs for global markets. Also relevant to the proposed study, this involved **lower Columbia River ports**. Finally, this study addressed both carbon costs and production costs under a with, and without project framework.

3. QUALIFICATIONS OF PROPOSED PROJECT MANAGER

Experience managing multidisciplinary resources on similar contracts. Seth has led hundreds of previous traffic impact studies—he is adept at leading multidisciplinary teams with expertise including traffic operations and impact studies, goods movement, and economics. He guides teams through the project process, facilitating collaboration and partnership, navigating challenges, and delivering on time and on budget. He is an experienced speaker and meeting facilitator having successfully led large projects, conveying complex ideas tailored for executive audiences and building consensus around decisions, including the Otay Mesa East Land Port of Entry where Seth led the project and the agency workshops building consensus on a preferred project with over 50 binational federal, state and local agencies.



Project management practices to meet WSDOT’s project delivery goals. Seth will leverage his experience on similar studies using established tools and processes. He will establish the refined project schedule, work plan and project management plan in under 30 days.

A. EXAMPLES OF PRIOR EXPERIENCE AS PROJECT MANAGER

Harbor Drive Multimodal Corridor Study | Port of San Diego | Project Manager | 2019-2021

Scope and responsibilities to this contract: Seth led the Port of San Diego Harbor Drive Multimodal Corridor Study to examine corridor between the Port of San Diego’s two cargo terminals, the Tenth Avenue Marine Terminal in San Diego and the National City Marine Terminal, known as San Diego’s Working Waterfront. The

project includes understanding the complex supply chain of various goods moving to and from the Ports, analyzing the impacts that these goods have on multimodal facilities in the corridor, including cargo ships, freight rail, and trucks that move goods to and from the terminals. The purpose of the study is to develop a set of multimodal improvements that balance costs, benefits and impacts to the community established as part of the Port Master Plan Update process.

Benefit to WSDOT: Researching complex supply chain characteristics of various commodities using multimodal transportation to develop a set of transportation improvements in a sensitive corridor with many stakeholders.

State Route 99 Multimodal Corridor Plan | CalTrans | Project Manager | 2023-Present

Scope and responsibilities to this contract: The 300-mile State Route 99 corridor serves the San Joaquin Valley of California, which is one of the Country’s largest agricultural areas. Truck volumes in the corridor exceed 25% in many areas as produce is transported to one of many inland ports where it is distributed via rail and truck throughout the world. The multimodal study will analyze the existing and future conditions in the corridor and develop a range of multimodal strategies to balance the needs of the agricultural industry, disadvantaged communities, tribal communities, and other stakeholders in the corridor.

Benefit to WSDOT: Analyzing a corridor that serves intense agricultural products and high truck traffic while working with a diverse set of stakeholders to develop a range of multimodal strategies.

Otay Mesa East Land Port of Entry Traffic & Revenue Study and Feasibility Study | CalTrans | Project Manager | 2019-2021

Scope and responsibilities to this contract: Seth led a binational team of architects, engineers and financial consultants to evaluate project alternatives, update the program of requirements and

develop concept plans and cost estimates and revenue forecast for Otay Mesa East and Mesa de Otay II proposed LPOEs and the associated transportation facilities on both sides of the border. The LPOE is a private public partnership (P3) that will include facilities for both private and commercial vehicles. The project involved extensive binational coordination between all partners/ stakeholders including a critical meeting and workshop structure, which ultimately led to a binational Preferred Project Concept Alternative accepted by both the United States and Mexican agencies.

Benefit to WSDOT: Experience successfully leading large projects and conveying complex ideas tailored for executive audiences; building consensus around decisions involving over 50 binational federal, state and local agencies.

B. FAMILIARITY WITH STATE/FEDERAL REGULATIONS/PROCEDURES

Seth serves as a regular lecturer at U.C. San Diego for teaching the transportation impact process for environmental practitioners. He is a former board member of the San Diego Section of Association of Environmental Professionals, and former Technical Chair for the San Diego Institute of Traffic Engineers. He has led hundreds of complex traffic studies using national methods from the Highway Capacity Manual.

C. ABILITY TO MANAGE SCHEDULE, SCOPE, BUDGET, AND CHANGES

State Route 52 Multimodal Corridor Study | San Diego Association of Governments | Role: Project Manager | 2021-2023

Ability to manage project schedule: Seth and his team used Microsoft Project to develop a baseline schedule at the point of execution as well as a detailed workplan to track the progress of the project updated on a weekly basis. Updated schedules were then provided with monthly project invoices, including a progress of actions to give SANDAG a clear forecast of the progress made and level of effort remaining.

Ability to manage scope of work/scope creep: During the study, Seth worked with SANDAG and consultant team to develop metrics and reporting mechanisms, including task order weekly project updates to track the study progress. The bulletin was a full-transparency, one-page tool designed to assess responsiveness (time from task initiation to execution); task progress and assignments. This tool was used at monthly project reviews and internal controls to maintain accountability during the entire process, applying a “no surprises” approach on the projects.

Ability to manage budget issues: Seth provided a detailed breakdown of metrics, progress, risk, and change on a monthly basis to the SANDAG project manager. These reports summarized contract amount, remaining budget, the amount expended to date, and anticipated work in the coming month. These reports were used to maintain transparency and accountability across the consultant team and the subconsultants.

Ability to manage changes that arise throughout the life of the project: In anticipation of a new Board, the client requested the consultant team pause the project for three months. Seth effectively “shut down” the consultant team during that period to preserve the budget and mobilized the team effectively to complete the project on budget and within the agreed duration of the remaining tasks.

D. LICENSES AND ACCREDITATIONS

- Certified Planner: American Institute of Certified Planners, 2010 (243154)
- B.S., Management Science Economics, University of California, San Diego

4. KEY TEAM MEMBERS QUALIFICATIONS

By partnering with the Jacobs team, WSDOT leverages focus, accountability, and expertise in the project positions.



Jamey Dempster, AICP

Deputy Project Manager

Understanding of WSDOT/Public Agency regulations and procedures

Recent experience managing a high profile WSDOT project from a legislative proviso, with staff in field

Why he's right for the role:

Jamey's analysis and policy work spans various transportation modes and includes performance measurement, program development and evaluation, public transportation systems and corridors, financial and economic analysis, and facilitating regional planning processes.

MAX Tunnel Project

Oregon Metro | 2018-2020 | Deputy Project Manager

Explored scope and cost required to build a rail tunnel beneath the Willamette River. Jamey worked with a blended agency team to deliver public documents and a fast-paced advisory group schedule. Jamey led the origin-destination analysis and oversaw tunnelling, project development, equity analysis, ridership, and conceptual engineering risk.

OR-8 Forest Grove Safety Improvements Plan

Oregon DOT | 2020-2021 | Project Manager

Led planners and engineers to identify capital improvement projects on the five-lane arterial, supporting ODOT and City goals to enhance Tualatin Valley Highway safety. Jamey integrated traffic safety analysis, access management strategies and community engagement into project solutions.



Tung Le

Traffic and Transportation

Understanding of WSDOT/Public Agency regulations and procedures:

In-depth knowledge of WSDOT-specific policies, programs, and corridor congestion gained from 30+ years of WSDOT/local agency project delivery

Why he's right for the role:

Tung brings over 30 years of experience in WSDOT and local agency multimodal transportation planning and engineering. He possesses in-depth knowledge of WSDOT policies, programs, and corridor congestion projects. Tung has managed many projects applying the Practical Solutions approach to develop solutions and strategies for capacity improvements, transit service enhancements.

I-5/Tacoma Mall Boulevard Corridor Access Study

WSDOT | 2018 – 2020 | Project Manager

Study identified strategies and solutions using WSDOT's Practical Solution approach. Forecasted and modeled traffic demand informed by StreetLight trip pattern information, analyzed future traffic conditions, and identified alternatives for evaluation, screening, ranking and prioritization.

SR 16, Tacoma Narrows Bridge to SR3 Congestion Study

WSDOT | 2016 – 2018 | Project Manager

Managed this congestion study that examined transportation issues along West Sound corridors. Tung oversaw traffic analysts to develop a regional travel demand model and evaluated existing and future operating conditions to identify needs and deficiencies. Tung successfully developed short-, mid-, and long-term solutions and strategies for improvements along the corridors to increase resiliency, reduce congestion, and preserve the transportation system.



Ryan White, AICP

Traffic and Transportation

Understanding of WSDOT/Public Agency regulations and procedures:

Washington State land use planning and permitting experience.

Why he's right for the role:

Ryan has lead various freight and passenger transportation planning projects across the United States. He served as Vice President for the NYC Economic Development Corporation (NYCEDC) Planning Division where he led a multimodal freight plan to create jobs and improve roadway safety in NYC by investing in rail and maritime infrastructure. Ryan will leverage this and his background working environmental permitting, land use, and scenario planning on this transportation impact study.

FreightNYC

NYCEDC | 2017 – 2020 | Project Manager

Ryan managed the day-to-day project team, overseeing the plan vision by identifying freight industry trends, describing the existing freight ecosystem of New York City—including modal networks, jobs, and challenges—collaboratively identifying the goals of the plan through internal and external engagement, analyzing freight data, and identifying recommendations for optimizing how goods are distributed. Additionally, FreightNYC included quantifying the number of jobs created as a result of the new infrastructure investments, the annual greenhouse gas and particulate matter reductions based on the overall reductions in truck vehicle miles travelled. Finally, the scope involved planning and designing a new 5-acre marine terminal and a new rail transload facility.



Zach Wieben

Traffic and Transportation

Understanding of WSDOT/Public Agency regulations and procedures:

Comprehensive understanding of WSDOT and local public agency regulations/procedures; previous experience working with tribal interests

Why he's right for the role:

Zach specializes in traffic operations analysis. He has extensive experience modeling corridors to assist with planning and design efforts. He has worked on developing and screening alternatives both at a qualitative and quantitative level through developing MOE's with clients and other stakeholders.

Kalispel Master Plan

Kalispel Tribe of Indians | 2022 – Present | Traffic Analysis

Responsible for Synchro and Sidra analysis conducted as part of the Kalispel Master Plan, which analyzed traffic impacts of 200+ acres of commercial, residential, and industrial uses.

SR 526 Corridor Study

WSDOT | 2018 | Traffic Analysis

Developed data collection plan, initial VISSIM model coding, and Synchro analysis this study focused on impacts of diverting trips from the SR 526 corridor to local by-pass routes as well as benefits to freight travel.

Frederickson 310 Traffic Impact Analysis

Kimley-Horn | 2022 | Traffic Operations

Zach supported the prime consultant in traffic operations analysis for over 4 million square feet of new industrial warehouse space. The analysis included Synchro and SimTraffic modeling along four major and collector arterials.



Neha Rathi

Travel Demand Modeling

Understanding of WSDOT/Public Agency regulations and procedures

FHWA and WSDOT guidelines for forecasting; deep understanding of state's corridor congestion and Interchange Justification Report

Why she's right for the role:

Neha brings 19 years of experience specializing in state-of-the-art travel demand modeling and traffic simulation techniques. Her work focuses on helping agencies make infrastructure decisions with the support of sound modeling and analyses skills. Neha brings an understanding and experience on varied projects in transit planning, highway route and interchange design; tolling studies, city, and regional growth plans; and environmental assessments.

North Spokane Corridor Study

WSDOT | 2015 – 2017 | Travel Demand Modeling Lead

Updated the WSDOT travel demand model based on the review and developed the base year and future year regional travel demand model. Prepared the forecasts for future year alternatives and developed performance matrix for the future year alternatives using different performance measures identified to help comparing the alternatives.

I-5/SR-57/SR-91 Triangle Network Integrated Corridor Management – Analysis, Modeling and Simulation

CDOT | 2021 – Present | Project Lead

Leading traffic modeling to implement integrated corridor management strategies to effectively manage the traffic events and incidents in the triangle network. Work closely with client to ensure smooth transition of input data and final product of calibrated existing conditions traffic model.



Dan Seedah, PhD, PE

Freight Planning and Analysis

Understanding of WSDOT/Public Agency regulations and procedures:

Deep understanding of FHWA Freight Planning Requirements

Why he's right for the role:

As a industry-leading expert in his field, Dan understands the importance of a holistic approach to transportation planning, freight modeling, traffic forecasting, data integration, and geospatial analysis. His experience with freight transportation planning includes commodity flow analysis, network modeling, geospatial analysis, economic analysis, truck parking assessment, and algorithm development for data processing.

I-20 Texas Corridor Study

TxDOT | 2020 – 2023 | Deputy Project Manager- Technical Analysis

The study identified multimodal needs and prioritized improvements that facilitated the movement of goods and people from the Texas-Mexico Border to the Texas-Louisiana border. The study identified and proposed solutions to transportation challenges, environmental constraints, the impact of economic development activities, freight demand, and multimodal transportation provisions. Other considerations for the corridor study include alternate routing and system resiliency, right-of-way and land use considerations, pavement management/maintenance strategies, alignments and alternatives, conceptual cost estimates, assessment of funding options, scenario planning, and a corridor implementation tool.



Scott Drumm

Freight Planning and Analysis

Understanding of WSDOT/Public Agency regulations and procedures:

Proven collaborator with WSDOT on maritime development projects; external board member for Pacific Northwest Transportation Consortium

Why he's right for the role:

Scott brings relevant expertise having previously worked as the Port of Portland's Director of Strategy and Research for 17 years. Responsibilities included managing strategic planning across the Port and supporting commercial and trade strategy. Scott supported various maritime and mode shift-related projects.

Washington State Freight System Plan Update

WSDOT | 2021-2023 | Maritime Specialist

Developed a profile of Washington's maritime transportation systems, including inventorying port assets, assessing commodity flows on Snake and Columbia Rivers, and identifying transportation needs for both the inland river and coastal port systems. The plan identifies maritime cargo flows and assets, needs, and issues for future investment.

Portland-Vancouver Regional Commodity Flow Forecasts

Port of Portland | 2000-2015 | Project Manager

Managed project on behalf of public agencies (e.g., Port of Vancouver, WSDOT, Washington). Forecast included commodities—to, from, within, through—the Portland/Vancouver area by individual mode (barge). Oversaw analysis of maritime commodity flow data, and engagement with Columbia and Snake River ports and stakeholders.



David Sathiaraj, PhD

Inland Waterways Analysis

Understanding of WSDOT/Public Agency regulations and procedures:

N/A

Why he's right for the role:

David leads the Data Science group at TRABUS Technologies where he has developed the River Information Systems Enterprise (RISE) project with the USACE and USCG. As part of the RISE effort, He led the WAP and LSAT projects in developing data-driven dashboards for lock and dam management and improving river traffic logistics.

Lock Status Analysis Tool (LSAT)

USACE | 2022-Present | Project Manager

Lead data science efforts in collecting, analyzing, and display of disparate river, lock and barge data sources and help in planning preventive maintenance tasks at locks/dams and reservoirs. LSAT tool encompasses 208 locks and 418 reservoirs in the U.S. and involves analyses of tonnage volume and barge traffic to plan maintenance repair tasks and flood risk management projects. Four locks in the Snake River are part of the LSAT tool.

Waterway Action Plan (WAP) and RISE

USCG and USACE | 2019-Present | Project Manager

Develop a data dashboard that provides situational awareness and helps river traffic management along the Ohio and Mississippi rivers. Project Relevance: River level traffic studies, lock and dam analyses and barge traffic analyses.



Donald Ludlow, AICP

Economics

Understanding of WSDOT/Public Agency regulations and procedures:

Proven experience with WSDOT, Washington State, and federal regulations and procedures, including the Washington HEAL Act

Why he's right for the role:

Donald is a nationally recognized expert in logistics and freight planning and has advised federal, state, regional, and corporate clients on a wide range of multimodal strategies. He has advised WSDOT on its statewide freight activities, truck operations data, truck parking, and freight infrastructure planning.

Washington State Freight System Plan Update

WSDOT | 2021-2023 | Project Manager

Led creation of WSDOT's 5-year update to its freight transportation and investment plan. The plan documented commodity flows, truck, rail, and barge traffic volumes, infrastructure needs and issues, and future investment strategies for WSDOT. This project also included an initial assessment of the potential commodity flow impacts of closure of Columbia and Snake River locks and dams.

Salisbury Port Feasibility Study

City of Salisbury, MD | 2020 - 2021 | Project Director

Oversaw this study examining potential market and engineering feasibility of investments in maritime infrastructure. This study used truck, rail, and maritime commodity flow and traffic volume information to identify specific trade lanes and commodities that could benefit from a mode-shift from land to water, and infrastructure investments needed to facilitate this mode shift.



Erika Witzke

Commodity Flow Analysis

Understanding of WSDOT/Public Agency regulations and procedures:

Proven experience with WSDOT, Washington State, and federal regulations and procedures, including the Washington HEAL Act

Why she's right for the role:

Erika brings over 25 years of experience in multimodal freight planning, performance measurement, and project feasibility. She has led dozens of studies related to rail, truck, and maritime for states as well as other projects to better connect landside transportation systems to inland waterways. Erika chairs the TRB Inland Water Transportation Committee and is the former Vice Chair of TRB's Agriculture and Food Transport Commodity.

Washington State Freight System Plan

WSDOT | 2021-2023 | Commodities Specialist

Provided technical guidance and QA/QC of the plan's documented commodity flows, truck, rail, and barge traffic volumes, infrastructure needs and issues, and future investment strategies for WSDOT. Plan included initial assessment of potential commodity flow impacts of closure of Columbia River locks and dams.

Illinois Maritime Transportation System Plan and Economic Impact Analysis

IDOT | 2019-2020 | CPCS Project Manager

Developed guidance on maritime infrastructure policy and program solutions to address needs and issues for the inland maritime navigation on the Mississippi, Ohio, and Illinois river networks. Conducted a peer state review of funding, organization, and other maritime system best practices.



Jason Ruth, PE, SE, PMP

Rail Concepts

Understanding of WSDOT/Public Agency regulations and procedures:

Washington State Rail Plan; BNSF and UPRR Public Projects Manuals; BNSF Guidelines for Industry Track Projects; UPRR Industrial Track Specifications

Why he's right for the role:

Jason has spent his 27-year career leading teams in the delivery of transportation design and construction projects for cities, counties, states, transit agencies and Class 1 Railroads across the Western U.S. He has an extensive background in leading the design of highway and municipal roadway projects across the west with a specialty with projects that interact with railroads.

West Vancouver Freight Access

Port of Vancouver | 2014 – 2019 | Sr. Project Manager

Led design and construction of this \$250M project to enhance access to the Port and add 26-miles of new rail infrastructure. Construction required complex staging, allowing Port tenants to continue receiving rail service from BNSF and UPRR.

BNSF Vancouver Bypass

BNSF | 2014 | Program Manager

Coordinated design, permitting, bidding, and construction award of \$150M in rail infrastructure for BNSF Railway including rail expansion, street improvements, and utility relocations. Managed various design activities.

Grade Separation

WSDOT | 2017 – 2019 | Construction Engineer

Project required extensive coordination with BNSF for construction staging since the mainline tracks could not be taken out of service while the rail bridge was constructed.



Patrick Cooper, PE

Highway Concepts

Understanding of WSDOT/Public Agency regulations and procedures

WSDOT Intersection Design; WSDOT Roadside Safety; WSDOT Highway Runoff Manual; WSDOT Context Sensitive Solutions; WSDOT Design Documentation; WSDOT Special Provisions Program; WSDOT EBase estimating system

Why he's right for the role:

Patrick is a design manager and civil engineer specializing in large interstate and state highway improvement, state fish passage, and state preservation projects. He is well versed in WSDOT project development process, policies, and procedures. His experience comprises projects and coordination of work in WSDOT's Eastern, Northwest, and Southwest regions.

I-90 Snoqualmie Pass East, Hyak to Easton

WSDOT | 2006 to 2019 | Design Lead

Provided design management and coordination for this complex, 6-lane interstate freight route highway. Project provided safety and mobility improvements comprising relevant scope such as new pavement, wildlife overcrossing structures, geotechnical, utilities, hydrology and an environmental impact statement.

SR 224, Red Mountain Vicinity Improvements

WSDOT | 2020-Present | Coordination Lead

Reviewed planning studies, conducted reviews of roundabouts, documentation, 30%, 60%, 90% and final PS&E submittals, right of way plans, and pedestrian facilities.



Jeff Shoemaker, PE

Utilities

Understanding of WSDOT/Public Agency regulations and procedures:

Recent experience on WSDOT project following WSDOT Design Manual and others.

Why he's right for the role:

Jeff brings relevant experience in transmission and distribution, substation and structural/foundation design along with straight transmission line design on work with different utilities all over the country. He will leverage his specialized understanding of overhead transmission and utility design/relocation across navigable waterways on this project.

SR 167 / I-5 to SR 509 Design-Build (15kV Transmission, Distribution, and Communications Relocation)

WSDOT | 2022-Present | Electrical Engineer

Provided engineering and design for the relocation of existing 115kV wood pole line with distribution and communications underbuild to accommodate a new highway overpass.

Transmission Crossing over the Susquehanna River

PPL Electric | 2020-2022 | Lead Electrical Engineer

Complex transmission relocation over waterway comprising existing transmission, distribution, and communications crossings; residents/businesses; 125-foot cliff; 200-foot-tall crossing poles to accommodate a span of over 2,000 feet; required FAA markers, clearance for traversing USACE priority waterways and enhanced vibration mitigation measures.



Elizabeth Guevara

Community Engagement and Communication

Understanding of WSDOT/Public Agency regulations and procedures:

Understands WSDOT communication protocols and procedures having provided outreach efforts on behalf of WSDOT (e.g., SR 520 Floating Bridge and HOV, SCR GEC); well versed in inclusive engagement standards provided in WSDOT's draft community engagement plan.

Why he's right for the role:

Elizabeth has led community engagement efforts for numerous projects and initiatives that engage public, businesses, non-profit organizations, community groups, associations, and other interested parties. She has been providing outreach efforts as part of WSDOT's SCR GEC, and understands boots-on-the-ground support for agencies allows her to have a unique understanding of what is needed to deliver a project successfully, whether its building consensus with communities or working through complex technical issues with project teams.

SCR GEC

WSDOT | 2023-Present | Communications Manager

Leading Jacobs community engagement outreach efforts in tandem with PRR for this task-order based contract serving South Central and Eastern Washington including inclusive engagement, focused on how to meet people where they are and distill complex processes and technical information during planning, design, and construction.

SR 520 Floating Bridge and HOV

WSDOT | 2015-2016 | Construction Communications

Led design-builder's communication with the public and stakeholders during construction.



Laura Labissoniere Miller

Community Engagement and Communication

Understanding of WSDOT/Public Agency regulations and procedures:

Deep understanding of WSDOT's values, style, and communications practices that has led to her extensive experience partnering with the agency on a variety of long-term projects.

Why she's right for the role:

Over the past 15 years, Laura has worked extensively with public agency leaders and the communities they serve, overseeing communications and engagement programs for a range of clients including the Washington State Department of Transportation and local cities. Laura brings communications expertise at all phases of project delivery—from environmental review, through final design and into construction.

Community Engagement for Statewide Planning

WSDOT | 2020 – Present | Engagement Lead

Laura leads community engagement to inform statewide plans and programs, including the Human Services and Public Transportation plans, facilitating conversations between WSDOT and community partners.

2040 Long Range Plan

WSDOT | 2016 – 2018 | Engagement Lead

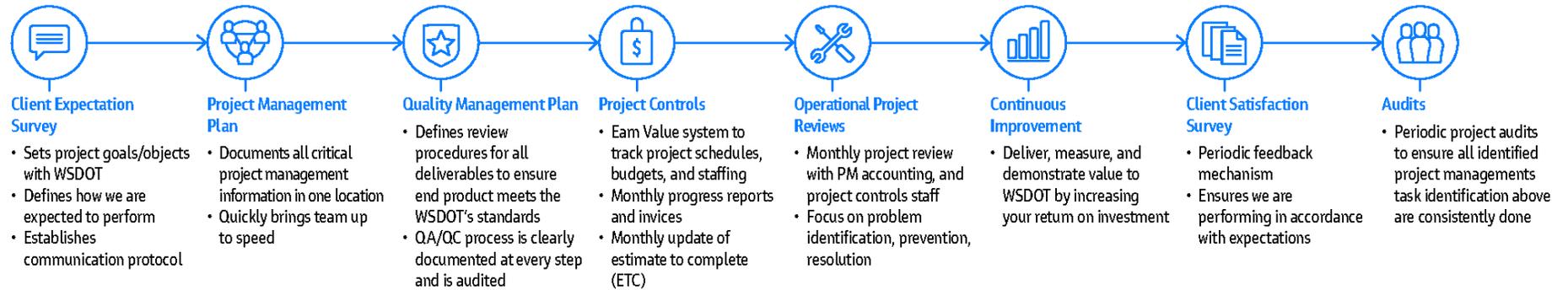
Laura led robust community engagement centered around two milestones: identification of issues and priorities and review of a Draft Long-Range Plan. Efforts included developing and implementing a community engagement plan focusing on long-term planning efforts associated with waterways and transportation.

5. FIRM'S PROJECT MANAGEMENT SYSTEM

Project Management System. We know WSDOT has specific performance standards and expects consultants to provide superior project management, deliver quality work, and adhere to high standards. Jacobs is a project-centric organization that focuses on sustained client loyalty; our staff and our team partners have a proven history of delivering to your standard for nearly three decades. Project Manager Seth Torma has diverse delivery experience from executing and managing projects over the past 15 years. Jacobs has a disciplined project management system we use on all projects, as shown **Figure 5.1: Jacobs' Project Management System** on the next page. This system establishes our standards, procedures, and protocols and focuses on driving predictability and certainty into project delivery to foster success of our project teams through consistent use of best practices. Our project managers complete formal training through Jacobs' Project Management Advancement Program, and are accredited to manage projects for Jacobs, which provides WSDOT with consistent, transparent, and quality project delivery.

Quality Assurance/Quality Control Processes. Paramount to executing an effective QA/QC process is work planning and the effective defining and sequencing of deliverables. In conjunction with our Project Manager and the Jacobs Northwest Region Quality Manager, our Deputy Project Manager, Jamey Dempster, will develop a QA/QC plan that is tailored to the deliverables of this project. The plan will define the schedule and scope for all quality checking and review activities, and the requirements for an objective, comprehensive check, and review of the deliverables. Additionally, Jacobs employs a technical editor and graphic designer for all reports to ensure final products are understandable and easy to consume. We also apply the QA/QC process to the work product of our subconsultants.

Figure 5.1: Jacobs' Project Management System



The tenets of our project specific QA/QC process are:

- Perform the work correctly the first time
- Check all deliverables with a qualified second set of eyes using a defined process. All field-collected spatial and tabular data will be checked by a qualified analyst who is not part of the field team at WSDOT's preferred interval
- Technical edit for readability
- Audit for compliance with defined criteria

Additionally, Jacobs' standard practice is to conduct an initial Client Expectation Survey (CES) at the start of the project to establish client expectations on 12 measures of project execution, including scope, schedule, and budget adherence. Senior management not involved with the project then conduct a Client Satisfaction Survey (CSS) with the client annually, or sooner if conditions warrant, to confirm that the project team is performing to the client's expectations against the 12 measures. If the CSS identifies an issue, we develop a Performance Improvement Plan (PIP) in consultation with the client to address the issue. We then monitor performance by the project team against the PIP until we resolve the issue to the client's satisfaction.

Where we've done it: For our WSDOT Olympic Region GEC and Toll Division GTC, we prepared a program-level quality management plan (QMP) and Project Procedures Manual (PPM),

respectively, that defined roles and responsibilities, deliverables matrix, check/review, and assurance verification procedures, and applied it to all program task orders. All staff receive the QMP/PPM during onboarding, giving them a consistent set of QC procedures across all projects, enabling efficient assurance verification.

Budget/Scope Tracking Process. For each task order, we develop internal project execution plans (PEP) aligned to the work plan that confirm the scope of work, budget, project team, schedule, roles and responsibilities, communication protocols, work breakdown structure (WBS), quality plan, risk management, change management, and safety protocols that will govern our work. The PEP provides the foundation for all measurement and monitoring of scope and budget and ties in with the project schedule by producing an earned value metric to track progress against the deliverables. The PEP is captured on a web-based platform called Polaris and is available to all internal team members. On a monthly basis, Seth will participate in internal operational project reviews (OPR) with senior management and our internal project controls to review status of all PEP elements.

Scope Monitoring. We will divide the project scope into a logical selection of sub-tasks with assigned WBS. Each WBS task includes a responsibility matrix, assumptions, activities, and deliverables. We will track each of these key components on a project baseline

schedule and in periodic meetings with the WSDOT project manager. This enables us to break the project into manageable pieces, anticipate and mitigate scope creep, feed percentage complete into the MS Project schedule, and keep you fully informed on our progress. Our scope monitoring is designed for early identification and communication related to emerging risks, ongoing tracking of progress, open communication internally and with the client about changing conditions and needs, and maintaining a change log as necessary to document scope adjustments.

Budget Monitoring. Seth will use Jacobs' toolbox of web-based resources, such as Polaris and Jacobs Analytics, to manage the project finances. Project financial information is updated weekly, allowing Seth and Jamey to clearly see charges expended on the project and maintain clear roles and spending. The project management team will provide updates on budget monthly and as needed, a 1-3 month look-ahead, and a budget plan to project completion. Seth will bring the project monthly to project controls to assess overall status, estimated budget to completion, and estimate at completion. This helps identify issues early and identify mitigations with the full management and controls teams.

Where we've done it: Seth has managed dozens of projects and currently all are on time and on or under budget. He also develops project execution plans and participates in monthly project reviews. Jamey manages successful projects and will support the budget monitoring, reporting and delivery solutions.

Scheduling Program/Process. Jacobs teams use Microsoft Project, Primavera and Excel to support project scheduling needs at all levels; specific software is based upon client preference. Schedules are built with the understanding that they will be used to communicate time and logic elements of the project with the consultant team and WSDOT. The schedule will define all work activities, durations, and constraints, including all external interfaces, at the task level. It will also provide "rollups" of work

items so they can be understood and used by all project participants.

Where we've done it: Seth used Microsoft Project to develop the schedule for SANDAG's State Route 52 Multimodal Corridor Study, CalTrans' State Route 99 Multimodal Corridor Plan and Otay Mesa East Land Port of Entry Traffic & Revenue Study and Feasibility Study.

Interaction with Internal Team. Effective, targeted communication is critical for efficient, timely project delivery. We have structured our team for clear lines of communication and responsibility, providing key personnel in positions of responsibility with clear roles. As mentioned, the foundation of our project execution is the PEP. The PEP guides the project team and confirms that the team follows project procedures properly. In addition to the PEP, tools and processes we use to promote clear communication with our internal project team include:

- An internal kickoff meeting held at the start of the project to confirm expectations, goals, and objectives, quality plans, communication protocols, staff roles and responsibilities, and performance measures.
- Coordination meetings held regularly to review project progress and provide opportunities to proactively identify and address any concerns.
- In-person meetings will be held as needed at the Jacobs Bellevue, Yakima, or Spokane offices, or WSDOT offices, as most appropriate for attendees and agenda.
- Coordination meetings will be held regularly between Seth and WSDOT's project manager to review project progress and budget and provide opportunities to proactively identify and address any concerns.

Interaction with Client. We view WSDOT and Jacobs' relationship in managing and delivering projects as a partnership. We know that for us to be successful we need to be aligned. We have selected key project staff throughout the organization structure

that have extensive experience working on WSDOT projects, and know how to effectively coordinate the team, schedule, and needs of the project. Seth will be the primary point of contact for the project and contractual discussions and consultant team management. He will work with WSDOT to establish the project's scope, schedule, and budget. Our team members will integrate and interact with WSDOT staff following communications protocols established in our PEP, including the means, methods, and frequency of our interactions with WSDOT's staff.

Interaction with Stakeholders. At Jacobs, we believe individuals and communities affected by a project, especially those who have been historically marginalized, must have a voice in how infrastructure decisions may affect their lives and livelihoods. Jacobs brings experience supporting our clients with large, inherently challenging projects with diverging opinions. Removal of the dams along the Lower Snake River is expected to benefit salmon and to impact surrounding communities, positively and negatively. Jacobs is committed to engaging individuals and organizations bringing a wide range of perspectives on the future of the river and the regional communities that depend on it.

We will work alongside WSDOT to present project facts, using methods accessible to all, and solicit feedback. We will strive to hear and document priorities and concerns of private landowners, ports, conservation districts, farmer and ranching interests, Tribal governments, local and regional municipalities, and others. We recognize that additional effort may be required to engage those historically marginalized. We understand WSDOT's values and commitments to equity and transparency. Jacobs and WSDOT have successfully communicated the impacts of complex and controversial projects, such as SCR's Highway 97 and SR 240 Integrated Scoping public outreach. We will gather and share information, facilitate conversations, *and ensure the participation process is robust, transparent, and provides meaningful feedback.*

6. PROJECT DELIVERY APPROACH

A. APPROACH TO DEVELOPING A WORK PLAN

Understanding the transportation network after removing the Snake River dams requires a well-coordinated approach that focuses the Jacobs team's innovative thinking and subject matter expertise to deliver compelling, accurate information.

Work Plan Development. Jacobs will follow an intentional process, incorporating early feedback and working in partnership with WSDOT. These steps include:

- 1. Create draft work plan.** This document will define the scope, schedule and budget for the project supported by Jacobs-led mini-workshops with WSDOT. Jacobs will incorporate early feedback at this stage. We will complement the work plan scope with a deeper dive on community engagement, along with project protocols, internal communications and change management to guide project execution.
- 2. Hold kick-off meeting.** The Jacobs team key staff will meet with WSDOT to make introductions and review project goals, defining success, key dates, methods, stakeholder needs and data sources.
- 3. Refine the work plan.** Jacobs team will take the kick-off meeting information and refine the workplan. We will work closely with PRR to create a dedicated Community Engagement Plan, with details on how and when we engage key stakeholders, the general public, and agency partners. The Jacobs team will work closely with PRR to ensure an interwoven process that ensures technical deliverables follow a clear path to the public in a way that builds trust in the process and provides meaningful feedback into deliverables. This combined workplan will be part of the Project Execution Plan. The PEP includes the combined work plan and project management information such as data sharing, communication protocols, and a decision-making framework.
- 4. Share draft final work plan.** At this point the Jacobs team will bring the work plan back to WSDOT and schedule a working

meeting to review the information. The Jacobs team will be ready to bring the combined work plan to other agency partners or stakeholders, with time to review and provide requests, suggestions and questions to the team to help refine the work.

5. Final work plan. At this point, the starting work plan and other PEP elements will have been socialized and fully vetted with key partners, addressing the first step in the study to generate support and buy-in.

Work Plan Decision-Making. The work plan and Project Execution Plan are firmly established by engaging decision makers early. The plan is still a “living” document that will flex with the Study to meet the project goals. The decision makers will be involved not only during initial development but also in maintaining the work plan throughout the project, through intentional check-ins at milestones and transitions between phases. The Jacobs team will work to create and maintain a collaborative partnership with WSDOT to ensure success.

WSDOT as the client is the primary decision-maker on what must be addressed in the work plan, and can request changes to the work plan at any time. **Jacobs** will lead the consultant team and maintain an efficient and accurate process to work plan change requests, edits and approvals. **Key stakeholders** will be invested in the work plan and thus consulted for feedback or to share information, as needed, to ensure continued support.

Elements of the Proposed Work Plan. The milestone schedule for our proposed work plan is shown in **Figure 6.1: Phased Approach to the Work Plan.**

The Jacobs team organized the scope of work into four phases. Each phase includes all tasks as defined in the Request for Proposals. Each phase will include a distinct engagement and coordination phase as part of **Task 13 Community Engagement**, focusing a clear message and questions on topics under the phases. The community engagement activities and key topics are included under each phase.

6.1: Phased Approach to the Work Plan

Phase 1: Understand Needs	<ul style="list-style-type: none"> • Task 1 Goods Movement • Tasks 2-3 Existing and Future Vehicle Volumes • Convene and engage key stakeholders • Agency coordination 	<p>Milestones Convene engagement team Task Reports 1, 2,3,10 <i>Interim Report</i></p>
Phase 2: Solutions	<ul style="list-style-type: none"> • Tasks 4-6, Roadway, Highway, Utility Infrastructure • Tasks 7,9 Geology and Geography • Solutions and knowledge sharing workshops • Agency coordination (continued) • <i>Interim Report</i> 	<p>Milestones Task Reports (4,5, 6, 7, 9) Stakeholder workshops and coordination</p>
Phase 3: Evaluate Impacts	<ul style="list-style-type: none"> • Task 8,10 Regulatory and Transportation Safety Assessment • Tasks 11-12 Commodity and economic competition impacts • Engage key stakeholders for discipline-specific information • Agency coordination (continued) 	<p>Milestones Task Reports 8,10,11,12 Solutions Workshop</p>
Phase 4: Conclusion	<ul style="list-style-type: none"> • <i>Final Report</i> • Framework for future involvement • Agency coordination 	<p>Milestones Final Report Continued engagement workshop</p>

PHASE 1: UNDERSTAND NEEDS

Task 1. Existing Goods Movement | *Deliverable: Existing Goods Movement Report*

Task 1 will assess how goods move on the Snake River including barge traffic volumes and cargo tonnages. The team will work with TRABUS *RippleGo* service for up-to-date information used to validate and augment other sources. Sources may include:

- US Army Corps of Engineers' (USACE) Waterborne Commerce Statistics Data: Annual tonnages of river cargo by month and commodity type.
- USACE *Lock Performance Monitoring System Data*: monthly tonnage by barge, by commodity flow patterns.
- *Industry stakeholders' feedback*: ideas and needs from port authorities, river carriers, and trade associations.
- Columbia River System Operations *Final Environmental Impact Statement*: for alignment and gaps with previous studies.

Many commodities moved on the river system have first/last mile movements handled by other modes such as trucking and rail. Therefore, the maritime goods movement information will be supplemented with data from major transloading terminals on the Lower Snake River, Columbia River, and other areas. This information will be used in combination with the disaggregated county-level Freight Analysis Framework (FAF) data prepared for the **Washington SFSP** to map barge-handled commodity flow first/last mile moves to Washington's Freight and Goods Transportation System. Our experience disaggregating the FAF data will be used to develop and update the existing goods movement profile. For example, we will use agriculture data from the U.S. Department of Agriculture and the state Departments of Agriculture in Washington, Idaho, Oregon, and others as relevant to identify and translate relevant agricultural products into commodity movements.

Task 2. Existing Volumes | *Deliverable: Existing Transportation Volume Report*

Jacobs will collect the existing volume of traffic for the rail and highway networks impacted by the closure of the Lower Snake River dams. We will collect existing truck traffic data from **WSDOT's truck traffic counts**, with up-to-date data from Jacobs' partner **StreetLight Data** to break annual average truck traffic counts into monthly estimates. Railroad traffic volume information will be derived from **FRA Grade Crossing Reports**, which provide railroad-reported information on daily train traffic volumes. The Jacobs team will consult with railroads within the barge service market area to validate traffic volumes and transload facility locations and understand existing rail networks' capacity. This information will be combined with maritime traffic data from Task 1 including existing cargo and traffic volumes across all modes. **TRABUS *RippleGo*** will help collect data into one place to clearly understand barge travel times, variability, and volumes.

Task 3. Rail and Vehicular Volume Changes | *Deliverables: (1) Rail and Vehicular Volume Changes Report; (2) Transportation Changes Dashboard*

Jacobs will lead analysis of the highway and rail traffic effects due to added truck and rail demand on existing networks analyzed in Tasks 1 and 2. The analysis will take into account the movement of goods from barge to truck and rail, future baseline roadway and rail traffic, and dam removal transportation needs.

Diverted barge traffic. Jacobs will work with CPCS and TRABUS to understand river goods movement, considering that one barge can move the same volume of cargo as 15 railroad hopper cars or 58 trucks. Most trips from freight generators to the export terminals on the Columbia River are less than 250 miles, making trucking the more attractive choice for goods destined to bulk carriers. The Jacobs team will perform **sensitivity analyses** to show traffic impacts based on shares of truck and rail trips. CPCS's

disaggregation of the FAF data provides a starting point for converting expected commodity flows to the volume of trucks and railcars.

Future vehicle volumes. The Jacobs team will determine future volumes for non-freight traffic from existing regional and statewide travel demand models. Impacts of dam removal will be based on WSDOT's forecasting tool and assumptions identified in the Columbia River System Operations Final EIS. Relevant factors include transportation costs using the Snake Columbia Economic Navigation Tool (SCENT) and traffic shifts by mode or a combination of modes using the Transportation Optimization Model (TOM). Future commodity flow volumes will be forecasted using prior FAF commodity forecasts created in the Washington Freight System Plan between an assumed barge traffic end year to a 2050 horizon year.

Jacobs' partner Concord will support the Jacobs team in analyzing **traffic operations** on priority segments and interchanges, bringing their expertise in WSDOT traffic engineering. The Jacobs team will augment future demand using proprietary mobile data from partner **StreetLight Data**. This proprietary data package provides an empirical view of vehicle traffic levels, speeds, and travel times on specific roads of interest, plus the trip origins and destinations. Jacobs and StreetLight can offer custom dashboards that pair baseline and forecast traffic scenarios for all vehicles, trucks, and rail in intuitive, external-facing ways to illustrate complex travel data.



Example of a StreetLight Data dashboard.

Dam construction and removal. Jacobs has first-hand practical knowledge about dam removal and construction needs, given combined decades of dam infrastructure delivery. The team will identify type, size and duration of vehicle movements needed to decommission the dams. **Select Power Systems** will advise on the transportation needs for utility relocation or removal. The duration of construction and the associated impacts and costs are a function of five key factors outlined below.

Factors	Transportation Elements	
Sediment management	<ul style="list-style-type: none"> Volume Size fraction Contamination disposal 	<ul style="list-style-type: none"> Flush/haul exit distance Disposal distance
Dam structure	<ul style="list-style-type: none"> Volume (partial removal versus full removal) 	<ul style="list-style-type: none"> Disposal distance
Hydropower and utility infrastructure	<ul style="list-style-type: none"> Material and structure types Salvage 	<ul style="list-style-type: none"> Secure in place Demolition disposal Relocation
Future conditions	<ul style="list-style-type: none"> Site remediation 	<ul style="list-style-type: none"> Site restoration
Construction operations	<ul style="list-style-type: none"> Equipment and material Personnel 	<ul style="list-style-type: none"> Access

Task 10: Transportation Safety | Deliverables: Transportation Safety Impact Report

The Jacobs team suggests moving this task to follow Task 3 in which we analyze the future traffic volumes, and before starting Task 4 and 5 in which we identify infrastructure solutions. Our team has developed hundreds of analyses supporting facility plans and safety action plans around the country. We will use WSDOT **crash data, community engagement and StreetLight speed data** to identify fatal and serious injury crash hotspot locations on major goods movement corridors, with particular focus on rural areas. The analysis will guide teams in Task 4 and 5 to potential safety improvement strategies.

Task 13-1: Community Engagement Phase 1 | Deliverables: Stakeholder lists/database, Phase 1 Engagement Summary, Online Open House, events in Public Engagement Plan.

Jacobs and PRR will follow steps identified in the Community Engagement Plan and the intention of the HEAL Act to engage communities about transportation and other needs related to removing the Snake River dams. Potential contacts and audiences for engagement in this phase include rural area residents, agricultural businesses, workers, goods movement relevant businesses, carriers organized community groups, and government representatives. Key topics include:

- Transportation opportunities and challenges
- Goods movement trends and needs
- Future changes in transportation and goods movement

Jacobs and PRR have a toolbox of proven qualitative methods deployed on WSDOT planning efforts, including individual and small group interviews; intercept conversations at common gathering places to engage tribal audiences; freight shipper and carrier interviews; emailed questionnaires; and social media group notifications.

PHASE 2 DEVELOP SOLUTIONS

In this Phase the Jacobs team will develop and evaluate strategies to enable continued goods movement performance to, from and through the South Central Region. Solutions will address needs identified in the goods movement and overall transportation network in Phase 1. The Jacobs' team will ensure strategies evolve and build on information developed in this Phase.

Task 4: Roadway Infrastructure | Deliverables: Roadway Infrastructure Solutions Report

Jacobs' will use its combined team experience and relationships with WSDOT South Central Region staff, Headquarters Bridge and Structures Office staff, and HQ Geotechnical Office staff to develop strategies for **safe and resilient roadway infrastructure**. Task lead Patrick will lead the team through a process to build on travel origins and destinations with traffic volumes (Task 3) to determine roadway improvements needed over a 20-year horizon. This includes reviewing the Washington State Pavement Management System to identify existing depth of state route sections, preservation project dates, and site visits. Jacobs will coordinate with local agencies like Walla Walla, Columbia, Whitman and Garfield Counties to understand impacts to local road networks. Jacobs will evaluate intersection controls for turn lane and truck passing lane needs.

Jacobs will evaluate access for intermodal **loading and unloading facilities**. The rail infrastructure team will help identify staging areas and what interchanges may support this. The team will meet with Port commissioners to reflect operations and plans.

Finally, Jacobs will develop a **scoping level cost estimate** including engineering, design allocations, construction, operations, utility relocations and ROW using WSDOT's Cost Estimating Manual.

Task 5: Rail Infrastructure | Deliverables: Rail Infrastructure Solutions Report

Rail infrastructure connecting the Snake River in Washington includes both Class 1 Railroads (BNSF and UPRR) and shortline railroads. This task will build on the detailed goods movement evaluation in Tasks 1-3. Barge goods already require transloading at ports to storage facilities. If dams are removed, trucks would need new transload facilities. A detailed evaluation of new sites will be based on forecasted travel demand, traffic operations, and transportation needs by commodity. The transload sites may connect directly to existing rail infrastructure or located away from an existing rail line. Each proposed connection to existing rail infrastructure would be discussed with the servicing railroad to determine the terms of service, engaging departments that accommodate new customers' needs. Rail speed and capacity scenarios will be explored with the servicing railroad, factoring in future service requests affecting system capacity.

Task 6: Utility Infrastructure | Deliverables: Utility Infrastructure Solutions Report

The Jacobs team, working with Select Power Systems, will assess federal, state, and county maps and surveys to identify utility infrastructure with minimal to high impact from dam removal. The evaluation will include utilities and resources reliant on or serving the dams themselves, resulting in a comprehensive inventory and threat assessment. The team will create theoretical surveys to understand utilities, water, gas electric and communications. This will lead into an evaluation of the environmental and financial impacts of replacing or relocating infrastructure. The evaluation would consider the need for future surveying, studies, permits, right-away, engineering, materials, and installation etc.

Task 7: Geological and Geographic Challenges – Improvements | Deliverables: Geologic and Geographic Challenges for Improvements Report

The four dams inundated land that includes hundreds of sites with geological and geographic value. The Jacobs team will evaluate river drawdown effects on geologic stability of surrounding

transportation infrastructure. The Jacobs team brings expertise in geological, geographical, and environmental analysis, applied through desktop evaluations (e.g., past reports, existing data) and experience in field reconnaissance techniques. We recommend three steps to be implemented along the mainstem river channel and all tributaries within the reservoirs, and through critical geologic and geographic areas, such as the Columbia Gorge Scenic Corridor.

First, we will collect available **data** such as existing transportation and utility networks, reservoir extents and elevations, geologic hazard areas, and stakeholder input. The data would include publications and interactive mapping by the Washington Geological Survey, U.S. Geological Survey, and the Washington Emergency Management Division. Geologic hazards that may be impacted by, or may impact, infrastructure include tsunami evacuation and inundation areas, active faults, seismic risks (site class and liquefaction susceptibility), volcanic hazards, and landslide/debris flow potential. In addition, LiDAR data have been successfully used to identify previously unknown landslide areas and slopes with higher landslide potential.

Next, the Jacobs team will **overlay spatial data** to identify areas of potential geological risk, such as potentially unstable slopes, and geographic risk.

Third, the Jacobs team will conduct geologic field **reconnaissance** to ground-truth representative locations, drawing on the combined experience of the full team. The locations and infrastructure can be analyzed by risk type, magnitude, and possible mitigations.

The Jacobs team will take a similar approach to evaluate **future conditions**, holding geologic hazard and geographic asset areas constant, and repeating the desktop evaluation of future infrastructure locations such as roads, rails, and utility alignments and the future river channel, or the pre-dam river channel alignment.

Task 9: Geological and Geographic Challenges – Existing (slope failure and bank destabilization) | Deliverables: *Geologic and Geographic Challenges Report*

The Jacobs team will deliver this task concurrently with Task 7, following the same three-step approach described above, to provide the slope assessment and describe how the impacts would be mitigated, the expected costs including operation and maintenance. In general, changing from reservoir conditions to river conditions should increase slope stability. Slope failure is typically caused four factors, each of which can be mitigated:

- *Rapid reservoir drawdown* – Slow drawdown rate to drain banks
- *Erosion of exposed slopes* – Revegetation
- *Infrastructure scour* – Countermeasures at bridge footings and utility crossings
- *Erosion at slope toes* – Riverbank stabilization

Information will be used to refine the planning level cost estimates developed in Tasks 4 through 7.

Task 13-2: Community Engagement Phase 2 | Deliverables: *Updated stakeholder database, Online Open House, events in Public Engagement Plan, Phase 2 Engagement Summary*

Jacobs and PRR will engage communities to integrate feedback on key topics including:

- Understanding infrastructure strategies, mitigation and costs
- Addressing future transportation needs

Engagement tools include presentations and small group meetings, agency coordination, intercept conversations at common gathering places; freight shipper and carrier meetings; online open house and survey, and social media delivery. Tribal coordination will be a key audience given the evaluation of geographic and geologic changes in lowering the dam.

PHASE 3: EVALUATE IMPACTS

In this Phase the Jacobs team will evaluate other impacts to the transportation system. This information will complement the challenges and solutions developed in Phases 1 and 2 by providing a fuller picture. The team may also use the information to further refine solutions and evaluation results.

Task 8: Regulatory Challenges | Deliverable: *Regulatory Challenges Report*

The removal of the Lower Snake River Dams is set in a complex regulatory setting. The project is being considered in response to Tribal Treaties and Federal Endangered Species Act requirements. However, many agencies have a stake in this highly political and controversial project including USACE, energy producers, federal regulators, and state and local infrastructure providers. Work has already progressed in the planning process such as the Final Environmental Impact Statement and Record of Decision. Jacobs will consider other **federal requirements** such as Rivers and Harbors Act Permit, FERC License Surrender or Non-power License Approval, and Federal Consultations (Endangered Species Act Section 7 Consultation, Magnuson Stevenson Act Consultation, National Historic Preservation Act Compliance).

Jacobs will consider **state certifications** like the Clean Water Act Section 404 Dredge and Fill Permit, Waterway Development Permits, Dam Safety Permits, State Environmental Policy Act Review and Historic Preservation Review. Other strategy-specific considerations include but are not limited to:

- Some barge customers may not have good access to a mainline. If roads need to be widened, there could be environmental impacts that would require **SEPA review**.
- If WSDOT anticipates heavy use of USACE resources, it may want to consider a **Section 214 agreement**, which would allow the state to help fund USACE reviews, which can shorten timelines.

- If **bridges** need to be rebuilt over navigable waterways, the U.S. Coast Guard would review and approve changes.
- WSDOT must coordinate with the Surface Transportation Board (STB) for new rail lines, though an industry spur does not require STB approval. STB uses NEPA process to make decisions.
- Jacobs will consider how commercial trucking emissions standards, hours of service (HOS), and special permits may impact the solutions and possible mitigations.

Task 11. Commodity Impacts | *Deliverable: Freight Commodity Impacts Report*

Losing river shipping is likely to increase shipping costs for all types of goods. The existing truck or rail capacity may not be able to fully absorb the cargo. CPCS will lead a study detailing the commodity impacts from increased transportation costs, the existing and potential future unit cost of each commodity type from the USDA Economic Research Service, and potential mitigation strategies to limit cost (e.g., long-term contract with shipping companies). Our research will be supplemented with industry consultation like rate quotes and transportation capacity case studies to analyze financial impacts on shippers by mode.

Task 12. Reduced Competition | *Deliverable: Reduced Competition Impacts Report*

We will research the economic competitiveness impacts on Washington's agricultural industry due to goods movement shift to rail and truck, and opportunities to mitigate reduced competition. The Jacobs team will evaluate the effects of modal shifts on supply chains, including export facilities and ports on the Lower Columbia River. For example, there may be opportunities to preserve the State's competitive edge by providing sales tax abatements on equipment, streamlining regulations and permitting, or promoting EV trucks to lower operating cost. The Jacobs team will provide a benefit cost analysis summarizing the

overall benefits and costs associated with shifting roughly 25 million tons of goods to rail and barge.

Task 13-3: Community Engagement Phase 3 | *Deliverables: Updated stakeholder database, Online Open House, events in Public Engagement Plan, Phase 2 Engagement Summary*

Jacobs and PRR will engage communities to integrate feedback on key topics including:

- State and regional economic impacts and benefit-cost tradeoffs
- Public resources to support solutions and mitigate impacts

Expected engagement tools include presentations and small group meetings, agency coordination; freight shipper and carrier meetings online open house, and social media messaging.

PHASE 4: CONCLUSION

The Jacobs team will work closely with WSDOT in this Phase to prepare a final report, develop and deliver project key messages, present information to the legislature, and pave the way for WSDOT's continued engagement with communities and coordinating agencies.

Task 14: Interim and Final Reports

The Jacobs team will develop Interim and Final Reports to the Legislature and other key audiences. We have delivered similar reports to WSDOT, including the WSF Origin and Destination Study, the SR 503 Corridor Plan, the US 2 Westbound Trestle Status Report, and progress reports for the Construction Program Business Plan. The Reports will include project purpose, major findings, community engagement summaries, evaluation methods and results, and next steps. The Jacobs team will bring the Jacobs' teams' deep expertise into a graphic-rich, accurate and clear presentation of the transportation costs, benefits and future infrastructure needs.

We expect to publish the Interim Report in Phase 1 covering transportation needs, engagement findings, and potential solutions. The Final Report will summarize major findings in a top-level report, with all prior final reports included as appendices.

How Work Plan Will Address Contingencies

Jacobs' project teams adapt project delivery approaches with flexible project delivery and community engagement, even with changing office and project environments. We commit our focus to on-time delivery, accurate and innovative technical analysis, and meaningful communication with project stakeholders. At the same time our project management teams are equipped to plan for and address contingencies.

- Jacobs' projects start with client expectation surveys, to intentionally capture the project outcomes and what success will mean for WSDOT. The information can be used to guide project contingency decisions, ensuring project goals are linked directly to resource assignments.
- Jacobs has a robust project management system used on all projects to plan for contingencies and monitor progress against project work plans. This may involve contingency tasks agreed to by clients, with a flexible work order approach in which clients request specific deliverables as needed and up to a specified budget.
- The Jacobs project manager will ensure project schedules meet milestones while creating space for the project team to identify risks to project goals and outcomes at start, monitor risks and changing conditions or results, and identify and enact contingency plans in partnership with the WSDOT team.

B. APPROACH TO RESOLVING ISSUES WITH THE PROJECT TEAM, CLIENT(S), AND STAKEHOLDERS

We structured our team to provide clear and consistent direction to project staff so that issues can be successfully resolved at all appropriate levels and at the earliest time. Jacobs will establish clear lines of communication to resolve issues quickly and consistently throughout the project. We can address many issues in an expedited fashion by giving the project the correct attention and monitoring for risk management and mitigation. If needed, Jacobs senior leadership can support, bringing over 20 years history of working alongside WSDOT on complex issues.

Our project-level approach follows these fundamental steps:

- **Identify the issue** or concern. In most cases, an issue or concern may be obvious. In other cases, it may be a more underlying issue, requiring some level of analysis or assessment to fully understand the problem.
- **Communicate the issue** with impacted parties or specific individuals (if of a more sensitive nature). This step allows people to be aware of project effects and assure them it is being addressed.
- **Determine a resolution.** Depending on the magnitude or severity of the issue, a resolution may be as simple as a focused conversation with the impacted parties and consensus on the proposed resolution. If the issue is more significant, we may need a more defined approach and timelines.
- **Engage with stakeholders** to communicate about the situation and the steps we are taking to address it. Following the guidance under the workplan, it will be important to keep stakeholders informed and to manage their expectations.
- **Monitor progress** of the resolution and, if needed, make additional adjustments to the corrective action until we achieve successful resolution.

C. KEY ISSUES AND CRITICAL MILESTONES FOR THE PROJECT

Key issues

We have identified several examples of key issues and risks for the project, **presented in the table below**, and how we will bring resolution to these issues.

KEY ISSUES	
Issue	Resolution
Meaningful and trusted community engagement	<ul style="list-style-type: none"> The Jacobs team will identify key relationships, messages and engagement opportunities through the Public Engagement plan, with opportunities to regularly calibrate the work approach. We will communicate with clear messages that range in complexity and detail to meet audiences where they are.
Balancing public information needs with private business interests and competition	<ul style="list-style-type: none"> Openly offer expertise and best practices to stakeholders interested in state of the practice information about opportunities. Our teams understand businesses can't share everything, but we can get information to make and vet reasonable estimates to inform communities, partners and business stakeholders.
Dependable data and analysis	<ul style="list-style-type: none"> We will build on known "tried and true" data sources and offer innovative big data analytics to break out further detail and offer up-to-date sources. Our team will be transparent communicating about data sources and analysis work plan so that reviewers have full understanding of the approach and can support results accurately reflect the methods.
Knowledge of intermodal freight networks, facilities and operations	<ul style="list-style-type: none"> Jacobs and its trusted partners CPCS to offer WSDOT the expertise needed to fully investigate and communicate the transportation impacts of the dam removal. We will integrate planning and community engagement to access industry stakeholders to inform and vet freight needs, infrastructure strategies and economic impacts.
Capturing complex economic relationships and dependencies	<ul style="list-style-type: none"> Jacobs, CPCS and Green Economics have supported freight and shipping projects around the world. This first-hand knowledge will temper data analysis to ensure teams are viewing relevant data and asking industry representatives questions that uncover far-reaching interdependencies.
Comprehensive dam removal requirements	<ul style="list-style-type: none"> Jacobs is a world leader in major dam removal projects with teams currently serving clients in the NW. The first-hand knowledge helps ensure we fully consider near- and long-term effects.
Understanding cultural, historical and natural environment assets	<ul style="list-style-type: none"> Jacobs environmental planning teams lead NEPA analyses for some of the most complex infrastructure projects like West Seattle Ballard Link Extension and the SR 520 Pontoon Construction. We will emphasize a complementary quantitative and qualitative work plan to clearly present resources, risks and solutions.

Critical milestones

We have provided an overview of this study's critical milestones below.

Project Work Plan and Community Engagement Plan: Sets the stage to successfully meet WSDOT goals and outcomes, clearing the way for effective communication, innovative and critical thinking, accurate results, and meeting subsequent milestones.

Phase 1 Draft and Final Reports and Community Engagement: Phase 1 is designed to let the project team and communities understand the needs and conditions within which the fuller study takes place. Getting the analysis right will lead to meaningful engagement, build stakeholder trust, and provide new insights to transportation and freight in the region.

Interim Report: The Interim Report is due to the Legislature about 1 year into the project. This is a key milestone in generating support and buy-in for the project. It will be an anchor in a community engagement process to learn what people see as priorities and needs related to freight and the study itself.

Phase 2 Draft and Final Reports and Community Engagement: In Phase 2 the Jacobs team will investigate what it will take to create a sustainable, efficient, and safe freight transportation network to, from, and through the Lower Snake River region. Completing these investigations, evaluations and engagement events will be a major milestone in which WSDOT and community partners will know they've dug deep to explore all opportunities, costs and risk.

Phase 3 Draft and Final Reports and Community Engagement: In Phase 3 the Jacobs team will assess factors related to and informing infrastructure strategies, with implications for long term and far-reaching economic ties to Snake River transportation. This Phase milestone holds some of the last project opportunities to engage communities and agency partners, setting a critical stage for further progress, decision-making and engagement.

Final Report: The Final Report is a clear milestone in any project, summarizing the combined efforts of years of work and presenting the full library of project information and analysis for local communities, public agencies, businesses, and elected officials. It's less a closing chapter for the Snake River Dams, and more a starting point for subsequent processes in continually improving community health, safety and welfare.