

Fish Passage Program Cost Management Recommendations



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Opening Letter

Dear Governor and Transportation Committee Members:

As directed by **Engrossed Substitute House Bill (ESHB) 2134, Sec. 214 (8)**, the Washington State Department of Transportation (WSDOT) is submitting the **Fish Passage Program Cost Management Recommendations Legislative Report** that states:

“To assist the department as it continues to make progress on meeting the requirements of the federal U.S. v. Washington court injunction and to address estimated programmatic cost increases, within the funding provided in this section, the department shall analyze contracting methods, alternative bundling concepts, and other options to manage costs. The department shall provide a report outlining recommendations to the governor and transportation committees of the legislature by December 15, 2024.”

Over the past decade, WSDOT has achieved numerous milestones within our Fish Passage Program. In recent years, increased funding levels have enabled us to build our delivery “machine,” essential for the design and execution of a significant number of fish barrier correction contracts, as mandated by the 2013 federal injunction requiring the State of Washington to provide and maintain fish passage for salmon under state-owned roads. This undertaking is unprecedented in scale—no other agency in the nation has been tasked with a comparable mission. Although we have faced challenges in delivering this program, we take immense pride in our accomplishments and remain committed to continual improvement and the application of lessons learned. WSDOT continually strives to improve processes and manage the cost of projects within our control while meeting court-ordered deadlines.

Despite our progress, it is imperative to acknowledge that additional resources are needed. An estimated \$5 billion in additional funding is needed to achieve a 90% habitat gain, as well as to address newly identified barriers and failing culverts. WSDOT has consistently communicated funding needs to meet the state’s obligations under the federal injunction, and we will continue to advocate for the necessary resources.

In this report, we take the opportunity to highlight several elements of continuous improvement that we have successfully integrated into the program. Additionally, we outline future cost management strategies that we intend to implement while also identifying key areas in which we seek legislative support to ensure the program’s success.

Sincerely,

Kim Rydholm, P.E.
Fish Passage Delivery Manager

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List of Abbreviations

DB	Design-Build
DBB	Design-Bid-Build
ESA	Endangered Species Act
ESHB	Engrossed Substitute House Bill
GCCM	General Contractor/Construction Manager
HPA	Hydraulic Project Approvals
IWWW	In-water work window
MOT	Maintenance of traffic
PDB	Progressive Design-Build
PDMSG	Project Delivery Method Selection Guide
ROW	Right of Way
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

Executive Summary

Introduction

Since 1991, WSDOT has been correcting fish barriers and has worked to restore healthy waterways by removing or correcting barriers that prevent salmon and steelhead from freely migrating, feeding, and reproducing. WSDOT has intensified its fish passage efforts, as funded by the Legislature, in western Washington in response to a federal injunction issued in 2013.

The Fish Passage Program is unique in complexity and scope. With a court-ordered deadline, projects spread across hundreds of geographically diverse sites, and an ever-expanding inventory of barriers, the program requires immediate and targeted project metrics and the ability to adapt quickly to keep projects on track, adhere to budgets and timelines, and make efficient use of resources. The federal injunction requirements address the following:

- **2013 List of Significant Gain Barriers (>200 meters of upstream habitat)**
 - Open 90% blocked habitat by 2030
 - Open remaining 10% deferred habitat at the end of the structure's useful life or as part of another project
- **2013 List Limited Gain Barriers (<200 meters of upstream habitat)**
 - Correct at the end of the structure's useful life or as part of another project
- **Newly Identified Barriers** - those identified after the 2013 List was developed

Despite challenges, the program is making substantial progress. As of June 2024, WSDOT has successfully corrected 146 injunction barriers, improving access to 571 miles of potential habitat, which is 50% of the total blocked habitat of significant gain barriers in the injunction area. However, additional funding is needed to achieve the federal injunction's requirement of opening 90% of potential habitat by 2030.

This legislative report outlines the unique cost management challenges and strategies the program is using to address them, along with forward-looking recommendations, as directed by **ESHB 2134, Sec. 214 (8)**.

Cost Management Implications

WSDOT faces substantial external factors that influence cost management. Two key implications include:

- **Inventory Control:** WSDOT is required to continually assess state-owned infrastructure to identify **newly identified fish passage barriers**. Since 2013, 216 newly identified barriers have been added to the injunction list, increasing overall program costs. **Unplanned emergency culvert replacements** due to structural failures require the program's immediate attention and funding for replacement. As the highway system continues to age, so too will its associated culverts, resulting in an accelerated failure rate. Finally, **several fish passage barriers are included for removal as part of larger projects** and timing of project funding may be delayed beyond injunction deadlines. This requires the program to find and fund alternative habitat gain solutions that can be completed within the injunction deadlines,

increasing overall program costs.

- **Construction Cost Inflation and Industry Market Saturation.** Considerable cost inflation, driven by rising material, fuel, and labor prices, labor shortages, constrained injunction schedule, and increased demand for infrastructure projects, has strained qualified contractor and design engineer availability and steadily increased construction costs. These factors make it challenging to manage budgets and secure affordable bids for new projects.

Current Program Management Strategies

To help expedite delivery of the fish passage program, WSDOT has increased its use of alternative project delivery methods, particularly Design-Build (DB) and Progressive Design-Build (PDB). These methods leverage efficiencies by enabling contractors to collaborate with designers early on, especially when addressing complex crossings. By doing so, WSDOT can reduce the amount of pre-contract design work needed before executing contracts, with the goal of accelerating overall project delivery, though it does not directly reduce program costs.

However, by integrating lessons learned and adopting cutting-edge best practices, the program has continuously improved delivery schedules while delivering value. Key cost management strategies include:

- **Bundling Sites Into Single Contracts:** To accelerate delivery and efficiently utilize industry design and construction resources, barrier sites are strategically bundled into larger contracts to streamline traffic management needs, spark competition among a wider range of contractors, and enhance design and construction efficiency.
- **Strategies identified through a culture of continuous improvement:** The program rapidly applies lessons learned and process improvements to control costs and enhance efficiency, including a suite of strategies categorized as follows:
 - **Framework improvements:** Centralize key decisions and provide consistency.
 - **Process improvements:** Change and improve how the program operates.
 - **Resource improvements:** Offers tools for streamlining overall and project-level delivery.

Recommended Cost Management Strategies

WSDOT is pursuing the following cost management strategies to address the growing fish passage barrier inventory and the saturated construction market to provide better cost management:

- **Enhanced Centralized Program Controls:** Strengthen oversight and monitoring processes across the entire program to provide immediate, targeted data that will inform programmatic management and budget decisions, resulting in better cost management and efficiency.
- **Balanced, Market-Sensitive Delivery Methods:** Adopt flexible project delivery methods that respond to changing market conditions, ensuring timely and cost-effective execution.
- **Innovative Traffic Management Approaches:** Implement creative solutions for managing traffic impacts to minimize costs as well as duration of impacts to the public. Gain support from the Legislature for more aggressive traffic control plans.
- **Maximize the Time for In-Water Work:** Continue to work with co-managers (Washington Department of Fish and Wildlife [WDFW] and tribes) on increasing the amount of work that can occur in the water while protecting fish life.

Introduction

Improving Fish Passage to Help Keep Waterways Healthy

State highways intersect rivers and streams at thousands of points across Washington, and some of these crossings impede critical fish migration. Most culverts were installed decades before the needs of fish were fully understood. WSDOT established a fish passage program in the 1990s to restore healthy waterways by correcting barriers that prevent salmon and steelhead from freely migrating, feeding, and reproducing. The fish-friendly structures WSDOT constructs now are larger, more resilient to changes in the landscape and provide fish passage long into the future.

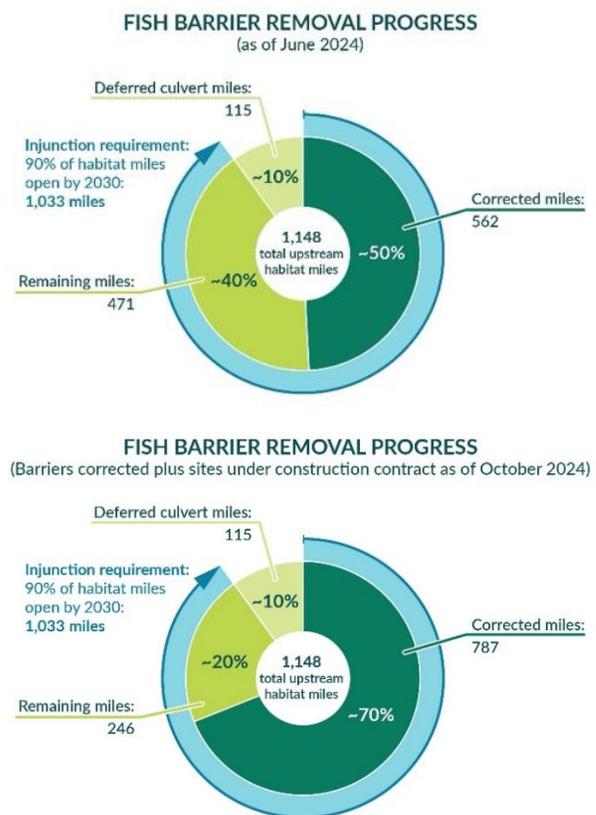
In response to a federal injunction issued in 2013, WSDOT has intensified its efforts in western Washington, where the injunction requires the state to accelerate the removal of state-owned culverts blocking vital fish habitats to meet court-ordered timelines. As of June 2024, WSDOT's program has successfully corrected 146 injunctions. However, additional funding is essential to achieve the federal injunction's requirement of opening 90% of potential habitat by 2030.

Salmon and steelhead recovery is important to healthy ecosystems and Washington's economy by:

- Providing an important food source for over 100 wildlife species, including orcas.
- Contributing to Washington's economy through recreational and commercial fishing.
- Supporting an estimated 16,000 jobs and over \$500 million in personal income.
- Creating jobs and benefiting local economies through habitat restoration work.
- Having cultural importance to the many tribes who rely on salmon and steelhead as a food source. Washington state must uphold treaty-reserved fishing rights, ensuring that salmon are present and available for harvest.

The program is unlike any other transportation infrastructure project in its complexity and scope. With a court-ordered deadline, projects spread across hundreds of geographically diverse sites, and an ever-expanding inventory of barriers, this work requires flexibility and rapid responsiveness to changing conditions. The program needs immediate and targeted project metrics from the regions and the ability to adapt quickly to provide guidance, help projects remain on track, adhere to budgets and timelines, and make efficient use of resources.

Figure 1. Graphics Illustrating Program Progress



WSDOT has successfully removed hundreds of barriers, and results from post-project spawner surveys conducted by WDFW show that over half of the recent projects indicate fish spawning upstream of barrier corrections. Although it may take years for fish to fully utilize new habitats, particularly when populations are low, or other barriers exist, these early results are promising. WSDOT barriers are often the most expensive barriers in a system and correcting them allows for the less expensive barriers owned by others to take advantage of various grant opportunities. By maintaining strong partnerships with agencies, tribes, and local communities, WSDOT remains committed to restoring Washington's watersheds and creating sustainable habitats for salmon and steelhead for long-term ecological recovery. WSDOT continues to seek efficiencies across the program while facing construction industry saturation, cost inflation, and workforce shortages. This legislative report outlines the unique cost management challenges and strategies the program is using to address them, along with forward-looking recommendations, as directed by **ESHB 2134, Sec. 214 (8)**.

Cost Management Influences and Current Strategies

Cost Management Influences

As WSDOT navigates the complexities of the program and the number of sites requiring correction in a short period of time to meet the requirements of the injunction, it faces substantial external factors that influence cost management. Key factors are detailed below.

- **Inventory Control:**
 - **Growing barrier inventory:** WSDOT is required to continually assess state-owned infrastructure to identify newly identified fish passage barriers. This ongoing inventory process regularly reveals additional barriers that must be added to the injunction culvert list, thereby increasing the overall program cost of correcting all injunction barriers. Since 2013, 216 newly identified barriers have been added to the injunction list. These barriers need to be corrected “within a reasonable period of time” according to the injunction, which is not defined in the injunction. This is in addition to the requirement to open 90% of blocked habitat of significant gain barriers on the original 2013 injunction list. The current delivery plan includes 75 newly identified barriers. The program does not plan to add any additional newly identified barriers to the plan until the current delivery plan is completed. However, selecting each of the newly identified barriers was a careful balancing act. In many instances, addressing these barriers now is not only more efficient but will also result in substantial cost savings over time. These 75 barriers were added due to the following:
 - Being within a larger transportation project that requires correction.
 - The newly identified barrier is part of a stream system that includes an original barrier.
 - A 2013 list barrier in the delivery plan is in close proximity to a newly identified barrier, and it is most efficient to correct them simultaneously.
 - The newly identified barrier is structurally failing and needs to be replaced.
 - The newly identified barrier has high habitat gain.
 - **Emergency culvert replacements due to structural failures (unplanned inventory):** Unplanned emergency culvert replacements due to structural failures require the program’s immediate attention for replacement. The injunction and state law require these culverts to be replaced with a fish-passable structure. Typically, this is required to occur within five years of failure. When an injunction culvert not currently planned for replacement fails, the funding used to replace the failed culvert comes from the program. These emergency replacements are generally low in habitat gain and contribute little to meeting the injunction requirements while also reducing the funds available for the planned culvert replacements. As the highway system continues to age, so too will its associated culverts, resulting in an accelerated failure rate.
 - **Changes in large transportation projects:** Fish passage barriers included in project scopes of large transportation projects are programmed with funding from those projects for replacement. However, shifts in project funding can lead to delaying the larger project beyond

the 2030 injunction deadline, which in turn requires the program to find and fund alternative habitat gain solutions. This often results in multiple barriers needing replacement to make up for the lost habitat from the delayed replacements, increasing overall program costs.

- **Construction cost inflation and market saturation.** The national and regional construction industry, as well as consultant design engineers with the necessary experience for fish passage projects, have experienced considerable cost inflation, driven by rising material, fuel, and labor prices, labor shortages, and increased demand for infrastructure projects. In Washington, particularly in the Puget Sound area, these factors have been exacerbated by the number of large-scale transportation projects by multiple owners. The result has been a strain on qualified contractor and design engineer availability and a steady increase in construction and design costs, making it more challenging for public agencies to manage budgets and secure affordable bids for new projects that meet planning-level cost estimates.
- **Constrained Work Periods.** To minimize impacts on migrating fish, construction occurs within the Ordinary High Water Mark within an in-water work window (IWWW), which can be limited to only a few weeks every year. The window is a calendar period established by WDFW where work is permitted in a stream. Projects with an in-water construction duration beyond the IWWW may need to spread work over multiple years, committing contractor resources and increased costs to cover the project duration.
- **Loss of Momentum.** Due to long-term funding challenges, the program has entered a slowdown phase, pausing a large number of sites in both design and construction. Pauses in the planning, design, and construction phases drive up costs, disrupt WSDOT staffing and labor continuity, complicate contractor scheduling, and result in missed in-water work windows, hindering efficient project delivery. Steady and predictable funding will help manage costs.

Current Program Management Strategies

Since the program's inception, WSDOT has strongly focused on delivering injunction-defined scopes and its requirement of restoring access to 90% of the blocked habitat of significant gain fish barriers by 2030. With hundreds of completed fish passage sites, WSDOT has emerged as a leader in this field. The program has continuously improved delivery schedules by integrating lessons learned and adopting cutting-edge best practices. These evolving strategies are essential to meet the injunction deadline while delivering value. Key program and cost management strategies include:

Bundling Sites Into Single Contracts

To accelerate delivery, utilize industry design and construction resources efficiently, while also maintaining a watchful eye on the effects of the quantity of project site bundles and subsequent impacts on a market already saturated with work, barrier sites are strategically bundled into larger contracts to balance the workload of the region's qualified and available contractors and design engineers. The program continues to refine this approach, leveraging best practices and insights gained. Key bundling strategies include:

- Grouping sites along the same roadway for streamlined traffic management, reducing disruptions through coordinated lane closures, detours, and traffic shifts.
- Varying bundle sizes to spark competition among a wider range of contractors of all sizes.

- Combining sites with similar scopes to enhance design and construction efficiency.

Alternative Project Delivery Methods

In addition to bundling barriers, WSDOT has increased its use of alternative project delivery methods, particularly DB and PDB contracts, with the goal of accelerating delivery. These methods leverage efficiencies by enabling contractors to collaborate with designers early on, especially when addressing complex crossings. By doing so, WSDOT can reduce the amount of pre-contract design work needed before executing contracts. A targeted, selective approach using alternative project delivery methods offers several key benefits:

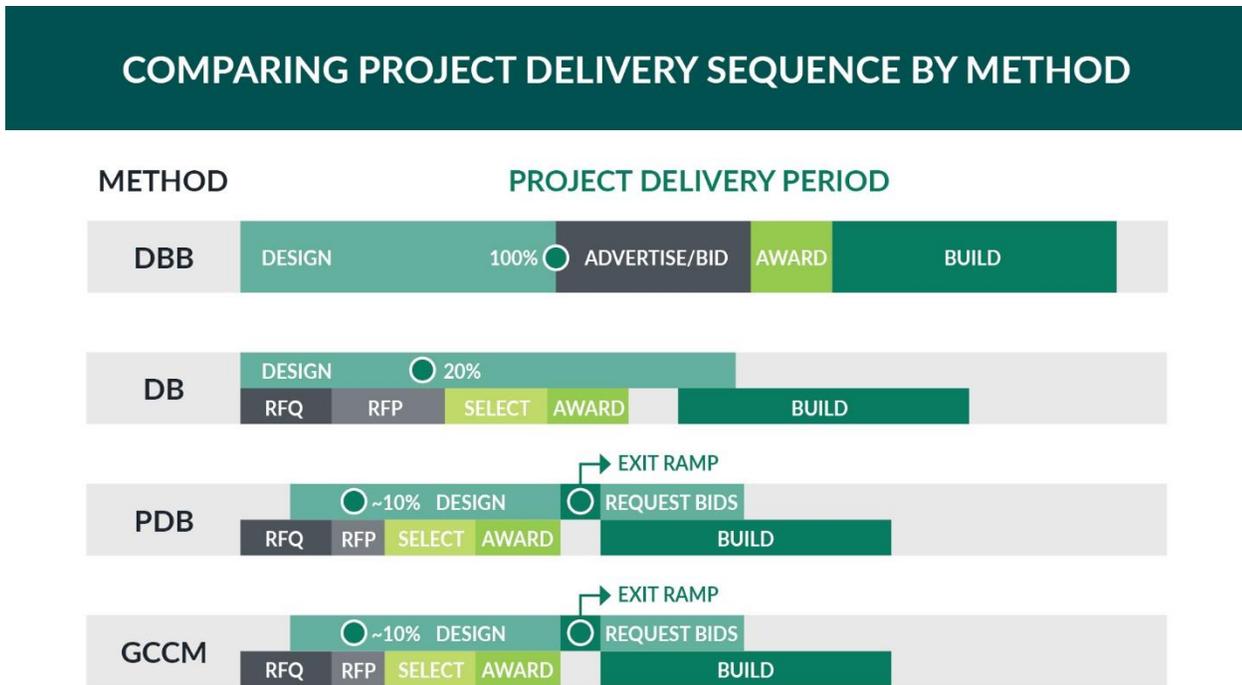
- Greater control over detailed design (specific to PDB)
- Accelerated project timelines to help meet the injunction deadline
- Early certainty on costs and schedules (specific to DB)
- Reduces WSDOT's workforce demands associated with project design and construction oversight
- Improved quality of work since firms are selected based on their qualifications and technical expertise rather than the lowest bid
- Encouragement of technical innovation

Currently, the use of the PDB method requires review and approval from the Capital Projects Advisory Review Board. Potential future legislation may alleviate this requirement thus allowing WSDOT to utilize PDB in the same manner as is currently done for DB contracts. This change would streamline the procurement process when PDB is the preferred delivery method.

PDB is a relatively new delivery method for WSDOT and is well-suited for large-scale fish passage projects. It allows the agency to expedite both design and construction phases. Involving the builder early in the design process brings advantages, including collaboration with co-managers and optimizing the final crossing design. However, this model demands higher-level expertise in contract administration and price negotiation. While the pool of contractors experienced with PDB is currently limited, the contracting industry has shown interest due to the reduced level of risk assigned to the contractor compared to other methods, such as DB.

An alternative delivery method not currently utilized by WSDOT is General Contractor/Construction Manager (GCCM). This delivery method requires WSDOT to enter into concurrent but separate contracts with a design firm and a General Contractor. Under this delivery method, the Designer and the General Contractor are contractually obligated to work together during the preconstruction and design phases. At that point, WSDOT will negotiate with the General Contractor to establish a price for the project's construction. WSDOT has limited experience with GCCM as a delivery method, using it one time on the Coleman Dock Ferry Terminal project. WSDOT has found it more efficient to allow designers and contractors to partner on their own accord and have the design builder be responsible to WSDOT for project delivery. Similar to PDB, GCCM requires higher-level expertise in contract administration and price negotiation. At this time, any inclusion of GCCM as a WSDOT delivery method will require Capital Projects Advisory Review Board approval.

Figure 2. Comparing Project Delivery Sequence by Contract Delivery Method



DBB: [Design-Bid-Build] DB: [Design-Build] PDB: [Progressive Design-Build] GCCM: [General Contractor/Construction Manager]

Strategies Identified Through Culture of Continuous Improvement

WSDOT is committed to rapidly applying lessons learned and process improvements to control costs and enhance efficiency. Some changes affect entire programmatic frameworks and processes, while others improve efficiencies at a resource level. Regardless, the following strategies have helped reduce rework, optimize scheduling, and improve cost management across the program:

Framework improvements centralize key decisions and provide program consistency:

- **Fish Passage Strategy Team:** WSDOT developed a small team of highly experienced internal fish passage experts who make project and policy decisions across the program. This enables especially difficult decisions to come to resolution quickly and consistently.
- **Industry Task Force:** A team assembled of WSDOT and industry (consultant and contractor) fish passage delivery experts who brainstorm contracts and process improvements and recommend solutions to streamline delivery, reduce costs, and resolve challenges related to delivering DB fish passage projects.

Process improvements change and improve how the program operates:

- **Level of Complexity Pre-Scoping:** Adding a pre-scoping phase for high-risk disciplines (hydraulics, geotechnical, environmental permitting) improves early design assessments, leading to more accurate cost estimates and project planning. This is one of the most impactful changes to providing early schedule and cost certainties.
- **Program Estimates:** The initial planning-level cost estimates were improved by including more

detailed preliminary engineering and site-specific information. This shift in methodology is possible due to WSDOT's experience and knowledge and represents a paradigm shift in program estimating.

- **Independent Project Cost Estimating:** For PDB projects, an independent cost estimator is involved on behalf of WSDOT to assist in negotiating the best achievable price of the final construction contract.

Resource improvements offer tools for streamlining program and project-level delivery:

- **Fish Passage-focused Policies:** Standardizes delivery approaches leading to greater efficiency. Recent policies have addressed stream scour and large woody material in and around structures. These policies provide standardization and project scope certainty.
- **Right-Sized Implementation:** Scopes for fish passage projects include only what is needed to provide fish passage in accordance with the injunction. Additional project needs (e.g., stream restoration, wildlife crossings, stormwater retrofits, complete streets) are carefully evaluated on a project-by-project basis.
- **Virtual Site Visits:** A review of proposed project designs often requires WSDOT staff and co-managers to visit project sites. The volume of site visits can be both costly and time-consuming. By utilizing 360-degree photo imaging to create virtual site tours, project staff and co-managers can virtually collaborate, resulting in higher project review efficiency and lower costs for site visits.
- **WSDOT Hydraulic Manual:** Regularly updated to reflect lessons learned into stream crossing designs, leveraging WSDOT's expertise to reduce redesigns and avoid cost escalations.
- **Buried Structure Standard Plans:** Streamlines the design process for "box culvert" structures up to 30 feet, reducing design time, costs, and procurement timelines.
- **Multi-Agency Permit Program:** WSDOT continuously improves and streamlines environmental decision-making and permitting. Consistent with [RCW 47.85.020](#), WSDOT implements and improves a Multi-Agency Permit Program to streamline permitting by simplifying permit application processes, reducing paperwork, and reducing the time it takes to acquire these environmental permits and approvals.

Cost Management Recommendations

In the spirit of continuous improvement, WSDOT recommends the cost management strategies outlined below to address the growing fish passage barrier inventory and the saturated construction market to provide better program cost management. WSDOT will implement these cost control measures within the program's resources, which will depend on overall program funding.

- **Enhanced Centralized Program Controls:** WSDOT plans to strengthen oversight and monitoring processes across the entire program to provide immediate, targeted data that will inform programmatic management and budget decisions, resulting in better cost management and efficiency.
- **Balanced, Market-Sensitive Delivery Methods:** WSDOT will adopt flexible project delivery methods that respond to changing market conditions, ensuring timely and cost-effective execution.
- **Innovative Management of Traffic Approaches:** WSDOT would like to implement creative solutions outlined below for managing traffic impacts to minimize costs as well as duration of impacts to the public and gain legislative support for this.
- **Expand Time Period for In-water Work:** WSDOT will continue discussions with WDFW around policy changes needed to allow temporary bypass crossings outside of the IWWW during winter months and explore expanding IWWWs while protecting fish life.

Enhanced Centralized Program Controls

WSDOT will transition the program to enhanced and required centralized controls to improve monitoring and management of the growing fish passage barrier inventory, optimize funding, and streamline project delivery. Key strategies include:

- **Cohesive Oversight and Consistent Standards:** Uniform tools and procedures across regions will provide consistency in planning, design, procurement, project management, and reporting.
- **Real-Time Data and Feedback:** At a frequency more expedient than WSDOT's current standards for project delivery, receive and provide program-specific standardized reporting and feedback mechanisms to manage schedule progress and budget, understand what is working and what needs adjustment, and allow for quick pivots where necessary.
- **Centralized Budget and Resource Management:** By controlling and managing the overall budget, the program can reallocate resources, including staff and funds, across projects and regions based on need, ensuring an efficient use of funds. This is a value proposition to maintain the current projects' schedule and budget while allowing flexibility during the recurring re-baselining of program inventory. Identifying budget limitations and critical schedule constraints early is essential for adapting the program's strategy. By proactively addressing these challenges, the program can make informed adjustments that keep the schedule on track while most efficiently using resources. This approach allows for flexibility in navigating necessary changes while minimizing the risk of delays or cost overruns.

When the program first began, there was no existing WSDOT model designed to manage a large, complex delivery program spanning multiple regions and hundreds of barriers. As a result, the program adopted WSDOT's well-established regional delivery model—effective for traditional safety, mobility, and

preservation projects—where regional offices are responsible for individual projects and budgets while the program management team provides oversight and monitors the budget and overall progress.

While this approach has allowed WSDOT to make significant progress, the nature and scale of the program, combined with the complexity of managing hundreds of sites under an injunction-mandated deadline and continuous growth in barrier inventory, can benefit from a more integrated approach. Adopting procedures and protocols like those used in a program management office model would provide the program with enhanced program controls, more consistent oversight, and better alignment of resources, allowing WSDOT to improve cost management and respond quickly to evolving conditions.

Transitioning to and implementing centralized controls will require the following actions:

- **Update Procedures:** Analyze the regional delivery model’s current scheduling, cost management, and quality control protocols to identify additional needs. Develop updated, mandated procedures and protocols.
- **Refine Standardized Cost Estimating Practices:** The Cost Risk Assessment and Cost Estimate Validation Process is a proven method used successfully on countless WSDOT projects. A refinement of the method is needed to tailor it to the unique nature of the overall program for more accurate cost estimates. This would include supplementing current practices with independent cost estimate services for complex and diverse projects estimated above \$25 million.

An emphasis will be placed on a contractor’s view of project cost estimating by looking at controlling factors impacting the program. Involving the appropriate subject matter experts in the estimating process is critical to understanding the impacts on the project cost that come from construction restrictions imposed by the in-water work window, the unique constructability considerations associated with efforts performed within constricted work zones and the injunction deadline that emphasizes the importance of getting projects under contract in a timely manner. If not considered and incorporated into the estimate, the contractor estimate can stray from the overall expected cost found by utilizing the standard WSDOT process. It is imperative to have an accurate engineering construction estimate to control the overall program costs and more effectively and efficiently deliver the program.

- **Simplify Fish Passage DB Procurement Processes and Criteria:** To address the diversity of fish passage projects, use standard fish passage-specific project goals for the DB procurement process to expedite the procurement process for contractors and WSDOT. This will increase the efficiency in developing contracts, the procurement process, and contract administration.
- **Implement Centralized Data Metrics and Reporting:** Define and implement precise data metrics that regions must report, providing clarity and consistency in what is measured and when.
- **Master Schedule Management:** Develop and maintain a baseline master program schedule, accepting real-time progress data from regional offices and adjusting the baseline monthly based on progress or delays. The master schedule will also allow strategically staggering DBB and DB advertisements to maximize competition and increase participation.
- **Proactive Decision-Making:** With a clear view of performance trends and emerging risks, the program will be empowered to make immediate decisions, reallocate resources, and rebaseline schedules as needed to stay on track as the fish barrier inventory grows. The shift can support the long-term sustainability and success of the program, enabling it to adapt to ongoing changes while

driving to the injunction **requirement** of opening 90% of potential habitat and ensuring continued habitat restoration progress beyond that milestone to meet the remaining requirements under the injunction.

Balanced, Market-Sensitive Delivery Methods

As previously discussed, the transportation construction market in Washington is saturated with work, particularly in the Puget Sound area, and is experiencing design and construction cost inflation. With limited consultant design engineer and contractor capacity, WSDOT faces high project bids, costs, and challenges in securing qualified bidders, as many firms are already committed to ongoing or upcoming major infrastructure projects.

To address this reality, WSDOT plans to use tools to offer a strategic balance of delivery methods that align with contractor and consultant design engineer availability and capacity, ensuring that projects are appropriately matched to the right size contractors. By doing so, the program can optimize resources and enhance overall project efficiency.

Balanced delivery of the program will involve two key components: 1) conducting a thorough market analysis and 2) implementing an updated Project Delivery Method Selection Guide (PDMSG) tailored to the program's unique complexities.

Industry and Workforce Market Analysis

A better understanding of the area's infrastructure market limits provides the information necessary to adjust to those capacities. To accomplish this, WSDOT plans to conduct a comprehensive market analysis of the transportation industry and workforce to align project packaging with a contractor and consultant design engineer capacity. This analysis will support competitive bidding and mitigate high costs in a market saturated by large-scale projects. Drawing on industry feedback and research, the analysis will evaluate labor market trends, cost inflation, contractor competition, regulatory and environmental constraints, other regional projects, contractor preference for delivery methods, and economic conditions.

A detailed market analysis is especially critical for the program, given contractor and design engineer demands in the Puget Sound area. With large projects like WSDOT Megaprograms and Sound Transit initiatives dominating the region, contractor and design engineer availability is limited, curbing their ability to take on additional work. By assessing contractors by size and specialty, WSDOT can strategically package projects to attract smaller or niche contractors, promoting more manageable and diverse bid opportunities.

Adopting a more tailored delivery approach informed by a market analysis will help the program maximize resources and keep the program progressing.

Project Delivery Method Selection Guide (PDMSG) Tailored to the Program

WSDOT is updating the PDMSG to create a section tailored specifically to the program and will use this update to inform bundling strategies and delivery methods. This will involve including factors such as in-

water work windows and the project procurement timeline into the decision matrix and appropriately weighting those factors to reflect the program's unique requirements.

The process will also involve adjusting the bundle size to increase bidder interest, qualification eligibility, and competition. This can result in better-suited decisions for project sites and bundles, ultimately fostering more competitive bids and improving risk management, enabling the program to manage associated costs.

Currently, the PDMSG only includes DB or DBB as delivery method outcomes for individual project sites or bundles. WSDOT is in the process of updating the PDMSG to include PDB as a delivery option. Updating the PDMSG to incorporate PDB alongside DB and DBB will provide a valuable tool for streamlining the selection of delivery methods. This update will also help identify project sites and bundles well-suited for PDB. Additionally, GCCM can be added to the PDMSG tool to allow for another delivery method should the key factors associated with the bundled sites within the project under assessment to determine if it is the best-suited delivery method.

Innovative Management of Traffic Approaches - Including Full Roadway Closures

Effective traffic management is a crucial element of any infrastructure project affecting roadways. The costs associated with planning, constructing, and removing temporary lanes and bridges to maintain existing traffic can become substantial. This work also increases driver and worker exposure in active construction zones. WSDOT recommends exploring and adopting strategic, innovative approaches to maintenance of traffic (MOT), such as shorter duration full road closures, to control costs and shorten project timelines while enhancing safety for the public and construction crews and staff.

The first step to implementing any major traffic control measures is to conduct a traffic model and study that includes the relative time increase for corridor users. This will also evaluate the overall cumulative impact on corridor users, comparing a shorter duration closure to a longer duration temporary roadway impact. Special attention must be given to traffic control measures that impact first responders, school and school bus access, neighboring businesses, freight that regularly passes through the vicinity, and the overall traveling public. The results of these studies will be shared through extensive public outreach. Sharing information allows roadway users to prepare in advance for impacts and refine plans as appropriate.

Traffic control measures to consider include:

- **Traffic Lane Reductions:** Look to reduce travel lanes during construction. An assessment would consider alternate routes and potential impacts on local businesses.
- **Single Lane Reversible Traffic:** While a bigger impact on the traveling public than reducing the number of traffic lanes, reducing roadway traffic down to a controlled single lane of traffic that can be reversed either through a temporary traffic light or an onsite flagger team can provide the contractor room needed to reduce time onsite. This approach would be most appropriate on smaller local roads with lower traffic counts.
- **Full Facility Closures:** While gaining public acceptance and support from project partners for full closures can be challenging, WSDOT will further evaluate this approach. Detailed communication,

targeted public outreach efforts, and support from the Legislature will play a critical role. Full closures during construction offer considerable benefits in terms of cost control, schedule reduction, and safety, including:

- **Community, Freight, and Business Impacts:** Although full closures are disruptive, these impacts can often be mitigated with shortened construction windows, robust public outreach efforts, and carefully planned detour routes.
- **Enhanced Safety for Workers and the Public:** Full closures reduce the need for construction crews to work near active traffic, greatly reducing the risk of accidents. Removing commuters from the work zone also enhances overall safety.
- **Avoiding Traffic Shifts:** Infrastructure projects often require multiple traffic shifts throughout construction. A full closure eliminates the need for frequent traffic realignments, improving traffic flow safety.
- **Reducing Right of Way Acquisition (ROW), Environmental Delays, and Utility Impacts:** Phased projects frequently rely on temporary detours that extend beyond WSDOT's ROW, requiring complex negotiations for additional right of way or construction easements. Full closures can avoid these delays and the environmental investigations that often accompany expanded project limits. These investigations can lead to additional environmental impacts, costly mitigation measures, and permitting delays, further impacting the project schedule. Additionally, temporary detours can impact and require relocation to adjacent utilities, while full closures can minimize these conflicts.
- **Cost and Schedule Efficiency:** While full closures may not be suitable for every project, they can offer cost and time savings compared to phased construction. The ability to complete projects more rapidly is critical, especially in meeting the deadline mandated by the federal injunction. Example projects that represent these savings in cost and schedule include:
 - **SR108 Skookum Creek and Unnamed Tributary to Skookum Creek:** Two sites within the overall project were initially planned using single lane closures requiring a detour and flagging throughout the summer and fall. After engaging local residents and businesses, a 14-day full roadway closure using a 40-minute one-way detour was determined to be the best time/impact trade-off with the community.
 - **SR96 North Creek:** This project was completed using an MOT plan that kept one traffic lane open in each direction for two weeks. A similar project utilizing a full closure was completed in four days at a third of the traffic control cost.
 - **SR516 Barnes Creek:** A full closure was needed for nine days. The alternative plan was to have partial closures, extending the duration of impacts to traffic to two months with significant cost increases.

By considering innovative MOT strategies, including full facility closures when appropriate, WSDOT can achieve greater cost, schedule, and safety efficiencies, ensuring more streamlined project delivery.

WSDOT requests that the Legislature support these innovative MOT strategies and help to educate constituents on the benefits.

Continue Discussions Regarding In-Water Work Requirements

Most of the program's construction activities within rivers or streams can only occur during what is called the "IWWW." WDFW determines this window as a condition of Hydraulic Project Approvals (HPA) (Hydraulic Code – WAC 220-660) and limits certain in-water work to periods of the year when spawning or incubating salmon species are least likely to be impacted.

Completing projects within a single IWWW requires a large commitment of resources, including construction personnel and equipment, within a very short period. This also increases impacts on the traveling public by necessitating larger work zones and traffic shifts during the summer months when traffic volumes are at their peak. Additionally, concentrating all in-water construction during these limited times adds strain on precast concrete manufacturers, who face high demand during the summer construction season. For these reasons, limited in-water work windows are among the drivers of higher contractor bids due to the associated risks and market factors. Ongoing discussions with WDFW to explore flexibilities to allow longer in-water work windows continue to clarify what may and may not be possible, as well as identify unintended risks. For example, in-water work windows are also a component of the Endangered Species Act (ESA) oversight by the National Marine Fisheries Service and the US Fish and Wildlife Service (Federal Services). Therefore, any discussions about longer in-water work windows must also consider the risk of additional scrutiny by the Federal Services, which could undermine intended schedule benefits through much longer ESA consultation processes.

It is important to note that WDFW cooperates with WSDOT and its contractors when adjustments to in-water work windows become necessary to accommodate unanticipated circumstances during project construction. The nature of the cost management recommendations discussed here involves investigating the possibilities of longer or more flexible in-water work windows as part of HPA conditions so that this information is known up-front and can be communicated to contractors as part of requests for proposals (i.e., when this information could potentially lower contractor bids).

A related consideration that would potentially reduce contractor bid prices is the ability to construct and utilize temporary bypass crossings outside of in-water work windows. Many existing crossings are small, and constructing a temporary fish-passable bypass designed to match the existing barrier's hydraulic and fish passage performance could allow for extended in-water work windows and require less complex and less disruptive excavations. This approach would also free up time before or after the end of the established in-water work windows to complete the permanent barrier correction. By allowing fish-passable bypasses in this more flexible manner, contractors can better plan staffing, manage traffic impacts, and coordinate supplier needs, improving overall project efficiency. This approach would also benefit fish by enabling the earlier removal of barriers.

Regardless of the limited possibilities and risks described in this section, WSDOT believes there is value in continuing to work with WDFW to explore and identify flexibilities for longer in-water work windows and temporary bypass crossings and to apply these flexibilities within HPA when possible and with due consideration to the underlying intent to protect aquatic species.

Conclusion

With additional funding, continuous integration of improvement strategies, and implementation of additional planned cost management strategies, WSDOT will continue advancing this complex and vital initiative, fulfilling the state's obligation to restore access to fish habitats.

If you have questions or seek additional information about the content of this report, please contact Kim Rydholm, Fish Passage Delivery Manager, at Kim.Rydholm@wsdot.wa.gov.