



The Seattle Multimodal Ferry Terminal at Colman Dock

## Project Management Strategies for Complex Projects: The Seattle Multimodal Ferry Terminal at Colman Dock Project

The Washington State Department of Transportation (WSDOT) is working with a diverse set of partners and stakeholders as it replaces and reconfigures the aging Seattle Multimodal Ferry Terminal at Colman Dock, all while the terminal remains operational. This multimodal ferry terminal is the largest in the system, providing two service routes to over 8.5 million people annually. The facility also serves two passenger-only routes operated by King County. Pedestrians and bicyclists, as well as several types of vehicles use the terminal, including cars, high occupancy vehicles, and transit.

To facilitate effective project planning and execution, WSDOT is using a product developed through the second Strategic Highway Research Program (SHRP2), called *Project Management Strategies for Complex Projects (R10)*. The product provides a systematic and collaborative approach that goes beyond traditional project management methods. It accelerates decision making, addresses complex issues, and expedites project delivery. The product has helped WSDOT assess the project and address complex issues such as public safety, environmental protection, and stakeholder impacts and concerns, from the planning stages through delivery.

Figure 1

### Project Snapshot: The Seattle Multimodal Ferry Terminal at Colman Dock Project

- Downtown Seattle ferry terminal with two routes (see map), providing trips across Puget Sound to Kitsap County and the Olympic Peninsula
- Rebuilt in 1964 while retaining many of the original 1938 timber piles, and expanded again in 1992
- Over 8.5 million riders, including 4.5 million foot passengers in 2013; ridership is projected to increase by 39% for the Seattle/Bainbridge route and 25% for the Seattle/Bremerton route by 2030
- Current condition is poor due to aging and seismically deficient timber piers
- \$268M project budget
- Key project features: replace main ferry terminal building and passenger-only ferry facility on southern edge of dock; replace and reconfigure portion of the dock to improve safety and operations for vehicles and pedestrian traffic; replace two movable bridges
- General Contractor/Construction Manager (GC/CM) project delivery method
- Six year anticipated construction period: 2017–2023



### The SHRP2 Solution: Project Management Strategies for Complex Projects

*Project Management Strategies for Complex Projects* was the tenth research project in the SHRP2 Renewal Focus Area and is also known as Renewal 10 (R10). The R10 product guides project teams through five dimensions of project management (5DPM): cost, schedule, technical requirements, finance, and context, expanding on the traditional three-dimensional process (cost, schedule, technical requirements). Using R10's planning methods and execution tools, WSDOT (1) quantified the level of complexity in each of the five dimensions of the Seattle Multimodal Ferry Terminal project, (2) applied the planning methods to the most complex areas, and (3) developed action plans and identified potential execution tools to address complexities.

A key benefit of this product is that project managers can apply it to highway projects of varying sizes and types. This characteristic allows project managers to proactively and effectively identify project complexities and develop action plans to determine rational resource allocations and guide project planning and implementation. Furthermore, the 5DPM process may be repeated periodically throughout the project lifecycle to continually monitor complexity and re-allocate resources as necessary.

## The R10 Washington State Demonstration Workshop

WSDOT's Colman Dock project team applied *Project Management Strategies for Complex Projects* during a demonstration workshop. The Federal Highway Administration (FHWA) hosted the workshop in order to:

- Showcase the product and provide assistance to WSDOT in applying the product's tools and methods.
- Facilitate project team communication and identify project complexities.
- Identify opportunities to implement complex project management strategies in the delivery of WSDOT's transportation program.

Through the R10 workshop, the WSDOT team learned to effectively identify and address issues earlier in the project's development, and determined to conduct a second project risk assessment including an evaluation of the context issues that could impact the project. The workshop also helped WSDOT better understand the complex stakeholder landscape by bringing to the table at an early stage representatives from FHWA, Federal Transit Administration (FTA), Washington State Ferries (WSF), and the design consultant.

### THE WSDOT WORKSHOP TIMELINE



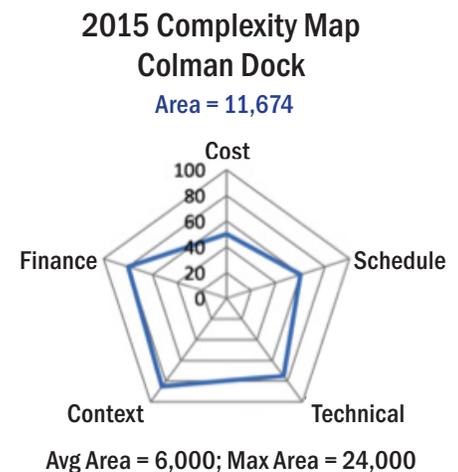
#### 1 Mapping the Project's Complexity

The Ferry Terminal at Colman Dock is a multimodal hub that serves and affects a variety of stakeholders. This is one of the factors that influences the success of this complex project. Using the R10 process, the WSDOT team identified other success factors within each of the **five dimensions of project management (5DPM)**: cost, schedule, technical, finance, and context. Then they quantified the level of complexity for each dimension on a scale of 0 to 100, with 100 representing the greatest possible complexity and 50 representing an average level. The team plotted each dimension's relative level of complexity on a pentagon-shaped graph that provided an overall complexity area rating of 11,674. This graph, shown in Figure 2, is a tool to visualize the 5DPM complexity as determined by the project team. A maximum possible rating area is 24,000 (if all five dimensions are rated 100) and an average rating area is 6,000 (if all five dimensions are rated 50). The team identified the following dimensions as significantly more complex:

- **Context** (Complexity Score of 85) – Specific factors that make context the most complex project dimension include:
  - Limited construction time frame in the water due to seasonal windows for regional fish spawning
  - The need for legislative support and environmental clearance to pursue construction
  - The challenges of coordinating with many significant and influential stakeholders, including the general public, tribal communities, and legislative, political, and environmental regulatory agencies
- **Finance** (Complexity Score of 80) – Specific factors that make finance a complex dimension include:
  - Project funding comes from multiple stakeholders—including FHWA, FTA, WSDOT, King County, and other local sources—and will require a firm understanding of revenue availability from all sources.
- **Technical** (Complexity Score of 75) – Specific factors that make the technical dimension complex include:
  - The challenge of maintaining safe operations and capacity for pedestrian, bicycle, and vehicular traffic, including Americans with Disabilities Act (ADA) access, during construction
  - Adherence to environmental requirements, such as fish-spawning windows that constrain in-water construction time

The 5DPM method illustrated in this case study can be applied as a benchmark starting before a project's implementation, and periodically throughout the project's development stages. By identifying the greatest complexity at various points in time, project managers are empowered to allocate resources to the most complex dimension at that particular time.

Figure 2



#### Resources to Help You Use Project Management Strategies for Complex Projects (R10)

- A **demonstration workshop** enables State and local transportation personnel to realize the product benefits first-hand by applying it to a real project.
- The project team receives a **summary report** after the workshop, which outlines the **action plans and execution tools** to manage project complexities.
- **Training** for agency staff in facilitating an R10 workshop, and its related training materials are available to learn the skill set to apply the product to future projects.
- The product's **guidebook and other materials** are available on the Transportation Research Board website: <http://www.trb.org/Main/Blurbs/167482.aspx>

To learn more, visit <http://www.fhwa.dot.gov/GoSHRP2/Solutions/Renewal/R10> or contact:

- **Carlos F. Figueroa, P.E.** (FHWA Office of Innovative Program Delivery) at [carlos.figueroa@dot.gov](mailto:carlos.figueroa@dot.gov)
- **Keith Platte, P.E.** (AASHTO) at [kplatte@ashto.org](mailto:kplatte@ashto.org)

“ The product and workshop emphasize more than the scope, schedule, and budget. Context isn’t always given consideration, but it’s very important...The product gets people on board and thinking about these areas, including project finance. ”

– Stephen Levensgood,  
Washington State Ferries



Members of the WSDOT project team discuss the Seattle Multimodal Ferry at Colman Dock project.

The workshop program provides a collaborative environment to promote team communication and decision making. Successful workshops involve representatives from each of the project areas, such as environmental, geotechnical, and construction engineers, to ensure the team addresses all levels of project complexity.

## 2 Exploring Five Methods for Managing Complexity

Once the WSDOT team identified the project complexities and developed the complexity map, it applied the **five R10 methods** to better manage the project.

Method	Examples of Team Insights
Define critical project success factors	<ul style="list-style-type: none"> <li>Obtain agreement on the project scope with external partners, including legislative, political, and environmental groups.</li> <li>Secure total funding through all possible revenue streams.</li> <li>Optimize the project design and the contractor’s means and methods within the fish-spawning window constraints.</li> </ul>
Assemble project team	<ul style="list-style-type: none"> <li>Hire a public information specialist to communicate to stakeholders before and during construction.</li> <li>Hire a permitting specialist to focus on the overall project permitting approval process.</li> <li>Hire a consultant to prepare a comprehensive project financial plan.</li> </ul>
Select project arrangements	<ul style="list-style-type: none"> <li>Co-locate the project manager, planners, and engineers in a single office location to work together more efficiently and accelerate decision making and approvals.</li> </ul>
Prepare early cost model and finance plan	<p>The team mapped the project’s cash inflow and outflow and identified secured and unsecured funding sources. After the exercise, the team:</p> <ul style="list-style-type: none"> <li>Determined that there appears to be sufficient funding from Federal, State, and local sources to cover the project cost.</li> <li>Considered reviewing their formal risk assessment to include project context risks.</li> </ul>
Develop project action plans	<ul style="list-style-type: none"> <li>The team developed seven action plans to successfully manage project complexities. Figure 3 on page 4 illustrates the process of identifying an action plan following the 5DPM approach.</li> </ul>

## 3 Applying Project Execution Tools and Action Plans

Next, the WSDOT team developed action plans to manage the identified areas of complexity. They considered each of the **13 R10 project execution tools** listed below and selected (▶) 9, which they used to create 7 action plans.

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|---|--|
| ▶ 1. <b>Incentivize Critical Project Outcomes</b>           | ▶ 7. <b>Determine Work Package/Sequence</b>    |
| ▶ 2. <b>Develop Dispute Resolution Plan</b>                 | ▶ 8. <b>Design to Budget</b>                   |
| 3. Perform Comprehensive Risk Analysis                      | ▶ 9. <b>Co-Locate Team</b>                     |
| ▶ 4. <b>Identify Critical Permit Issues</b>                 | 10. Establish Flexible Design Criteria         |
| 5. Evaluate Applications of Off-Site Fabrication            | ▶ 11. <b>Evaluate Flexible Financing</b>       |
| 6. Determine Required Level of Involvement in ROW/Utilities | ▶ 12. <b>Develop Finance Expenditure Model</b> |
|   | ▶ 13. <b>Establish Public Involvement Plan</b> |

Figure 3 on page 4 outlines the 5DPM process for developing action plans.

Figure 3

## The Development of a 5DPM Action Plan for WSDOT

Figure 3 illustrates the development of one of WSDOT's 7 action plans.



“ The R10 product has additional applications for other complex WSDOT projects...We've talked about these issues previously, but not with everyone together at the table. It's been very valuable. The workshop produces action plans that identify who is responsible for each deliverable. ”

– Mark Gaines, WSDOT



### Next Steps

FHWA will provide the following support:

- Funding for assistance in developing a WSDOT standard method to determine the appropriate contracting and project delivery method
- Assistance in developing and institutionalizing a WSDOT project management policy that incorporates 5DPM

### Implementation Benefits

WSDOT will continue to use R10 leading up to the construction phase, scheduled to begin in 2017. However, the project team has already benefitted from the product by:

- Conducting an in-depth self-assessment to determine opportunities to improve the complex project management maturity and capability in all phases of project development.
- Identifying potential alternative sources of project funding.
- Acknowledging the need to hire consultants who can assist them with financial planning, securing permits, and communicating public information.



### Implementing SHRP2

The second Strategic Highway Research Program (SHRP2) is a national partnership of the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the Transportation Research Board. Together, these partners conducted research and are deploying resulting products to help the transportation community enhance the productivity, boost the efficiency, increase the safety, and improve the reliability of the Nation's highway system.

The Washington State Department of Transportation applied *Project Management Strategies for Complex Projects (R10)* on the Seattle Multimodal Ferry Terminal at Colman Dock project as part of the SHRP2 Implementation Assistance Program.