2015 FIDIC Awards
Oregon Transportation Investment Act III State Bridge Delivery Program
A Blueprint for Sustainable Infrastructure Investment

Oregon officials knew the state’s transportation infrastructure needed modernization after routine inspections identified expanding cracks in several highway bridges in 2001. Their holistic solution offers a new blueprint for sustainable infrastructure investment.

The Oregon Transportation Investment Act (OTIA) III State Bridge Delivery Program shows how innovative program management can provide a high return on investment for massive public infrastructure projects—without sacrificing the needs of local communities, the traveling public or the environment. The $2.1 billion program included nearly 90 major projects and repair or replacement of more than 270 of the state’s aging highway bridges. The budget comprised $1.3 billion in OTIA monies and $800 million in additional funding.

Oregon Bridge Delivery Partners (OBDP), a joint venture between HDR and Fluor Corporation, developed a streamlined, big-picture plan that saved the Oregon Department of Transportation (ODOT) more than $2 billion in costs avoided. Cost-saving measures included a simplified design exception process, collaboration with 11 public agencies to standardize permitting, and implementation of a new Work Zone Traffic Analysis tool. Developed by HDR, this new technology minimized traffic congestion during construction and proved so beneficial that ODOT implemented it statewide. Additionally, a traffic management strategy saved the traveling public more than $210 million in delays avoided throughout the program.

The team demonstrated exceptional outreach to provide opportunities for community input. For example, OBDP and ODOT engaged the public to develop design guidelines for bridges in the Columbia River Gorge to complement the designated National Scenic Area. The public involvement process included six public meetings and 27 stakeholder meetings involving more than 400 people and resulted in 17 bridges in the Gorge with architecture that complements the landscape. OBDP also worked alongside communities to create environmental and social benefits beyond the infrastructure improvements. They enhanced local parks, provided new habitats for bats and restored key salmon habitats.

The program also stimulated the economy by creating or sustaining nearly 22,000 jobs during one of the worst recessions in United States history. The team partnered with state workforce development organizations to provide job training for potential construction workers.

OBDP completed the program on schedule and $45 million under budget. The OTIA III State Bridge Delivery Program provides a model for delivering the triple bottom line of social, environmental and financial benefits.
Innovation, Quality and Professional Excellence

The size and scale of the OTIA III State Bridge Delivery Program, as well as legislative mandate, demanded an innovative approach to deliver quality design and engineering. The OBDP team developed a streamlined, big-picture plan focused on efficient project delivery while minimizing construction impacts on the traveling public and local communities. Strong partnerships and innovative planning saved the state millions of dollars.

Agency Collaboration Streamlines Permitting, Saving Time and Money

With nearly 90 major projects involving more than 270 structures encroaching upon multiple endangered species habitats, the team identified project permitting as a critical factor for bridge program success. Consequently, the team worked with 11 state and federal agencies to combine 14 statutes into a single set of standards applicable to the entire program. This standard permit, which could be used on any project in the program that met necessary thresholds, streamlined the review process. This measure saved an estimated $73 million and significant time, while also providing more flexibility for contractors.

“At a time when every dollar counts, we are proud to have confirmation that we are providing a good return on the investment Oregon is making in its transportation infrastructure,” said Tom Lauer, manager of ODOT’s Major Projects Branch.

This effective collaboration between the delivery team and public agencies proved nothing short of a game-changer for a program this massive. The programmatic permitting effort earned national recognition from multiple organizations—including the Federal Highway Administration—for its cost-saving benefits and efficiency.

Custom Work Zone Traffic Analysis Tool Keeps Travelers on the Go

Managing projects on a corridor-based model—rather than addressing projects with the greatest need first—created opportunities for cost savings but also raised potential for traffic congestion. To address this concern, the OBDP/ODOT team implemented strict delay thresholds on a corridorwide basis, including numerous work zones on Interstate 5 and Interstate 84. Spanning 300 to 400 miles border to border, thresholds couldn’t exceed 40 minutes for an entire corridor.

HDR developed a Work Zone Traffic Analysis tool to enforce the program limits. A subsequent study determined the tool had a cost-benefit ratio of 3.6, meaning the state received $3.60 in cost savings for every dollar spent in its development and use. The traffic management strategy saved the traveling public more than $210 million in delays avoided. This tool proved so successful that ODOT implemented it on other projects statewide.

In addition to saving costs, the tool helped keep traffic moving. “OBDP worked closely with our industry to make sure our transportation needs were met,” said Don Miner, executive director of the Oregon Manufactured Housing Association. “They had an impossible job, and I never heard a single complaint from the companies I represent. The work they did to keep bridges and highways open during construction was vital to our industry’s ability to deliver homes to our customers and keep our factories working.”

Process Improvement Avoids Millions in Additional Costs

With a fixed budget, the HDR/Fluor team knew the imperativeness of identifying cost savings early in the process. Working within existing ODOT and FHWA exception processes, they developed a simplified design exception process to accelerate decision making. It’s estimated this process saved nearly $700 million in potential additional program costs.

Through Public Involvement, Bridges Reflect Their Communities

As a statewide endeavor, the OTIA III State Bridge Delivery Program exhibited an exceptional public outreach process to inform the public and provide opportunities for community input.

This was particularly evident during development of specific design guidelines for bridges in the Columbia River Gorge—a designated National Scenic Area. The OBDP/ODOT team conducted six public
meetings and 27 stakeholder meetings involving more than 400 people to develop comprehensive design guidelines. The result met the interests of the Gorge communities as well as those of government stakeholders, including the Columbia River Gorge Commission, the U.S. Forest Service, cities and counties in the Gorge, and the four Native American tribes with interests in the Gorge.

The OBDP/ODOT team’s effort led to successful repair or replacement of 17 Gorge bridges matching what residents and stakeholders envisioned for this National Scenic Area.

**Transparency and Integrity in Management and Program Implementation**

**Communication and Trust Make New Approach Successful**

Hiring a private firm to manage the bridge program marked a historic shift by ODOT from being an agency that designs and constructs projects to one that oversees the transportation system. The program’s success resulted from the transparency and integrity exhibited by the entire team—which required ODOT and HDR/Fluor to manage more than 120 consultants involved as contractors.

The outsourced delivery strategy allowed minimal use of permanent ODOT staff, while the private-sector partners could hire as appropriate for the duration of the program.

ODOT and OBDP set up teams with mirrored positions so peers from both organizations could collaborate to resolve issues. This effective structure delivered the program seamlessly. This required OBDP to make daily decisions on behalf of ODOT, requiring transparency of information and regular accountability.

Because of the bridge program’s length, scale and complexity, program management required strategies and tactics well beyond those experienced in traditional project management roles.

Traditionally, ODOT is responsible for direct management of all program activities and is the principal interface with its organizational elements and stakeholders. Under the program management model implemented to meet the program’s objectives, ODOT retained overall responsibility, accountability and decision-making, but in a more executive, strategic-oversight role. OBDP provided independent management of program delivery activities to include adequacy of processes, systems, procedures, controls, reporting, payments and performance, including robust and comprehensive risk assessment and overall budget management.

**Careful Tracking and Reporting Fosters Transparency in Decision Making**

In the beginning, the driving force was to ramp up quickly by bringing in a large, talented and diverse staff who would use industry best practices to deliver the program. At its peak, this public-private partnership consisted of more than 3,200 people working to deliver the bridge program.

ODBDP provided more than 30 program management and 70 architecture and engineering services, managed 123 subcontracts, and provided construction engineering and inspection services to 130 construction contractors. Managing a program with so many team members, variables and simultaneous projects increases the potential for conflict. The HDR/Fluor team addressed this risk in several ways. Initially, they developed a GIS database to help geographically place individual bridges so they could be grouped, or bundled, which minimized congestion and maximized opportunities.
for smaller local contractors to bid on the packages.

Once the program was underway, the team developed a program management reporting tool, the Bridge Reporting System, allowing for clear and concise monthly project reporting throughout the state. With it, ODOT could track progress monthly and report progress to the Legislature.

**Integrity Helps Align a Wide Array of Program Stakeholders**

Because of the program’s size and scope, OBDP made sure stakeholders understood expectations. Early in the program, the OBDP/ODOT team connected with counterparts in each of the five ODOT regions responsible for regular highway operations throughout Oregon.

Working closely with the regions in regular meetings allowed OBDP to obtain up-front consensus and thus significantly reduce effort needed to develop and implement projects. OBDP also engaged with other centralized divisions in ODOT and the Oregon Transportation Commission.

In addition to meeting the goals of the owner, the OBDP team met the needs of disparate external stakeholders. OBDP worked with the Oregon Trucking Associations and AAA to minimize traffic delays. Work with the Gorge Commission resulted in the successful development of guidelines for projects along Interstate 84 in the Columbia River Gorge, and collaboration with Native American tribes succeeded in a variety of settings, including workforce training for Tribal Employment Rights Office-eligible workers and successful implementation of design enhancements for the Whilamut Passage Bridge.

**Collaboration Provides Budget Accountability—and Savings**

Financially, OBDP managed $2.1 billion of state money and rigorously accounted for every penny through change management requests. The team researched, documented and resolved more than 100 potential error and omission issues approved jointly by OBDP and ODOT. Together, they completed the program on time and $45 million under budget.

“It took a partnership between OBDP and ODOT to do it, and together, we have demonstrated that we can be counted on to deliver what we promised, with confidence and accountability,” said ODOT Director Matt Garrett.

**Sustainability and Respect for the Environment**

The forward-thinking approach to sustainability took hold at the onset of the bridge program with the development of the innovative Context Sensitive and Sustainable Solutions program, or CS^3. Designed through a collaborative effort between OBDP and ODOT, CS^3 is intended to meet traditional DOT goals of maintaining safety and mobility while reflecting community values, supporting economic prosperity, achieving responsible stewardship of the natural environment and facilitating cost-effective solutions.

**Team Uses Bridge Projects to Deliver Creative Environmental Enhancements**

The HDR/Fluor team collaborated with communities to use bridge projects to enhance local parks, provide new habitats for bats, use biodiesel to power off-road equipment and restore key salmon habitats where possible.

In Troutdale, OBDP partnered with the community to develop a bicycle bridge across the Sandy River allowing cyclists from the Portland metropolitan area to safely access the Columbia River Gorge. The effort met a long-standing goal of the cycling community.

In areas prevalent with bats, designers modified bridges to include one of three habitat types (crevice, cave-like or wedge bat boxes) into the projects. Nine of 11 projects evaluated showed signs of bat use within one year.

Early in design stages of a project in the destination-resort community of Hood River, OBDP staff learned the planned detour route would divert Interstate 84 traffic through downtown, onto roads neither designed for nor capable of dealing with the high traffic volume. OBDP worked with the community and its engineering subcontractor to reroute the detour over a lane of freeway instead. The change minimized travel delays and eliminated
negative impacts of diverting traffic through commercial and shopping districts.

Finally, wherever possible, the project team restored habitat for endangered salmon and other species as part of design and construction. Near Elkton—through a partnership between the OBDP/ODOT team, the contractor and the Oregon Department of Fish and Wildlife—logs and stumps from 300 trees felled for construction were used to restore salmon habitat in Paradise Creek and Brad’s Creek, two critical areas in the Umpqua River basin.

**New Tools Report Program Benefits to Environment, Economy and Diversity**

To monitor and communicate the economic impacts and the progress of the CS³ program, the bridge program’s monthly progress report included sections on diversity in contracting and economic stimulus. In addition, OBDP developed annual reports to summarize the bridge program’s success in CS³, economic stimulus and environmental performance, a first for an ODOT project of this magnitude.

The team used GIS software to develop mitigation banks, demarcate wetlands and identify sites that could be used for economic development close to projects. The OBDP team developed or implemented eight additional software tools to streamline work and improve performance. A benefit-cost analysis of these custom software tools showed a return on investment of 2.1 to 1; an investment of $3.5 million resulted in $7.3 million in costs avoided.

**Economic Sustainability**

By design, the bridge program served as an economic stimulator for the state, but it also staved off potential economic downturn from Oregon’s aging infrastructure. Engineering studies indicated that cracking on 140 of the state’s highway bridges warranted immediate weight restrictions that would result in the loss of 88,000 jobs and $123 billion over the next 25 years if the state had not acted.

The Oregon Legislature funded the program with the express goal of stimulating the private-sector economy. The HDR/Fluor team developed specific guidelines to maximize job creation. The bridge program created or sustained nearly 22,000 jobs over the life of the program, with more than 90 percent of program funding going to local firms. Those jobs proved critical amid one of the worst recessions in U.S. history.

The HDR/Fluor team worked with contractors, ODOT and state workforce development organizations to provide companies with trained, entry-level construction workers. Workforce development organizations conducted preliminary training statewide and provided apprentices and pre-apprentices with the skills they needed to get into construction and build sustainable careers. The team met or exceeded the client’s goals in disadvantaged, minority-owned, woman-owned and emerging small business contracting.

**Conclusion**

The Oregon Transportation Investment Act III State Bridge Delivery Program provides a blueprint for sustainable infrastructure investment. The $2.1 billion program included nearly 90 major projects and repair or replacement of more than 270 of the state’s aging highway bridges. Oregon Bridge Delivery Partners, a joint venture between HDR and Fluor Corporation, developed a streamlined, big-picture plan that saved the Oregon Department of Transportation more than $2 billion in costs avoided. Cost-saving measures included a simplified design exception process, collaboration with 11 public agencies to standardize permitting, and implementation of a new Work Zone Traffic Analysis tool. The program finished on schedule and $45 million under budget. The program exhibited sustainability by creating jobs, providing a positive return on investment for expenditures, and delivering safe, modern infrastructure.