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ODOT's OTIA III BRIDGE PROGRAM: THREE YEARS OF ENVIRONMENTAL STEWARDSHIP

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Abstract: The purpose of the environmental stewardship framework is to deliver projects that are sensitive to their communities and landscape while streamlining the permitting process. After three years of implementation, we have successfully maintained the collaborative approach with regulatory partners. This has been critical to our success in avoidance and minimization of project impacts.

The OTIA III State Bridge Delivery Program (the Program) is part of the Oregon Department of Transportation's (ODOT) 10-year, \$3 billion Oregon Transportation Investment Act (OTIA) program. OTIA funds will repair or replace hundreds of bridges, pave and maintain city and county roads, improve and expand interchanges, add new capacity to Oregon's highway system, and remove freight bottlenecks statewide.

Oregon Bridge Delivery Partners (OBDP), a joint venture formed by HDR Engineering Inc. and Fluor Enterprises Inc., is a private-sector firm that has contracted with the ODOT to manage the \$1.3 billion state bridge program. OBDP has developed a framework to integrate the myriad of tools developed for the Program, including environmental performance standards, a joint batched-programmatic biological opinion, environmental and engineering baseline reports, and a web-based GIS. The purpose of this framework is to identify environmental concerns early in the project development process and communicate these concerns to design teams and regulatory agencies to promote environmental stewardship through impact avoidance and minimization.

Innovative and creative use of technology has been a keystone to the framework. Environmental professionals input the relevant environmental data for a project in a comprehensive, on-line Pre-Construction Assessment (PCA) form. The data are used to identify project challenges (e.g., archaeological sites or wetlands within the project footprint) and compile electronic reports to the regulatory agencies. Environmental metrics, such as exempted T&E species "take" and wetland fill quantities are tracked using the GIS database. One framework meets the needs of many stakeholders.

Now, after almost three years of execution, OBDP and ODOT have some great successes and lessons learned to share. OBDP have continued to adapt and develop tools to be successful – as well as shift the Program operating structure. The focus of this presentation will be on the framework that has been utilized to maintain compliance and strive for environmental excellence.

Introduction and Background

The OTIA III State Bridge Delivery Program (the Program) is part of the Oregon Department of Transportation's (ODOT) 10-year, \$3 billion Oregon Transportation Investment Act (OTIA) program. During the next decade, OTIA funds will repair or replace hundreds of bridges; pave and maintain city and county roads; improve and expand interchanges; add new capacity to Oregon's highway system; and remove freight bottlenecks statewide. The Program is also expected to decrease unemployment and increase economic development. About 17 family-wage jobs are sustained for every \$1 million spent on transportation construction in Oregon. Each year during the OTIA program, construction projects will sustain about 5,000 family-wage jobs.

In 2003, the Oregon Legislature enacted the third Oregon Transportation Investment Act, or OTIA III. The package includes \$1.3 billion for bridges on the state highway system. During the next eight to ten years, the ODOT's OTIA III State Bridge Delivery Program will repair or replace hundreds of aging bridges on major corridors throughout Oregon.

Oregonians have not seen an investment of this magnitude in highway and bridge construction since the state's interstate freeway system was built in the 1950s and 1960s. The sheer size and scope of the bridge program means that the ODOT must change how it does business. The agency hired Oregon Bridge Delivery Partners (OBDP), a joint venture formed by HDR Engineering Inc. and Fluor Enterprises Inc., to assist in the management of the program. The ODOT is making a historic shift from an agency that self-performs its design and construction projects to one that manages the transportation system.

Many of the bridges slated for repair or replacement are on Interstate 5 and Interstate 84, which are the state's economic lifeline routes. These interstate highways carry most of Oregon's commercial truck traffic. If the hundreds of aging bridges on these routes and others are not repaired or replaced, the ODOT will soon be forced to place weight limits on highway bridges that would impair Oregon's economy.

The ODOT and OBDP are utilizing this program to implement a new decision-making framework called CS3, or Context Sensitive and Sustainable Solutions. CS3 helps to preserve Oregon's scenic, aesthetic, historical, cultural, economic, environmental, and other values while building safe and enduring projects. It is community values shaping a new generation of bridges. CS3 puts communities at the heart of important project decision-making.

Through the CS3 initiatives, the bridge program will help produce a better trained workforce, prosperous communities, a stronger state economy, and bridges that take into account their impact on the natural environment.

Collaborative Approach

The ODOT has been working collaboratively with federal and state agencies to integrate and coordinate environmental protection, permitting, enhancements, and reuse and recycling into the overall Program. The Environmental Performance Standards (EPS) have been developed to ensure safe practices with regard to hazardous materials, to protect Oregon's natural resources, and to provide economic stimulus by expediting the Program.

In 2004 and 2005, multi-disciplinary teams representing key federal and state agencies developed the EPS with the goal of creating well-integrated and consistent terms and conditions for each agency's respective regulatory process. The EPS provide consistent expectations and guidelines for design and construction teams to meet ODOT and regulatory agency requirements for completion of the bridge program, and cover expectations for the program ranging from habitat and species protection through materials reuse and recycle.

The ODOT also realized that successful program management means sustained collaboration. The regulatory partnerships needed to be maintained on the program and open communication regarding all project elements was vital. To facilitate this effort, two key regulatory partner teams have been established. The first team is the Programmatic Agreements Reporting and Implementation Team (PARIT), made up of regulatory partners from Oregon Department of State Lands (DSL), U.S. Army Corps of Engineers (ACOE), Oregon Department of Fish and Wildlife (ODFW), US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Oregon Department of Environmental Quality (DEQ), Federal Highway Administration (FHWA), State Historic Preservation Office (SHPO), ODOT and OBDP, which meets twice a month. The second team is the Materials and Contamination team, made up of members from ODOT, DEQ, and OBDP, which meets monthly. The teams provide an avenue for open communication that allows all the agencies to work through project questions/concerns early in development and provide enhanced Program oversight.

Permitting

The new approach to permitting for the Program includes a batched, programmatic Biological Opinion (BO), a Regional General Permit (RGP), and 401 Water Quality Certification. The EPS are the guidance to the design and construction teams to show that the intent of the programmatic permits is being met. The EPS present the intent and goals of the regulatory consultation and provides guidance on acceptable implementation methods to achieve the performance criteria. However, the permits were created for the entire State and cross many different ecological systems (ecoregions). When developing the Program, it was understood that variances to the EPS and the permits may be required. The BO outlines the required variance process to be followed if these circumstances are determined on the Program projects.

Variances

Successful program implementation and stewardship means the continued collaboration with the regulatory partners when it is noticed that the EPS and permits may need to be varied from. There have been projects that have shown that variances can be beneficial. For one particular project, the regulatory agency partners, OBDP, and ODOT staff worked together to determine the need for a variance and all concurred in this instance the variance would be beneficial. The project clearly met the goal of the EPS with implementation methods that deviated from the pre-approved implementation methods.

During a field visit, one regulatory agency expressed concern about the applicability of the fluvial EPS to a particular site on Hardscrabble Creek in the Umpqua River basin. The consultant believed that, given the backwater effect from a main-stem river downstream, the fluvial standards could not be implemented as outlined unless a much longer bridge than would otherwise be necessary were designed.

Within a week, all Program partners met and agreed that an alternative approach was required, ultimately approving a variance request that would allow the design-build contractor to proceed. The regulatory agencies agreed that a variance was a positive solution to a unique situation, since this bridge crossing is one of very few bridges in the program that the methods within the EPS do not accurately address. The variance still meets the intent of the EPS goal, will clearly demonstrate that the design meets the fluvial EPS, and will satisfy the requirements of the Program's BO. This resulted in an overall win for the affected parties. Bringing the regulatory agencies into variance discussions as early as possible improves the overall success of the project designs.

Avoidance and Minimization

Building projects sensitive to their communities and landscape is one of the five OTIA III Program Goals. This goal, at the heart of the OTIA III Environmental Stewardship Program, prioritizes avoidance and minimization efforts. After three years, implementation of the avoidance and minimization philosophy has been highly successful.

To date, every eligible bridge delivered through OBDP has used the programmatic permitting strategy. More than 56 bridges have been constructed and almost 70 more are in construction, with an additional 159 bridges that are in various stages of design and approaching the construction stage. ODOT/OBDP environmental staff have, to date, conducted over 800 construction monitoring/inspection visits – with no permit violations. Less than 10 percent of the program exempted “take” has been allocated for any species. The avoidance and minimization measures outlined in the EPS have been so effective that no on-site compensatory mitigation has been required. We have had equal

successes implementing this framework with design-build and design-bid-build delivery. We look forward to continued success as we maintain our most effective tool – collaboration.

Wetlands and waterways are within the “Area of Potential Impact” (API) of nearly 80% of the 365 program bridges; however, less than 20% of the projects have impacted aquatic resources to date. Many of those impacts are associated with temporary structures (e.g., work area isolation, detour bridges, work platforms, containment structures) or enhancements (removal of existing fill within the floodplain or riparian corridor). There has been less than 15 cubic yards of permanent fill added and almost 300 cubic yards of fill removed from wetlands or waterways, thereby promoting natural habitat-forming processes (e.g., floodplain development and fluvial dynamics).

Nearly every bridge within the Program has habitat for some sensitive species – from birds (marbled murrelets, northern spotted owl, etc.) to fish (salmon, suckers, etc.) to invertebrates (vernal pool fairy shrimp, Fender’s blue butterfly, etc.) to plants (Kincaid’s lupine, Bradshaw’s lomatium, etc.). The Program has a batched-programmatic biological opinion that allocated incidental “take” for 22 threatened or endangered species. To date, OBDP have determined the amount and extent of take for over 30% of the bridges, and assigned less than 1% of the “take” allocated in the BO for the Program. Looking forward, it is possible that OBDP will complete the program with less than 10% of the entire take allocation being used. After three construction seasons, there has not been any lethal take on the Program. Overall, the Program is exceeding avoidance expectations.

Materials and Contamination

The Materials and Contamination performance standards were added to the EPS in September 2005. The Materials and Contamination Environmental Performance Standards include three primary environmental areas: 1) Management, 2) Materials Management, and 3) Contamination Discovery and Management. In an effort to meet requirements of the Governor’s Executive Order on Sustainability, the ODOT is tracking information on construction and demolition waste management, recycled materials use, fuel selection, and equipment retrofitting for particulate emissions, in order to report on success in meeting Program goals.

This particular EPS identifies reuse and recycling goals for the Program as well as identifies safe handling practices for materials. Use hierarchies are discussed for all materials and outlines preferred reuse methods including on-site use all the way down to landfilling. The EPS provides guidance to the construction contractor for managing material waste streams.

Design

Part of the success of the stewardship process is how well the program expectations are encompassed into the bridge designs. To assist in this, a series of tools are used in the design stage of the projects. These tools help to create the CS3 projects that the regulatory agencies and state partners are expecting. The ODOT created Engineering and Environmental Baseline Reports to provide an early evaluation of the project areas and identify potential areas of concern. The baseline reports help to identify resources within the project area that may be affected by the bridge construction. The resources include natural resources, wetlands, cultural and historic, materials and contamination sites, and Environmental Justice populations, among others. Engineers and designers utilize this information to aid in the design of a bridge that is not only structurally sound and safe, but also avoids or minimizes the impacts to resources near the bridge area.

The design teams utilize the EPS to determine the best path forward in creating a CS3 project package. Innovative and creative use of technology has been a keystone to the framework. Environmental professionals input the relevant environmental data for a project in a comprehensive, on-line Pre-Construction Assessment (PCA) database. The design team utilizes the baseline information, EPS, and site visit data to complete the PCA requirements.

The data are used to identify project challenges (e.g., archaeological sites or wetlands within the project footprint) and compile electronic reports to the regulatory agencies. Environmental metrics, such as exempted T&E species “take” and wetland fill quantities are tracked using the GIS database. Thus, one framework meets the needs of many stakeholders.

How to successfully implement the permits into construction contracts was a key lesson learned in the design portion of our projects. The permit and EPS requirements needed to be translated into specification language. OBDP started to receive specifications from the design A&E firms that varied widely on how they wrote up the commitments and tried to make them enforceable. At that time, OBDP determined it would be better and more cost and time efficient, and help verify that the commitments were being incorporated into the specifications if a template specification was created.

The tools used in design provide more consistent construction documents (plans and specifications) to ensure the Program permits and regulatory commitments are transferred to the construction phase of the projects.

Construction

OBDP and the ODOT have set up a number of contractual requirements which promote environmental stewardship and collaboration with the construction sector. One such requirement is providing an environmental stewardship training session to the construction contractor's staff. In the environmental stewardship training, the basis of the Program is explained. The training includes the biological opinion, the streamlined permitting process through the PCA, and the EPS are discussed along with erosion and pollution control requirements, incident response / violation procedures, communication procedures, and project specific environmental concerns. This training lays out the roadmap construction contractors need to follow in order to remain in compliance with the program permits and the overall program goal, and lays out in detail the implications of failure to maintain compliance with the program permits. Expectations for environmental compliance are outlined: how will a site be assessed? What would a compliant item look like? What is non-compliant? Recurring issues are discussed, and the environmental stewardship training provides a forum for training and guidance to limit or prevent future recurrences. This is part of the outreach to construction contractors.

During construction the environmental stewardship framework is implemented through environmental compliance inspections. The objective of environmental compliance inspection is to document the project compliance with respect to the program permits and the construction contract and aid construction contractors in understanding the environmental concerns. A large portion of our construction compliance is to teach contractors about the Program and environmental stewardship and to grow everyone's ownership in the Oregon environment. Compliant and non-compliant items are documented as well as the corrective action and associated timelines necessary to get a project back into compliance with the project permits. Since program inception, OBDP has completed almost 800 environmental compliance inspections on 20 construction projects.

Most inspections are completed in conjunction with the construction contractor, and findings are shared with the contractor, OBDP, ODOT, and regulatory agencies through an online document management system. The most commonly observed items requiring correction are associated with erosion control and pollution control, such as improper installation of erosion control materials or minor fuel spillages. Contractors were able to quickly repair or remediate the situations before the issue resulted in a permit violation, demonstrating an increasing initiative in preventing environmental permit violations.

The inspections allow OBDP staff members to identify areas where improvement may be necessary and/or required to improve compliance with permits and to provide a larger overall benefit to terrestrial and aquatic species and habitats. Periodic inspections help the environmental staff identify problems so they can be fixed before becoming more serious and potentially result in a formal violation from a regulatory or resource agency.

The result of this collaborative environmental stewardship framework is that, to date, no regulatory or resource agency has issued a formal violation of an environmental permit. Additionally, this collaborative approach to environmental compliance inspection is changing the construction culture; construction contractors, taking a more proactive approach to environmental stewardship, are recognizing the benefit of the programmatic permits. Lessons learned during environmental compliance inspection will continue to be incorporated into future contracts for both the Program projects as well as other ODOT projects.

Construction Waste Reuse and Recycling Stewardship

As part of our stewardship goals and the implementation of the Materials and Contamination EPS in construction, OBDP has requested that construction contractors report on the reuse and recycling efforts on their projects. There will eventually be a contractual requirement for such reporting, but for the moment, ODOT and OBDP are working with the construction contractors to raise awareness of reuse and recycling. As part of that effort, the contractors have voluntarily documented and reported on their projects.

In 2006, construction contractors reported an estimated savings over \$650,000 on reuse and recycling of project materials; however, the savings are expected to be much higher as a result of substantial unreported cost savings. The program has also seen a great increase in construction contractor communication. Two projects within the same general vicinity, with two different contractors, worked together to recycle materials from one site for re-utilization as fill at the other site. This exchange saved disposal costs, trucking costs and time, and allowed the one project to save the expense of purchasing fill since the two contractors agreed to exchange the material at no cost.

On another project, approximately 90 percent of the 88 pre-stressed concrete box beams manufactured for the detour bridge were reused on detour structures at other projects. OBDP and ODOT worked together to arrange for recycled surplus pipe piles left over from construction to be transferred to a project in need of such pipes. On another occasion, "retired" signs were put to use as forms.

Another project success was not tied to the EPS. A construction contractor in need of electrical power on a remote site set up solar-powered portable traffic signals, which not only reduced negative impacts on the environment and maintained mobility commitments, but also saved time and money for the project. This is also a great example of increased contractor environmental awareness.

Lessons Learned

As part of our continued commitment to our environmental stewardship goals, program updates based on our design and construction lessons learned are continually being incorporated into our projects. A few key lessons learned included the specification template, which was described earlier in the “Design” section of this paper, and various matters relating to construction materials.

OBDP are continuing to try new products and processes with the potential to provide a benefit to the owner and resources, at the same time recognizing that we can and probably will encounter the failures which are intrinsic to the experimentation process. Experimentation and innovation have the potential to provide more cost-effective solutions to common issues, but the potential benefits must always be weighed against the cost of failure and its ramifications.

As part of the lessons learned process, OBDP incorporates observations of successful and unsuccessful construction materials and practices into future projects. OBDP has observed that some photodegradable erosion control matting materials made with plastic materials do not entirely photo-degrade when placed adjacent to and beneath new bridges, mainly as a result of low ambient light levels. This presents a potential threat to terrestrial and aquatic animal species because the materials that usually remain are the plastic mesh, which can become entangled in limbs when traversed or transported into water systems. As a result of this observation, OBDP and ODOT worked together to create a new specification requiring contractors to utilize 100 percent biodegradable erosion control matting on OTIA III projects within 50 feet of waterways. This is also a successful knowledge transfer item in that the ODOT is in the process of modifying the Standard Specifications for Construction to require this on all ODOT projects.

As discussed earlier, translating permit commitments and conditions to construction contracts continues to be challenging. Although the environmental performance standards outline the minimum requirements for compliance with the batched programmatic biological opinion, we have found that the commitments and conditions are not being consistently presented in construction contracts. Minor changes in language could result in entirely different interpretations when in construction. Such inconsistencies have also increased review times by forcing reviewers to spend time searching through a submittal to locate EPS requirements.

Unless commitments made in the permitting packages are transferred into the construction contract, a construction change order might have to be requested or a permit modification pursued. Change orders, even ones which result in a net savings or in no additional cost, have the potential to delay a project. Permit modifications can result in more impact (within the terms of the BO) to sensitive environmental resources or additional cost to the construction contract for additional protective measures required by resource or regulatory agencies as a condition of the permit modification.

Recognizing that continued minor inconsistencies in construction contracts could result in major issues during construction, specification templates were developed to help streamline the design process with regard to environmental requirements as well as to increase the consistency of EPS incorporation into the construction contracts. In addition, the specification templates incorporate enforceable language proposed from design firms and internal sources as well as lessons learned during previous construction seasons.

OBDP are working with our design teams to better incorporate good environmental stewardship into designs and with our construction teams to promote environmental stewardship during project delivery. Ultimately, OBDP and ODOT are striving to change a culture in both design and construction, to better protect and improve the resources of the State of Oregon.

Conclusion

Through continued collaboration and a high level of communication with Federal and State partners, ODOT and OBDP have continued to have a successful environmental stewardship program on the Program. As design and construction continue to ramp up over the next year and beyond, these principles are going to be critical for continued success.

Design continues to be completed for avoidance of environmental impacts limiting the need for mitigation on this Program. This additional benefit to the environment highlights how well the communication, programmatic permits, and EPS work to provide guidance on environmental requirements.

The construction inspection team set up on the Program continues to work with construction contractors as a “training” opportunity, not as an enforcement opportunity. The inspection team works as a partnering team with the construction community to raise awareness of the important environmental issues. This benefit is starting to be seen on non-Program projects and will continue to be the legacy of the success of the Program’s environmental stewardship program.

The environmental stewardship framework developed for the Program facilitates design and construction of projects that are sensitive to their communities and landscape while streamlining the permitting process. The collaborative approach with regulatory partners has been a key success in the avoidance and minimization of project impacts and the third year of successful environmental stewardship for the Program.

Biographical Sketches: Shelley D. Richards, HDR Engineering. Shelley has 12 years of experience in the environmental and transportation fields and has been with HDR for five years and was at ODOT prior to that. As the Environmental Manager for the Oregon Bridge Delivery Partners, Shelley oversees program design and construction oversight staff – operating throughout the State. Prior to the Program, Shelley was a Project Manager for challenging transportation projects, including rail and highway.

William A. Ryan, Oregon Department of Transportation. Bill has 18 years of experience in the environmental and transportation fields and has been with ODOT since 1996. As Permitting and Mitigation Manager and later Environmental Program Manager, Bill directed and oversaw development and implementation of the environmental stewardship and streamlining strategy for the OTIA III State Bridge Delivery Program, including the programmatic-batched BiOp that is the subject of this paper. Bill is currently overseeing multiple environmental streamlining efforts at ODOT's Salem Headquarters including stormwater permitting and ODOT's mitigation banking program.

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