

**INNOVATION IN ENVIRONMENTAL
STREAMLINING AND PROJECT
DELIVERY: THE OREGON STATE
BRIDGE DELIVERY PROGRAM**

Final Report

SR 500-151

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16. Abstract Surface transportation planning in the United States has become a complex system of intergovernmental planning and environmental compliance requirements over the past several decades. As a result, the process from planning stage to project implementation has become significantly lengthier with associated delays and cost increases. The field of in-depth case studies that might serve as templates to help agencies at various governmental levels develop effective environmental streamlining efforts is still relatively small. What are some of the critical elements of successful environmental streamlining? What individual, organizational and institutional features influence the development and implementation of such programs? A case study of the Oregon Department of Transportation's Bridge Delivery Program follows how one such effort went from idea to program and provides insights into factors that helped create an environmental streamlining program. The study should be of interest to practitioners, policy makers and academics.					
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in	inches	25.4	millimeters	mm	millimeters	0.039	inches
ft	feet	0.305	meters	m	meters	3.28	feet
yd	yards	0.914	meters	m	meters	1.09	yards
mi	miles	1.61	kilometers	km	kilometers	0.621	miles
<u>AREA</u>							
in ²	square inches	645.2	millimeters squared	mm ²	millimeters squared	0.0016	square inches
ft ²	square feet	0.093	meters squared	m ²	meters squared	10.764	square feet
yd ²	square yards	0.836	meters squared	m ²	meters squared	1.196	square yards
ac	acres	0.405	hectares	ha	hectares	2.47	acres
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<u>VOLUME</u>							
fl oz	fluid ounces	29.57	milliliters	ml	milliliters	0.034	fluid ounces
gal	gallons	3.785	liters	L	liters	0.264	gallons
ft ³	cubic feet	0.028	meters cubed	m ³	meters cubed	35.315	cubic feet
yd ³	cubic yards	0.765	meters cubed	m ³	meters cubed	1.308	cubic yards
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<u>MASS</u>							
oz	ounces	28.35	grams	g	grams	0.035	ounces
lb	pounds	0.454	kilograms	kg	kilograms	2.205	pounds
T	short tons (2000 lb)	0.907	megagrams	Mg	megagrams	1.102	short tons (2000 lb)
<u>TEMPERATURE (exact)</u>							
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<u>TEMPERATURE (exact)</u>							
°C	Celsius	1.8C+32	Fahrenheit	°F	Fahrenheit	1.8C+32	Fahrenheit

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EXECUTIVE SUMMARY

Surface transportation in the United States has evolved into a complex system of inter-governmental planning and management, as society seeks to integrate mobility and economic growth with environmental protection. Traditional transportation planning involves a variety of federal and state laws that can significantly delay project delivery and add to project costs. Environmental streamlining exists as an alternative to conventional planning and permitting as a means to increase project delivery efficiencies and reduce costs.

There is no set definition of environmental streamlining. It generally involves environmental review that runs concurrently with planning processes, utilizing interagency coordination, technologies, and communications tools to improve project delivery. In addition to potential project delivery improvements, environmental streamlining can include other benefits such as better decision making and enhanced inter-organizational relationships.

In order to respond to a crisis that began in the late 1990s – the discovery of a large population of failing bridges – the Oregon Department of Transportation (ODOT) developed the State Bridge Delivery Program (Bridge Program). This innovative program received multiple national awards in 2005: The Federal Highway Administration (FHWA) Environmental Excellence Award for Environmental Streamlining, which recognized the Bridge Program’s environmental stewardship, and The American Association of State Highway and Transportation Officials (AASHTO) Award for Best Practices in Context-Sensitive Solutions. In addition, the U.S. Fish and Wildlife Service (USFWS) Oregon State Ecological Services Division was honored with the USFWS Transportation Environmental Stewardship Excellence Award for its part in the Bridge Delivery Program.

This report examines the Bridge Program efforts undertaken, methods used, obstacles encountered, accomplishments, and lessons learned. It is not a performance evaluation; it is a case study focusing on the social, organizational and institutional dynamics of transforming a vision for environmental streamlining into a working program. The Bridge Program is complex as well as innovative. The report therefore emphasizes particular innovative aspects of the program, requiring significant collaborative relationships, rather than describing all program facets in detail.

Analyzing challenges and how they were overcome, as well as how innovations were achieved, is essential to understanding the particulars of how such a program succeeded and the ways in which the same elements might be replicated in other settings. The case study should therefore be of interest to practitioners, policy makers and academics interested in environmental streamlining and inter-organizational collaboration.

Based on case study interviews, there were nine significant lessons learned as a result of the process for developing and implementing the Bridge Program:

Take advantage of urgency to bring about change. Most programs and organizations achieve efficiencies by minimizing variation. They do so by adopting standard operating procedures and reinforcing organizational structures. Resulting inertia can therefore make significant changes difficult to initiate. A crisis often acts as a catalyst to facilitate changes. Oregon's bridge crisis forced ODOT and the other agencies to look for innovative ways to handle the workload.

Have a solid strategy for selling the program. Developing a winning sales strategy for green bridges and environmental streamlining probably helped obtain buy-in and secure funding both internally and externally. Emphasizing near-term, direct economic benefits while tying them to long-term, more indirect environmental benefits helped make the program attractive to those who had the authority to make it a reality such as agency executives, the Legislature, and potential partner agencies. The strategy can be important for agency 'inreach' as well.

Work with stakeholders and partners to create a shared vision. ODOT's first order of business outside the agency was to build a politically and technically viable program. This included bringing together, first, a full range of stakeholders, then the regulatory and resource agencies needed to help develop environmental streamlining. Displaying and discussing agencies' individual mission statements as a way to identify and build on the common ground of stewardship helped shift the nature of discussions and attitudes away from what would be acceptable under traditional, prescriptive permitting practices to how to go about developing outcome based standards that would help all agencies meet their regulatory requirements and meet organizational objectives.

Ensure leadership commitment at top levels. Personnel at the level often required to negotiate new procedures frequently feel they do not have the authority to be inventive, even though regulations may not prohibit different approaches. ODOT and its consultants helped agencies overcome this perspective by bringing executive-level staff together at the workshops to endorse the process; to signal that it was all right to collaborate in order to find new, more efficient ways of doing business; and to set up expectations that a workable program would emerge.

Involve entrepreneurial, well-regarded staff. It is critically important for those sending agency personnel into collaborative efforts to determine who has a solid understanding of the agency's mission and objectives, yet is also enterprising about seeing beyond traditional and insular approaches to problem solving. Home agency personnel who do not understand the purpose of a collaborative effort may call into question the organizational loyalty of those who sit at the negotiating table. It is therefore important that those selected as collaborative agents be staff who have a history with the home agency and are perceived as having solid core organizational values.

Develop an outcome-based outlook. There is no uniformly accepted definition of outcome-based project delivery. In general, however, an outcome-based approach moves away from the traditional focus on adhering to requirements in the various stages of project delivery and focuses instead on meeting required results. Allowing discretion to

determine the means of project design and implementation, as long as the ends meet rigorous performance standards, builds in greater flexibility for project delivery. It also provides the basis for developing programmatic permitting to meet regulatory agency goals.

Create a tiered process for negotiation. Much of the practical advice on collaboration includes developing processes for conflict resolution. The Oregon Bridge Program used an innovative, tiered strategy for dealing with uncertainty and potential disputes. Participants agreed that any issue representing an impasse would be tabled and elevated to the next management level among collaborating agencies. This approach allowed staff from the partner agencies to continue developing other parts of the program while issues in dispute or in need of clarification were being resolved at the appropriate management level.

Be aware of how language, learning, laws and norms may influence interactions. Those managing collaborative efforts need to be aware that differences in professional training, with subsequent divergence in language and problem solving approaches, can create friction. It is important to discuss these differences in order to resolve problems that may arise from misunderstandings and incorrect assumptions, which people from different professions may develop regarding collaborative partners.

Provide training and education, both externally and internally. Environmental streamlining that involves innovative approaches to project delivery such as outcome-based (performance) standards may be vague and confusing to agency staff and to project delivery employees such as designers and contractors. To increase efficiency and reduce the potential for permit violations, program managers should develop training for anyone who will be responsible for any segment of project delivery. Program development should include sufficient resources to develop an in-house educational plan with a consistent message that will reduce the inevitable doubts and misconceptions regarding program details and potential benefits.

The Bridge Program experience underscores the reality that creating innovative programs requiring extensive collaboration are more than technical and legal exercises. Building an effective process and structure for environmental streamlining is manifestly a social process that takes time, attention and flexibility. For those designing and managing environmental streamlining processes, in addition to understanding what technical, financial and other resources are needed, it will be important to understand the different social dynamics that affect perceptions and interactions both within and among partner organizations.

There are some unique factors regarding the Bridge Program that are important to keep in mind when considering its transferability to other settings.

The program received an unusually large sum of money for design and implementation. Unless the political will exists in other contexts to finance a similar program at the level needed, funding would be a barrier to replication. As an example for funding strategies, however, the Bridge Program provides two useful lessons:

1. Selling program funding to entities responsible for program appropriations by linking environmental stewardship actions to economic gains; and
2. Using department up-front funding to develop outcome based project delivery that has a high probability of at least being revenue neutral with the likelihood of delivering significant net savings over the life of a project or program.

Another aspect of the program that makes it unique is the direction from the Legislature to outsource program management and project delivery to encourage job creation. This framework can be useful to any other organization or political body contemplating outsourcing.

Different interviewees noted that the Bridge Program was a relatively easy one to get behind. As one called it, it was a 'white hat' program. The bridge structures were already in place; project objectives included enhancing the environment on already existing project sites; and no activities involved a significant commitment of previously undisturbed resources such as putting in a new highway access ramp or a runway extension. It was unclear to those same interviewees whether the program would be as workable in situations where new development would be taking place.

Many interviewees said they could envision other programs using the framework in whole or in part as appropriate. The particular strength of ODOT's Bridge Program framework is not just how it is changing the way ODOT does business, but its potential to serve as a template for other DOTs and even other agencies looking to improve environmental streamlining.

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LIST OF ACRONYMS AND TERMS

AASHTO	American Association of State Highway and Transportation Officials
BA	Biological Assessment
BLM	Bureau of Land Management
BO	Biological Opinion
CAA	Clean Air Act
CETAS	Collaborative Environmental and Transportation Agreement for Streamlining
CS ³	Context Sensitive and Sustainable Solutions
CSS	Context Sensitive Solutions
CWA	Clean Water Act
DEQ	(Oregon) Department of Environmental Quality
DFW	(Oregon) Department of Fish and Wildlife
DSL	Department of State Lands
EPA	Environmental Protection Agency
EPS	Environmental Performance Standards
ESA	Endangered Species Act
FHWA	Federal Highway Administration
MCBRT	Mitigation/Conservation Banking Review Team
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OBDP	Oregon Bridge Delivery Partners
OBDU	Oregon Bridge Delivery Unit
OBP	Oregon Bridge Program
ODOT	Oregon Department of Transportation
OTIA	Oregon Transportation Investment Act
PARIT	Project Agreement Reporting and Implementation Team
SAFETEA-LU	The Safe, Accountable, Flexible, Efficient Transportation Equity Act
Services	National Marine Fisheries Service and the US Fish and Wildlife Service
SHPO	(Oregon) State Historic Preservation Office
TEA-21	Transportation Equity Act for the 21st Century
TEPS	Threatened, Endangered, Proposed and Sensitive (species)
US ACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

Current transportation planning involves a variety of federal and state laws governing transportation projects as well as public expectations for participation and respect for the community context of transportation projects. Planning and project delivery requires collaborative networks comprising multiple agencies and levels of government, tribes, and a broad range of stakeholders to streamline permitting. This report examines an innovative program and network for environmental streamlining: The Oregon State Bridge Delivery Program (Bridge Program).

The Oregon Department of Transportation (ODOT) contracted with Oregon State University's Institute for Natural Resources to document the efforts undertaken, methods used, obstacles encountered, accomplishments, and lessons learned in the Bridge Program environmental streamlining effort. The following report covers the history and context as well as findings regarding institutional and organizational challenges and accomplishments.

Such collaborative, innovative efforts are potential prototypes for efforts elsewhere. Analyzing challenges and how they were overcome, as well as how innovations were achieved, is essential understanding the particulars of how such a program succeeded and the ways in which the same elements might be replicated in other settings. The case study should therefore be of interest to practitioners, policy makers and academics interested in environmental streamlining and inter-organizational collaboration.

It should be noted that this is not a performance evaluation of the effectiveness of ODOT's innovative approach to environmental streamlining through the Bridge Program. As stated above, the emphasis is on the social, organizational and institutional dynamics of transforming a vision for environmental streamlining into a working program. The program is complex as well as innovative. The report therefore emphasizes particular innovative aspects of the program requiring significant collaborative relationships rather than describing all program facets in detail.

2.0 THE CASE STUDY

2.1 BACKGROUND

ODOT has gone through several significant changes since the late 1990s: restructuring and decentralization; significant outsourcing for work that traditionally was carried out in-house; and re-elevating ODOT's Environmental Services to a freestanding Section, reflecting a greater attention to environmental strategies and requirements for transportation planning and projects. During this time, ODOT and its partners created the Oregon State Bridge Delivery Program. The program was needed to deal with a looming transportation infrastructure crisis and subsequent workload crisis for ODOT and for the network of state and federal agencies responsible for environmental review and permitting. The program garnered three awards in 2005. ODOT received The Federal Highway Administration (FHWA) Environmental Excellence Award for Environmental Streamlining, which recognized the Bridge Program's environmental stewardship, and the American Association of State Highway and Transportation Officials (AASHTO) award for Best Practices in Context-Sensitive Solutions. In addition, the U.S. Fish and Wildlife Service (USFWS) Oregon State Ecological Services division was honored with the USFWS Transportation Environmental Stewardship Excellence Award for its part in the Bridge Delivery Program.

2.2 METHODOLOGY

The unit of analysis for this case study was the State Bridge Delivery Program within ODOT. The purpose of the data gathering and analysis was to shed light on how the various partners worked together to develop the process and program.

The researchers took an inductive approach, conducting semi-structured interviews using open-ended questions. Selecting interview participants was purposive rather than random: potential interviewees were chosen because of their experience or involvement with the program. Since interview participants had different levels of involvement with the Bridge Program, not all questions were appropriate for all participants; therefore, it not possible to provide statistical analyses for responses.

Interviews were conducted between March and May 2006. A contact list comprising 42 potential participants was developed from documents and from recommendations by those who were interviewed early in the process. Thirty-one of those contacted scheduled interviews for a response rate of 74 percent. Interviews were conducted in-person or by telephone and lasted from 45 to 90 minutes. Using grounded theory conventions, interviews were transcribed and coded for patterns or similarities in responses in order to establish and add strength to findings. Where appropriate, information given by interviewees was further corroborated, or alternative explanations were developed, through examination of reports, media coverage, historical documents, academic materials and other sources.

Confidentiality is essential to this type of research to ensure that interviewees can freely express their opinions and perceptions. Where direct quotes are used, any language that might identify the person who made the statement has been removed.

Research based on methods other than random sampling increases the incidence of bias among interview respondents as they are more likely to have common perspectives and experiences. Purposive sampling was necessary to ensure that data collected and subsequent findings would be based on specific knowledge of the program. Care has been taken to identify and reduce bias in reporting and in presenting the findings by providing alternative views or explanations where appropriate.

The limitation most often associated with case study research within the more traditional research paradigm is its inability to be generalized, free of context, to larger populations. Insights from case study research provide a form of generalizability through the potential transfer of findings from one setting to another based on context similarities (*Gomm, Hammersley, and Foster 2000; Lincoln and Guba 2000; Stake 2000*). Examining the Bridge Program as a framework for actions and strategies that others may use in whole or in part in other settings is precisely the goal of this type of research.

3.0 TRANSPORTATION PLANNING AND ENVIRONMENTAL STREAMLINING

Transportation infrastructure plays a critical role in our mobility and economic well being. At the same time, however, it has significant environmental impacts. Avoiding or minimizing threats to and degradation of the natural environment and the pursuit of economic prosperity and growth, in which transportation plays a part, are often seen as inherently incompatible (*Forman, et al. 2003*). Surface transportation in the United States has evolved into a complex system of inter-governmental planning and management as society seeks to integrate these values. Two trends over the past several decades have created the current dynamics: increased mobility and population expansion with an increasing number of vehicles and increased infrastructure to transport goods, and a change in environmental consciousness and social values, ushering in passage of an unprecedented number of environmental policies, laws, and regulations (*Weiner 1999; Black 2003; Forman, et al. 2003*).

3.1 ROAD ECOLOGY AND CONTEXT SENSITIVE TRANSPORTATION PLANNING

As transportation needs changed over the 20th century, social values concerning the environment also changed. Following World War II, citizens' quality of life expectations expanded beyond material prosperity to include clean air and water. Changing values also included greater attention to the aesthetics and importance of natural settings (*Hays 1987*). As a result, environmentalism became more socially and politically influential beginning in the late 1960s and early 1970s.

Although the environmental movement flourished in the 1970s, transportation planning remained relatively unaffected by its concepts and practices during the same period (*Horan, Dittmar, and Jordan 1999*). By the latter part of the 20th century, however, critiques of transportation's environmental impacts had escalated, especially with the advent of concepts such as sustainability and growth management (*Meyer and Miller 2001*). Since the 1980s, the concept of road ecology, defined as "the intersection of organisms and the environment linked to roads and vehicles" (*Forman, et al. 2003*), has also increasingly shaped surface transportation planning. The Federal Highway Administration (FHWA) formally adopted a more active use of road ecology concepts in 1990 and again 1994 through two successive environmental policy statements (see *Federal Highway Administration 1994*).

The commitment marked a significant shift from a traditional policy of post-project environmental restoration to protecting and enhancing the environment as a fundamental aspect of FHWA activities (*Forman, et al. 2003*). In addition, the FHWA stated its intent to protect neighborhood and community social and cultural values; in essence, to embrace sustainability concepts by integrating social, economic, and environmental concerns. Another stated objective was collaboration with partners at different levels of government to integrate FHWA, National

Environmental Policy Act of 1969 (NEPA) and associated project development procedures (*Federal Highway Administration 1994*).

The policy is consistent with sustainability's interlinkage of environmental, economic and social or community concerns utilizing significant local stakeholder participation and collaborative problem solving (*Brick, Snow, and Van De Wetering 2001; McKinney and Harmon 2004; Wondolleck and Yaffee 2000; Weber 2003*). FHWA, AASHTO, state departments of transportation, and others have also begun to employ "context sensitive solutions" (CSS) for transportation planning. The practice is defined as a "collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility... that considers the total context within which a transportation improvement project will exist" (*Federal Highway Administration 2005*).

3.2 THE NATIONAL ENVIRONMENTAL POLICY ACT AND TRANSPORTATION PLANNING

NEPA was one of the most revolutionary changes in federal policy-making. It transformed the consideration of federal actions with the potential to alter the natural environment from fragmented, ad hoc decision making with narrow economic criteria to a comprehensive process also reflecting ecological values and social impacts (*Lindstrom and Smith 2001*).

Since its early administration, NEPA has attracted strong proponents and opponents. Those who support it do so because of the act's requirement to integrate environmental considerations and minimize environmental harm in agency planning processes and project implementation. On the other hand, various interests regard the act as a perceived obstacle to maximizing economic and efficiency goals (*Tripp and Alley 2004*).

Many states have adopted laws requiring agencies to assess potential impacts in advance of actions affecting the environment. In some instances, states have requirements referred to as "little NEPA" processes. Although the majority of transportation projects do not require detailed federal NEPA review (see, e.g., *Luther and Bearden 2003*), the combination of state and federal requirements adds substantial complexity to environmental review for project design and permitting.

3.3 ENVIRONMENTAL STREAMLINING

Environmental streamlining involves environmental review that runs concurrently with planning processes, utilizing interagency coordination, technologies, and communications tools to improve transportation project development. Similar to the term "sustainability," environmental streamlining is a somewhat fuzzy concept without a distinct, agreed upon definition. The Federal Highway Administration provides the following definition for its purposes:

"Environmental Streamlining and Stewardship requires transportation agencies to work together with natural, cultural, and historic resource agencies to establish realistic timeframes for the

environmental review of transportation projects. These agencies then need to work cooperatively to adhere to those timeframes, while they are protecting and enhancing the environment” (*Federal Highway Administration undated*).

ODOT defines environmental streamlining as consisting of the following components: consolidated permitting processes, project timeline reduction, increased project design predictability regarding permit terms and conditions, and reduced program costs (*Brindle 2004*).

3.3.1 Environmental streamlining at the federal level

The concept of consultation among agencies, holistic planning, and programmatic analysis are all aspects of NEPA and state NEPA-like processes that interconnect organizations. More often than not, however, NEPA planning efforts that could benefit from interagency collaboration have been ad hoc and uncoordinated (*Eccleston 2001*). Results often include interagency disputes, loss of opportunities for economic efficiencies, and permitting and project delays. The Transportation Equity Act for the 21st Century (TEA-21), enacted in 1998 acknowledges the potential for conflict and advises that environmental streamlining processes provide opportunities for dispute resolution. The FHWA Office of NEPA facilitation, in collaboration with the U.S. Institute for Environmental Conflict Resolution, has developed guidelines for interagency and intergovernmental conflict management and dispute resolution (*Federal Highway Administration 2002*).

Stakeholder observations regarding ineffective interagency cooperation on projects led to Congressional direction for environmental streamlining through TEA-21. The Act mandated environmental streamlining through Section 1309 provisions. The intent of the section comprised expedited delivery and cost savings on transportation projects involving the federal government while protecting environmental, cultural and historic resources consistent with NEPA guidelines (*Federal Highway Administration undated*). Executive Order 13274, signed in 2002, further strengthened direction for interagency coordination among different levels of government and tribes (*Bush 2002*). The Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU), signed into law in 2005, continues and refines the environmental streamlining framework (*Federal Highway Administration undated*).

Several federal laws and executive orders other than NEPA and the TEA-21 also had an important effect on the consideration of environmental factors in transportation infrastructure activities. Those include the Clean Water Act (CWA) Amendments of 1997; the Clean Air Act (CAA) Amendments of 1990, the Endangered Species Act (ESA); Title VI of the Civil Rights Act of 1964; and Executive Order 12898 of 1994 on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (*Amekudzi and Meyer 2005*).

3.3.2 Pre-Bridge Program environmental streamlining in Oregon

Similar to other states, The Oregon Department of Transportation (ODOT) developed a NEPA/404 Accord for streamlining in the early 1990s. The accord was updated and implemented in 1996 (*Ozawa and Dill 2005*). ODOT nevertheless still encountered issues with integrating NEPA requirements into its planning process.

Between the 1998 passage of TEA-21 and 2001, ODOT's project workload doubled (*Federal Highway Administration 2001*). The nature of many projects changed significantly with federal ESA listings of multiple populations of salmon and steelhead in the Northwest in the latter 1990s (*Jewett and Brinkman 1998*).

In an effort to improve NEPA review, federal and Oregon State transportation and environmental agencies entered into an agreement in 2001 establishing Oregon's Collaborative Environmental and Transportation Agreement for Streamlining (CETAS). CETAS comprises 11 agency representatives who meet monthly to, among other things, exchange information, work through a variety of issues regarding transportation projects, and monitor implementation of any CETAS agreements (*Ozawa and Dill 2005; Oregon Department of Transportation 2005*).

CETAS began work on a number of batched and programmatic permit agreements in 2002, prior to the advent of the Bridge Program. As part of its 2001 Charter, CETAS identified six streamlining objectives, which became known as CETAS' "six pillars"¹ Several of those objectives – such as developing an Environmental Management System (EMS), creating a habitat mitigation banking program, using GIS and GPS to map natural and cultural resources, expanding programmatic approvals, and providing training to ensure seamless performance by local governments and contractors – influenced Bridge Program policies and activities. (*Oregon Department of Transportation 2005*)

3.3.3 Research on environmental streamlining

Studies on the topic of environmental streamlining have tended to focus on delivery time and cost and the number of obstacles encountered during project development. The Louis Berger Group study (*2001*) analyzed historical transportation project data and established a baseline condition against which to evaluate future efforts to implement environmental streamlining initiatives within the NEPA process. Among other results, the study found that, based on data from the first 30 years of NEPA compliance, the typical length of time for preparing an environmental impact statement was three years (median value) or 3.6 years (mean value) (*Louis Berger Group 2001*).

The length of time it took to prepare environmental impact statements increased from 2.2 years in the 1970s to five years in the 1990s. The study also found differences in length of time based on several factors: geographic regions, the number of public meetings held, the number of agency meetings held, if Section 4(f) approval was required, and if a Section 404 permit was required, among other variables. Based on the mean completion time length of sample projects over the 30-year period, NEPA review accounted for approximately 28 percent of overall project development time (*Louis Berger Group 2001*).

The extent to which projects are delayed based on environmental reviews and permitting is mixed depending on how the issue is examined. In a survey of Texas Department of Transportation environmental and planning practitioners, environmental coordinators reported project delays were most often associated with wetland issues, Section 4(f) issues, and

¹ For more detail, see <http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/cetas.shtml>

historic/archeological issues. The most costly delays due to environmental issues occurred during the project construction phase (*Overman and Phillips 2001*).

On the other hand, in a study of 12 Oregon Department of Transportation highway projects, delays relating solely to environmental issues (e.g., endangered species listings, wetlands mitigation, etc.) were identified in one-third or fewer of the projects. Project size, scope, and complexity contributed to delays more often than the regulatory requirements of the environmental review process. For instance, the top two reasons found for delays were design changes and concerns raised by citizens and property owners. Though these sources of delay could be related to environmental issues, they may not involve regulatory permitting requirements. The next two factors that extended project timelines were found to be communication, staffing (including turnover), and funding problems. Moreover, analysis of the actual project timelines did not show that any of the environmental process variables were related to longer overall review periods (*Ozawa and Dill 2005*).

The studies reveal that there is no single formula for streamlining environmental planning and review processes. Doing so requires a variety of approaches and techniques that can be tailored for different needs and circumstances. The studies also emphasize the need to understand factors beyond those identified in TEA-21 that influence the process, such as each effort's specific goals, the political opportunities, and varying state and local planning and environmental policies and laws within which these efforts are positioned.

3.4 BENEFITS OF COLLABORATION AND ENVIRONMENTAL STREAMLINING

Studies have consistently cited improved decision making as a benefit of environmental streamlining (*Amekudzi and Meyer 2006; Bracaglia 2005a and b; Ozawa and Dill 2005*). Findings have indicated other benefits as well, such as improved relationships among transportation and natural resource agency staff, and between agencies and the public; more open and comprehensive discussions among agency participants; better understanding of different agencies' missions and perspectives; early consultation with resource agencies; and increased predictability regarding reviews (*Bracaglia 2005b*).

Achieving the benefits, however, incurs significant costs. Counter to the rationale that streamlining will save time and money, it does not necessarily produce immediate dollar and staff time efficiencies. Initial costs in both areas can be particularly high because of the learning curve involved. Organizations need to carry out particular strategies to enhance the potential of achieving environmental streamlining benefits. They include 1) early consultation among federal, state, and local government entities; 2) concurrent rather than sequential review of plans and projects; 3) stakeholder participation; and 4) adequate levels of information, funding, and staff for environmental review (*Bracaglia 2005a*).

3.5 BARRIERS TO COLLABORATION AND ENVIRONMENTAL STREAMLINING

Environmental streamlining should presumably reduce project delays, duplicated efforts, and the costs associated with environmental reviews. Results from what few case studies have been analyzed thus far are mixed (*Bracaglia 2005a*). Despite the normative, instrumental, and substantive arguments supporting environmental streamlining, various entities often encounter significant organizational and institutional barriers when developing the collaborative relationships needed for environmental streamlining.

Conflicting missions, policy and procedural inflexibility, inadequate resources – especially budget shortfalls – and lack of appropriate inter-organizational structures act as institutional constraints to collaborative efforts (*Yaffee 1999*). Fragmentation of authority and information adds to joint problem solving difficulties (*Yaffee 1997*). State and municipal transportation entities have reported that competing priorities, lack of suitable planning analysis tools, and lack of data constitute major obstacles to incorporating environmental considerations into planning (*Amekudzi and Meyer 2006*).

Organizational issues also affect collaborative abilities. An individual's identity with a particular organization's technology and culture may affect perception of what constitutes a problem as well as alternatives to solving it (*Termeer and Koppenjan 1997; Morgan 1997*). People from organizations with different, and possibly conflicting, objectives may not recognize that their needs are compatible with the needs of partner organizations regarding collaborative goals (*Alter and Hage 1993; Gray 1989; Alexander 1995*). For instance, personnel from resource management agencies responsible for protecting and enhancing habitats and species populations may be mistrustful or adversarial with personnel from agencies whose objectives include projects that disrupt aquatic and terrestrial habitats. They may not see any potential for mutual gains by working together. Of course, the mistrust is likely to run in both directions. Unless partners acknowledge their interdependence with regard to a problem, the inclination to protect turf and preserve autonomy can affect organizations' assessments that collaboration is a worthwhile venture (*Alter and Hage 1993; Thomas 2003; Bardach 1996; Wilson 1989*).

Integrating environmental considerations into planning is difficult due to the sequential nature of different environmental analyses throughout the decision making process (*Amekudzi and Meyer 2006*). Organizations have also run into problems with environmental streamlining due to inertia – the tendency to resist incorporating new strategies into traditional ways of carrying out operations (*Morgan 1997*). Inertia is not always internal; it may also result from external legal and fiscal constraints. The intent of NEPA is to encourage concurrent planning and environmental review in order to avoid or minimize environmental impacts. Many agencies, however, repeatedly tend to plan or design projects first and then undertake environmental review, at which point they often encounter regulatory agency or citizen objections leading to costly delays that may include court actions (*Amekudzi and Meyer 2006; Tripp and Alley 2004*).

4.0 HISTORY AND CONTEXT OF THE STATE BRIDGE DELIVERY PROGRAM

4.1 OREGON BRIDGES 1950s-2000: A LOOMING CRISIS

Oregon, typical of many states, underwent a rapid transportation development phase as the nation's interstate highway system developed during the late 1950s and early 1960s (*Oregon Department of Transportation 2003*). During that period, ODOT installed hundreds of concrete slab, beam and girder bridges. Compared to other states in the West, Oregon has an unusually high number of concrete slab, beam and girder bridges; other states have replaced many of them for different reasons (i.e., building codes for earthquakes in California). As Oregon's population grew, so did the number of vehicles using the state's roads and bridges. In addition, the freight truck weights also increased, adding stress to the transportation infrastructure.

Bridge cracks had been noted in ODOT inspections for a number of years; however, attention to the problem intensified in 2000 when two bridges in different parts of the state exhibited large working shear cracks (*Oregon Department of Transportation 2003*). In 2001, engineers discovered severe cracks in one of ODOT's bridges in the rural John Day area of central Oregon. Traffic was rerouted for bridge repair, causing a number of significant negative impacts on both those who needed to move goods to market, and on a small community on the detour route. City and county roads were not built to absorb the weight and traffic from trucks using an unapproved alternative to the 113-mile official detour (*Oregon Department of Transportation 2003*). After other bridges of the same construction showed similar impairment, ODOT conducted a thorough inventory of 487 bridges built between the 1940s and the 1960s (*Oregon Department of Transportation 2003*). The inventory was incorporated into its 2003 Economic and Bridge Options Report (Bridge Report).

By the Department's estimates, at the funding levels available around 2001-2002, approximately 30 percent of its bridges could be weight restricted by 2010. Ensuring the safety of the state's transportation system would not only breach its objective of efficiency, it would severely impact the state's economy.

The Bridge Report advocated funding for bridge replacement, commenting that repairs were unlikely to be cost effective over the long term. ODOT's traditional repair strategy was on an ad hoc, 'worst first' basis. To increase work and funding efficiency, a corridor-based strategy was recommended. The report set forth its strategy as part of 'a new way of doing business' (*Oregon Department of Transportation 2003*).

4.2 THE ‘OREGON WAY’ – ENVIRONMENT AND ECONOMY

When the environmental movement began in the late 1960s and early 1970s, Oregon put itself in the forefront with innovative legislation. Tom McCall, Oregon’s Republican governor who held the office from 1967-1975, had a strong conservation ethic. He used his office to raise awareness over rapid growth, pollution and other environmental issues affecting the state and proposed legislation to deal with growth issues. During his tenure, concerns over litter led to the 1971 enactment of the country’s first required bottle deposit law, otherwise known as Oregon’s “Bottle Bill”. With passage of Senate Bill 100 in 1973, Oregon adopted statewide land use planning standards in an effort to balance development and conservation. The standards, comprising 19 goals, were developed to help contain urban growth and protect Oregon’s forest, coastal and agricultural lands.

Although the traditional resource economic sectors – timber, fisheries, and agriculture – had played a significant role in the development of Oregon’s economy, the recession of the early 1980s marked the beginning of their decline (*Oregon Office of the Secretary of State 2006*). During the 1980s and 1990s, the state worked to develop new economic sectors to replace resource-based ones. The state chose to pursue a mixed manufacturing and marketing economy, with a particular emphasis on high technology. Despite the turnaround in the economy, rural Oregon counties were generally left out of the state’s growing high-tech sector, as it was centered around Portland’s three metropolitan counties. When the economic boom of the 1990s buckled, Oregon again experienced high unemployment (*Oregon Office of the Secretary of State 2006*). Other trends in Oregon’s economy made the bridge dilemma even more ominous.

The increasing economic importance of road transportation coupled with a serious economic downturn provided strong legislative incentive to fund bridge repair and to use the program as a jobs stimulus strategy. According to state economic records, over the 20 years between 1979 and 1998, Oregon had increasingly moved away from rail transportation to air and truck transport. The state had experienced a 48 percent increase in jobs in the private industry transportation sector in that same period. The report citing the trend stated, “With Oregon’s diverse economy and topography, it is important to keep all distribution points within the state connected” (*Conway 1999*). Although the report was issued before the cracked bridges emerged as a problem, it noted that ODOT’s major projects list for the upcoming three- to four-year period would focus on updating roads in various areas of the state to ensure transportation mobility.

Intersecting with road transportation’s increasingly important economic role, Oregon’s economy went through a serious recession beginning in late 2000. The downturn was estimated to be the fourth worst for the state since 1947 (*Ayre 2004*) despite a relatively mild recession at the national level (*Vander Vliet 2004*). Unemployment during 2003 peaked at over two points above the national average, reaching 8.5 percent at the high point. Oregon held the unfortunate distinction of leading the nation in unemployment rates each month from January to September of 2003 (*Ayre 2003*).

On top of other factors burdening Oregon’s economy beginning in 2001, projections for the State’s Public Employee Retirement System (PERS) indicated a shortfall of \$8.5 billion, diverting monies from state and local government programs and saddling taxpayers with

additional debt (*Associated Press 2001, 2002a*). The shortfall projection ballooned to over \$15 billion in 2002 (*Associated Press 2002b*). The gap was blamed on poor stock market performance and the way the system was set up, which led to public arousal and legislative reform efforts in 2003. Under the circumstances, creating more jobs in state government was likely considered a political “third rail” issue, despite the need for expanded personnel the Oregon Bridge Program would require.

4.3 LEGISLATION ESTABLISHING THE STATE BRIDGE PROGRAM

Similar to many states, over the last decade Oregon has faced a widening gap between the funds needed to maintain the state’s highway infrastructure and the availability of funds to pay for it. Though vehicle miles were increasing, the gas tax rate had not increased since 1993 (*OTIA Bridge Delivery Program 2005*).

In 2001, the Oregon Legislature passed House Bill 2142, also referred to as the Oregon Transportation Investment Act I (OTIA I). The act increased a number of driver and motor vehicle fees to secure \$400 million in bonds to finance a range of road infrastructure improvements. In 2002, OTIA II was passed thereby adding another \$100 million for additional work. Combined with matching funds from local government, OTIA I and OTIA II provided funding for 160 projects across Oregon aimed at increasing lane capacity, improving interchanges, repairing and replacing bridges and preserving road pavement (*OTIA Bridge Delivery Program 2005*).

In 2003, the state’s focus was turned toward the hundreds of aging concrete bridges, causing ODOT to impose weight restrictions. The Economic and Bridge Options Report, produced by ODOT with the trucking industry and other stakeholders, estimated that Oregon’s deteriorating bridges could cost the state more than 88,000 jobs and \$123 billion in lost productivity over the next 20 years if the situation were not rectified (*Oregon Department of Transportation 2003*).

The Oregon Legislature responded to this by passing House Bill 2041 in July 2003, which enacted OTIA III. The third phase of OTIA provides \$2.46 billion for Oregon transportation infrastructure over a 10-year period, including \$1.3 billion for repair or replacement of the state highway system’s aging bridges. The OTIA III State Bridge Delivery Program was promoted as serving a dual purpose: road infrastructure improvement and job creation (*Oregon Legislative Assembly 2003*). A budget note contained later, in House Bill 5077, directed ODOT to contract with a private-sector firm for program management and overall implementation of HB 2041 and to do so in a manner that would emphasize the ability of Oregon construction firms to bid on program construction projects (*OTIA Bridge Delivery Program 2005*).

4.4 ODOT: REORGANIZATION AND NEW DIRECTIONS

In the late 1990s and continuing into the new century, ODOT went through a number of changes. A legislative task force report issued in late 2000 made recommendations to decrease agency time spent on project review and environmental compliance by placing staff at regulatory agencies and increasing coordination among the department and review agencies. ODOT responded by placing liaisons in regulatory agencies consistent with TEA-21 Section 1309(e) and forming an intergovernmental, interagency group to carry out CETAS – the Collaborative Environmental and Transportation Agreement for Streamlining – discussed in Section 3.3.2 (*Ozawa and Dill 2005*).

The agency also went through reorganization in 2000. Part of this reorganization involved decentralization. Until the 2000 reorganization, the organization had been fairly centralized although it was slowly evolving toward a regional approach to increase work efficiencies and reduce intra-organizational friction. The move to greater regional authority was undertaken to provide better resources for on-time project delivery while still offering technical assistance through headquarters in Salem.

5.0 THE STATE BRIDGE DELIVERY PROGRAM

The State Bridge Delivery Program is a public-private effort to replace or repair the state's aging bridges and involves the ongoing collaboration of a number of state and federal agencies. At the beginning of the Program, 400 bridges were estimated to be in need of repair or replacement. The Bridge Program currently has 346 bridges that will be addressed in a staged process between the years of 2004 and 2011.² Aside from the move to a corridor approach, the program involves a number of innovative strategies created to streamline permitting and otherwise increase efficiencies.

5.1 CORRIDOR APPROACH AND STAGED CONSTRUCTION

As discussed elsewhere, the Bridge Delivery Program has taken a corridor approach to maintain freight and traffic mobility in contrast to traditional "worst first" project planning. The program is divided into five stages covering six major corridors, as shown in Figure 5.1:

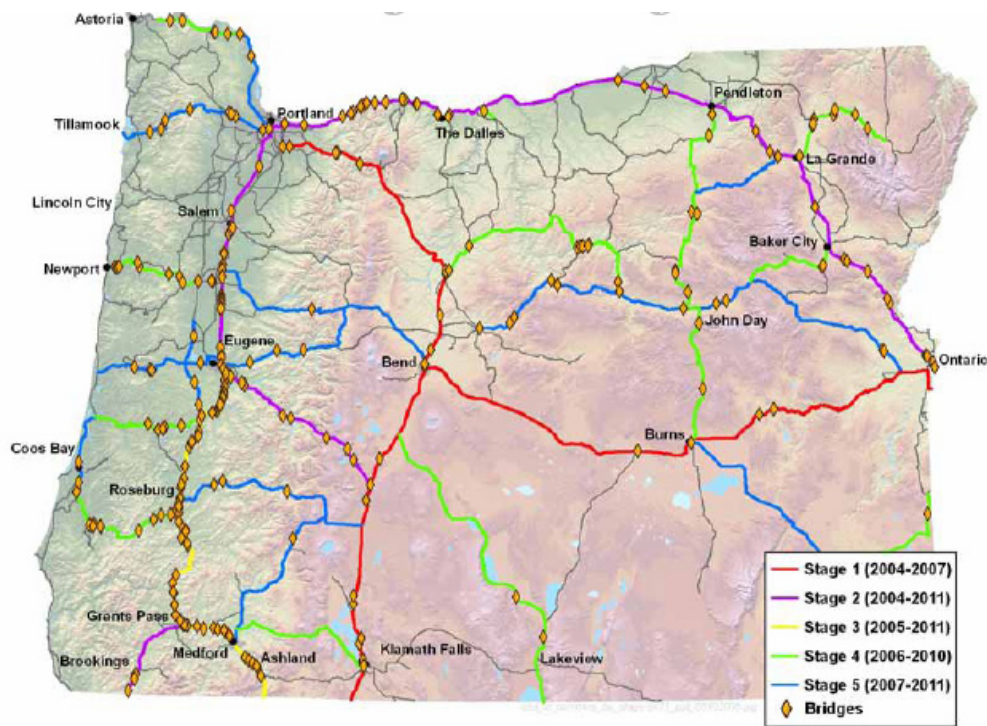


Figure 5.1: Map of program stages

² For more information on the specifics of each bridge, go to <http://www.obdp.org/program/work/stages/>.

Table 5.1 shows cost estimates for the five stages as of the date of this report. Details on the bridges in each stage can be found in Appendix A. As with any multi-year program, figures and projects may change over time.

Table 5.1: Five Bridge Program construction stages

Stage	# of Bridges	Total Budget	Current Estimate	# Under Design	# Under Construction
1	22	\$60,729,600	\$59,800,430	0	21
2	102	\$500,207,600	\$462,979,933	29	6
3	103	\$481,884,800	\$480,752,345	23	20
4	77	\$193,948,400	\$230,675,000	3	0
5	42	\$106,800,600	\$141,674,000	5	0
Totals	346**	\$1,343,571,000	\$1,375,881,708	60	47

**There were originally 365 bridges, but 19 have been changed to no-work.

Source: Oregon Department of Transportation 2005

Consistent with legislative directives and program commitments to stimulate the state’s economy, the Bridge Program has clustered, or “bundled” projects in order for in-state firms to successfully bid on them as well as to increase construction financial and time savings.

5.2 ORGANIZATION OF PROGRAM MANAGEMENT

In accordance with the OTIA III budget note, the Bridge Program management and delivery process is a public-private endeavor, moving the program away from traditional in-house oversight to a consultant-driven undertaking. The change is reflected in ODOT’s declaration that it “...is making an historic shift from an agency that produces engineering designs and construction to one that manages the statewide transportation system” (*OTIA Bridge Delivery Program 2005*).

According to ODOT, if the agency had carried out the OTIA III program on its own, it would have needed to hire approximately 600 new staff (*OTIA Bridge Delivery Program 2005*). Program management and oversight are unique. Although private enterprises are responsible for carrying out project design and delivery, ODOT is still accountable for the program. As a result of the OTIA III legislative intent and direction to stimulate the state’s economy through outsourcing, ODOT contracted with a newly formed Oregon company – the Oregon Bridge Delivery Partners (OBDP) – to manage and deliver the Bridge Program. ODOT also formed the Bridge Delivery Unit (BDU) to oversee the OBDP (*OTIA Bridge Delivery Program 2005*). As of the date of this report, the BDU had 24 staff. Thus the Bridge Program is governed by two entities – ODOT’s Bridge Delivery Unit (BDU) and the Oregon Bridge Delivery Partners (OBDP).

The Oregon Bridge Delivery Partners (OBDP) is a joint venture between HDR Engineering Inc. and Fluor Enterprises Inc., and functions as an extension of ODOT. Among other things, OBDP is responsible for the day-to-day management of the Bridge Program including the programmatic activities; the design-bid-build delivery contracts; and the management of the financial, engineering, environmental, and safety aspects of the program.

5.3 OREGON'S CONTEXT SENSITIVE AND SUSTAINABLE SOLUTIONS (CS³)

At the foundation of the Bridge Program is ODOT's Context Sensitive and Sustainable Solutions (CS³) Initiative. The program has its origin in the FHWA model of Context Sensitive Solutions (CSS), which began as the outgrowth of a 1998 conference "Thinking Beyond the Pavement." The concept comprises an interdisciplinary project approach utilizing broad stakeholder involvement to develop transportation features that fit their physical settings in ways that preserve scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility (*Federal Highway Administration 2005*).

Oregon's broader reach began with Executive Order EO-00-07 issued in 2000 by then-governor John Kitzhaber. The order, Development of a State Strategy Promoting Sustainability in Internal State Government Operations,³ directs state agencies to incorporate sustainability policies and programs into their operations. Subsequently, the state legislature passed HB 3948, the Oregon Sustainability Act, in 2001. Successor Governor Ted Kulongoski strengthened Oregon's move toward sustainability practices with Executive Order EO-03-03, "A Sustainable Oregon for the 21st Century" (*Sustainable Oregon 2006*).

With CSS as a basis and Oregon state government's commitment to sustainability, ODOT created its Context Sensitive and Sustainable Solutions (CS³) program, the first of its type among the nation's DOTs (*OTIA Bridge Delivery Program 2005*). The CS³ strategy for project delivery, which mutually benefits the economy, environment and communities, comprises five goals:

- Stimulate the economy
- Maintain freight mobility and keep traffic moving
- Employ efficient and cost-effective delivery practices
- Build projects that are sensitive to their communities and landscape
- Capitalize on funding opportunities

Details on the program, including performance measures for the five goals, can be found in the annual economic stimulus report and CS³ annual report at http://www.obdp.org/program/annual_reports/.

³ The order provides the following definition: "Sustainability means using, developing and protecting resources at a rate and in a manner that enables people to meet their current needs and also provides that future generations can meet their own needs. Sustainability requires simultaneously meeting environmental, economic and community needs" (*Sustainable Oregon 2006*)

5.4 “ONE PROCESS” PROGRAMMATIC PERMITTING STRATEGY

ODOT and its partners worked to reduce regulatory overlaps and increase environmental stewardship while reducing project design and delivery time and costs through the development of batched programmatic permits and agreements. Table 5.2 shows the Bridge Program Cooperating Agencies that have helped develop the environmental streamlining process.

Table 5.2: Bridge Program cooperating agencies

Federal Agencies	Oregon State Agencies
Federal Highway Administration	Department of Transportation
Environmental Protection Agency	Department of Environmental Quality
Army Corps of Engineers	Division of State Lands
U. S. Fish & Wildlife Service	Department of Fish & Wildlife
National Marine Fisheries Service	State Historic Preservation Office
U.S. Forest Service	
Bureau of Land Management	

ODOT and its agency partners developed a “one process” strategy to enhance compliance with regulatory requirements through the use of outcome based design criteria. Table 5.3 details the range of acts covered by “one process” programmatic permitting:

Table 5.3: Regulations covered by the “one process” programmatic permits

Federal Endangered Species Act	Bald Eagle Protection Act
Oregon Endangered Species Act	Coastal Zone Management Act
Fish and Wildlife Coordination Act	Oregon Removal/Fill Law
Migratory Bird Treaty Act	Marine Mammal Protection Act
Clean Water Act § 404	Magnuson-Stevens Fishery Conservation and Management Act
Clean Water Act § 401	National Environmental Policy Act
Clean Water Act § 402 (MS4 & 1200 – CA)	Wild and Scenic Rivers Act

Source: Brindle 2004

Current programmatic permits include:

- *Joint Biological Opinion* covering USFWS and NMFS covered species under the Endangered Species Act, applicable to specific bridges, which delineates allowed effects.
- *General Authorization/Region General Permit* covering other regulations such as the Coastal Zone Management Act and Clean Water Act Section 401 Certification involving fill and removal in wetlands and other waters.
- *Documented Categorical Exclusions (DCEs)* for NEPA compliance documenting engineering plans and assumptions and identifying potential environmental issues for each bridge site which require application of environmental performance standards.

- *Memorandum of Agreement with USFS and BLM* that established the FHWA as the lead agency for purposes of program activities involving agency management plans and various federal regulations.
- *Letter of Agreement with ODFW* outlining communication protocols and supporting the program's environmental performance standards consistent with the State of Oregon's Endangered Species Act.
- *Historic Context Statements* to assess and document historic resources, establish the significant of archeological resources, and determine appropriate actions regarding protection of those resources.

As the program evolves, ODOT anticipates developing additional programmatic permits.

Three particular innovations formed the basis for the “one process” programmatic permitting: environmental baseline reports, environmental performance standards, and a statewide mitigation and conservation banking program.

5.4.1 Environmental baseline reports

Major criticisms regarding environmental regulatory compliance include that it is time consuming, delays projects, and is costly. It was the perspective of ODOT's Environmental Section that such difficulties were not as much about the environmental regulatory requirements as they were about the right people not having the right environmental information early in the process. If good, thorough environmental information could be obtained much earlier and made readily accessible for decision making, cost overruns and schedule delays could be minimized or avoided while providing better environmental protection.

Based on this premise, ODOT hired Parametrix and Mason Bruce & Girard, consulting firms based in Portland, Oregon to conduct environmental assessments and produce maps of all bridges that were to be included in the Bridge Program. Environmental baseline data were collected for each bridge and bridge site in the OTIA III State Bridge Delivery Program. The purpose of the environmental assessments was to provide upfront, detailed descriptions about each bridge before bridge design and planning began. The baseline reports are descriptive in that they provide information about the environmental conditions at bridge sites along with preliminary indications of the environmental concerns, permits and approvals, and construction restrictions that may be in effect at those sites.

These assessments were aimed at developing better impact avoidance, identifying enhancement opportunities early, identifying permit needs early, supporting development of programmatic permits and a statewide mitigation program, supporting NEPA compliance, efficiency, and more accurate cost estimates and schedules (*Brindle 2004*).

5.4.2 Environmental performance standards

Unique to ODOT's programmatic permitting is a set of outcome-oriented environmental performance standards (EPSs) to guide project design and construction. This is a major departure

from traditional, threshold-based permitting. ODOT, with its consultants, first developed a set of best examples from other efforts and created new standards as necessary. ODOT, working with regulatory agencies and design and construction contractors as the “end users” then refined the standards to meet Bridge Program needs.

The EPSs are terms and conditions that define the acceptable level of effect that a project activity may have on the environment, rather than prescribing how the activity must be performed. The EPSs were a critical component of the jointly signed biological opinion. They require that contractors minimize unavoidable, short-term effects associated with a project and that restoration or mitigation actions be taken to offset unavoidable, long-term effects. It is also required that these actions not result in net long-term, adverse effects to listed species and their habitats (*Bonoff, et al. 2005*). Appendix B contains an overview of the Environmental Performance Standards.

In many instances, EPSs provide environmental benefits and enhancements above and beyond traditional requirements. The intent of the EPSs is to maximize the potential for short- and long-term beneficial effects to listed species, non-listed species, and their habitats. As contractors are fully aware of the terms and conditions of their projects before design and construction begin, the EPSs also give bridge design and construction contractors the flexibility to choose the most cost-effective method to preserve habitat at a particular site. The program also provides for a variance process, where appropriate, to further enhance project execution flexibility. Adaptive management has been incorporated into construction projects: implementing specifications are adaptively managed in order make them more effective and easier to administer. Bridge construction projects that do not conform with the EPSs are not covered under the regional general permit and the biological opinion and therefore require individual consultation under Section 7 of the ESA (*Bonoff, et al. 2005*). Collectively, the performance standards cover all phases of the program from administration to post-construction mitigation.

5.4.3 Comprehensive mitigation and conservation banking

ODOT’s traditional approach to mitigation – onsite mitigation on an acre-per-acre basis – left a good deal to be desired. The agency had been trying to develop a banking strategy for some time; however, perpetually tight project schedules with limited time and capital constrained opportunities to develop such a program.

As part of the Bridge Program, ODOT and its partner agencies were able to take advantage of financial and other resources to develop the Comprehensive Mitigation and Conservation Strategy (CMCS), which ODOT hopes to incorporate into its other programs. The intent of the mitigation and conservation banking program is to go beyond existing regulatory requirements for “no net loss” – avoiding or minimizing impacts to what may already be impaired conditions – to creating conditions which will facilitate species and ecosystem recovery across the state (*Oregon Department of Transportation 2006*).

The program will provide banking for all regulated resources affected by project delivery based on an ecoprovince priorities set of goals for each Oregon watershed rather than utilizing the traditional method of acre-for-acre, on-site mitigation. It also takes a non-traditional approach in that it mitigates for impacts to species, habitat and functions (e.g., wetlands, ESA recovery,

habitat and abiotic functions such as water quality), utilizing a multi-resource mitigation debit and credit system. The Mitigation and Conservation Bank Review Team (MCBRT), comprising state and federal agencies, signed an agreement that includes parameters for developing sites.

6.0 STRATEGIES TO BUILD TRUST AND DEVELOP THE PROGRAM

Innovation and good outcomes do not automatically follow good intentions. Vision is a critical first step, but it must be combined with the appropriate human, financial and technical resources. Timing of significant events can also influence success. Oregon's discovery of a large population of cracked bridges presented both a severe problem and an opportunity for creativity to meet the challenge. Different interviewees mentioned the fortuitous alignment of vision, funding, personalities, and streamlining efforts that had taken place prior to the Bridge Program, linked with a sense of urgency, as crucial to overcoming challenges and endowing the effort with its achievements to date.

6.1 ENTREPRENEURIAL LEADERSHIP

Interview participants for this case study repeatedly credited Lori Sundstrom, the Environmental Section Manager when events leading to the Bridge Program development took place, as the driving force behind many of the program's innovative strategies. Following the discovery of a population of cracked bridges, it was clear the workload within ODOT and among the state and federal agencies responsible for review and permitting was going to increase dramatically. Rather than employing a regional strategy, despite the fact ODOT had decentralized as part of its 2000 reorganization, the agency decided to carry out bridge replacement as a specific, independent program utilizing a corridor approach and setting up an internal unit to oversee program delivery. At the time the decisions were made, however, ODOT utilized the traditional process of designing a bridge and then making a series of modifications based on multiple agencies' feedback – a process that added substantially to project delivery time and cost.

When initially pursuing a programmatic approach to solving the cracked bridge problem, ODOT was looking at 191 concrete slab, beam, and girder bridges; however, they also began to talk about the number of other aging bridges in the system. The Oregon transportation system, like others throughout the U.S. has been built to different standards – federal standards for interstate highways and state standards for the state highway system. Different types of bridges therefore exist throughout the state's system. ODOT realized that, in addition to the initial 191 bridges, there was a significant population of bridges that would need repair or replacement within ten years. Though ten years may seem like a long time horizon, for the bridge program it represented a very short timeframe due to the lead time it would take to put together the necessary information about the bridges, decide what needed to be done, develop the program, find the funding, develop the designs, contract for the construction, and get the bridges built or replaced. In short, it could take several years before construction actually began.

When staff at a regulatory agency mentioned that, after dozens of biological opinions, all of ODOT's bridges were beginning to look alike, Sundstrom was struck by the comment: construction options were generally limited in terms of pier, deck and approach designs as well as construction materials; most bridge design work involved customizing a bridge to fit the

specifics of a given physical location. It therefore made sense to bring together the different review and permitting agencies and to find a way to incorporate everyone's legal and administrative requirements into a programmatic approach.

Taking a programmatic approach had the potential to reach two interlinked goals: (1) delivering bridges that interacted with the natural environment and historic or culturally significant features in ways that preserved or enhanced those resources; and (2) meeting transportation safety and efficiency objectives in a more timely manner than traditional project delivery. On the one hand, the Bridge Program represented a crisis for ODOT; on the other hand, it presented an exceptional opportunity to put road ecology theory and context sensitive design into practice. An interviewee talked about Sundstrom's strategy for creating buy-in:

[Lori] said, "Hey, we're trying to do this. How would you recommend it get done and how could I handle support for you?" She was trying to get everyone on board at the same time from the very beginning. She talked a lot with people before she did much of anything ...so everyone felt they had a stake in it from the very beginning.

6.2 A VISION OF GREEN BRIDGES

At the time the majority of Oregon's bridges were built in the 1940s through the 1960s, current environmental laws and regulations did not exist. Given the magnitude of the bridge repair and replacement programs, Lori Sundstrom and the ODOT environmental staff began promoting the replacement of the bridges as an opportunity to further express ODOT's commitment to environmental matters. This promotion came in the vision and concept of "green bridges" – designing and building bridges that not only maintain the quality of fish and wildlife habitat, but improve it. This concept of green bridges was clearly linked to Governor Ted Kulongoski's Executive Order No. EO-03-03, which focused on sustainability in Oregon. A requirement of the Executive Order was the enhancement and protection of the natural and built environments. This combination of ODOT initiative and executive mandate helped to increase buy-in among the leadership of Oregon's resource agencies to develop a programmatic approach to permitting for the bridge program (*Bonoff, et al. 2005*).

Consistent with sustainability and road ecology concepts, green transportation is a new way of thinking about project design. Green transportation design integrates environmental streamlining and market-based approaches that leaves the transportation system "better than before" by incorporating environmental design and stewardship principles. The Green Highways Initiative (<http://www.greenhighways.org>), for instance, specifies that its goal "...is to foster partnerships for improving upon the natural, built and social environmental conditions in a watershed, while sustaining life-cycle functional requirements of transportation infrastructure (safety, structural & service levels)..."

Many of the bridges in ODOT's OTIA III program were built before environmental considerations were a part of design. ODOT seized on an opportunity to work with its partners and consultants to develop environmental performance standards that would decrease the environmental impact of bridges and, in some cases, have beneficial effects.

Interviewees provided examples such as changing the placement of bents to prevent channel scouring and to restore more natural stream flows to benefit fish habitat. Redesigning the materials used between the structure and stream channel so that wildlife would be more likely to cross underneath the bridges may decrease animal-highway traffic accidents. Bridges are also being designed to act as roosting colonies for bats.

6.3 GETTING ODOT, STAKEHOLDER AND LEGISLATIVE BUY-IN

Other sections within ODOT had experience with environmental streamlining prior to the Bridge Program, but on a smaller scale. The combination of leadership and entrepreneurial thinking within the organization played a large part in internal support for scoping environmental, historic and cultural issues early in the project design phase for environmental streamlining on the scale needed for the Bridge Program. Framing the issue appropriately was also important. As one interviewee noted, “It wasn’t an environmental problem, it was a bridge transportation problem that had an environmental component that needed to be addressed.”

Developing the new approach for environmental streamlining required an up-front funding commitment within ODOT. Lori Sundstrom and members of the environmental staff at the time approached ODOT Director, Bruce Warner. He was open to suggestion, and the argument was persuasive: the traditional process, in which environmental considerations followed design, often involved substantial mitigation or avoidance expenses. For example, if a project negatively affected a wetland, ODOT would either have to build one or pay a resource agency to do so. There were clearly identifiable costs the agency would incur as a result of pursuing the customary approach. Based on preliminary calculations for the Bridge Program, using funds the agency anticipated spending anyway to design a programmatic process with performance standards would likely save ODOT money in the long run. The front-end funding would therefore be revenue neutral over the life of the program.

Securing funding and support among stakeholders and legislative figures required additional strategic marketing. An interviewee noted that linking the environmental benefits to the economic benefits was crucial to selling the program: enhancing environmental functions would speed up permitting; infrastructure could therefore be repaired or replaced more rapidly; and good infrastructure helped ensure a healthy economy.

6.4 GETTING PARTNER AGENCY BUY-IN: PROVIDING LIAISONS

A large population of deteriorating bridges represented a crisis not only for ODOT but also for review and permitting agencies. The situation provided the incentive for collaboration and program buy-in. Many, if not most, of the state and federal agencies that would have to evaluate bridge designs did not have the human resources available to handle permitting. ODOT had already taken advantage of TEA-21’s provision, permitting states to use federal highway monies to place dedicated staff at resource agencies for environmental review through CETAS, discussed below. State and federal liaisons worked at the Oregon State Office of Historic Preservation, the Oregon State Department of Lands, the U. S. Army Corps of Engineers, and the National Marine Fisheries Service (*Bearden 2002; Ozawa and Dill 2005*). New funding would

provide the financial resources necessary for additional liaisons needed to carry out the Bridge Program.

ODOT had developed intergovernmental agreements for placing liaisons at partner state and federal agencies prior to the Bridge Program. With added OTIA III funding to help with the increased workload, ODOT increased the number of funded positions to 14 to help agencies develop the documents and permits needed for environmental streamlining. As of 2005, funded positions were as shown in Table 6.1.

Table 6.1: Funded liaison positions as of 2005

Agency	Number
Oregon Department of Environmental Quality	2
Oregon Department of Fish and Wildlife	3
Oregon Department of State Lands	2
Oregon State Historic Preservation Office	1
U.S. Army Corps of Engineers	1
U.S. Fish and Wildlife Service	2
National Marine Fisheries Service	3

Source: CETAS Management Team, 2005

Various interviewees spoke of the critical role liaisons played in building trust and understanding and creating lines of communication between ODOT and partner agencies. One interviewee spoke of the liaisons as interagency ambassadors.

An interviewee remarked that liaisons are more than interagency coordinators. It is important that they understand the task and culture of the collaborative group. They need to carry that understanding back into their respective agencies to communicate with and perhaps gain buy-in from other agency staff not directly involved in the collaboration but whose knowledge and/or approval is important to moving collaborative tasks forward. Often it is someone with particular expertise regarding a regulatory act and its legal history or someone who has specialized knowledge regarding natural resources that might be impacted by project activities.

Among those interviewees that talked about the roles of the liaisons, there were also strong opinions about how important it is to select the right person with the right personality to serve in the position. One interviewee pointed out that a liaison needed to be someone with a history in an agency – someone who was well regarded as having the agency mission first and foremost when negotiating agreements with other agencies. Someone with less of a history might be regarded with suspicion as potentially ‘selling out the organization.’ On the other end of the spectrum, someone with a distinct and rigid agenda would not be a good choice. Overall, interviewees perceived that an effective liaison was someone who is entrepreneurial, flexible within the confines of the laws or regulations or resources their agency deals with, and able to think in big picture terms.

6.5 CETAS: A FOUNDATION FOR COLLABORATIVE RELATIONSHIPS

Various interviewees noted that the groundwork for interagency relationships needed for the Bridge Program was already in place as a result of Oregon’s Collaborative Environmental and Transportation Agreement on Streamlining (CETAS). CETAS, formed in 2001, comprises 11 state and federal agencies, shown in Table 6.2.

Table 6.2: CETAS agencies

Federal Agencies	Oregon State Agencies
Federal Highway Administration	Department of Transportation
Environmental Protection Agency	Department of Environmental Quality
Army Corps of Engineers	Division of State Lands
U. S. Fish & Wildlife Service	Department of Fish & Wildlife
National Marine Fisheries Service	Department of Land Conservation & Development
	State Historic Preservation Office

CETAS was formed to streamline ODOT projects involving NEPA review by involving agencies early in the process and improving interagency communication, cooperation and decision making. Although CETAS was formed to address NEPA processes, it has the flexibility of extending its collaborative process to other transportation projects (*Oregon Department of Transportation 2005; Ozawa and Dill 2005*). CETAS’ early work with the Bridge Program included developing state and federal agency agreements for programmatic and batched permitting (*CETAS Management Team 2005*).

CETAS’ charter included a conflict resolution procedure to elevate issues if staff came to an impasse. The process was modified and used in the Bridge Program as well. In each instance, the collaborative networks clearly anticipated the need for conflict resolution and made the commitment to resolve issues swiftly rather than allowing them to impede the group’s work.

Several interviewees mentioned that CETAS’ work had laid the foundation for positive Bridge Program interagency relations, smoothing over some historic antagonisms. Interviewees also suggested that, had it not been for the existence of CETAS, Bridge Program time constraints for developing programmatic permits might not have allowed for trust and relationships to form – collaborative dynamics critical to the Bridge Program’s success.

6.6 ESTABLISHING COMMON GROUND AND EXPECTATIONS: THE 2002 WORKSHOPS

To develop a programmatic approach and secure the commitment of the partners, it was determined that a programmatic permitting approach for the Bridge Program had to be efficient, legally defensible, simple (user-friendly), have a demonstrated commitment to environmental stewardship on the part of ODOT, and maintain collaborative relationships with the agencies. Developing a common vision and a commitment to the program among stakeholders and agency

partners would be crucial for creating mutual gains solutions in a short period of time, since program funding required a very large number of bridges to be replaced or repaired within a specified time frame.

In 2002 ODOT first brought together consultants and industry stakeholders to identify challenges to environmental permitting. After the initial meeting, ODOT determined it was critically important to hold a series of workshops to focus on different aspects of environmental design and streamlining such as NEPA, context-sensitive design, and natural resource and cultural resource issues. As one interview participant described the pre-workshop climate:

“...there was concern that maybe not everybody [had] the same understanding of what the [environmental permitting] process is, and it was amazing how different people’s understanding of what the process [was] even within ODOT – the different units of ODOT – and among the resource agencies. Everybody knew their own part, they just didn’t know how the parts fit into the whole...”

In late September and early October of 2002, ODOT brought together representatives from different ODOT sections, state and federal agencies, the governor’s office, consultant firms and construction businesses for its Bridge Strategy Workshops. The purpose of the workshops was to develop effective environmental streamlining in order to design a plan to deliver the very large number of bridge replacements and repairs in ways that would work better for everyone involved. The series of workshops became an opportunity to design a permitting process that would go beyond preventing bottlenecks – one that would incorporate environmental stewardship into streamlining.

The workshop was a forum to begin building improved relationships among agency partners. An interviewee recounted:

ODOT was sort of put in a difficult spot, and so they really needed streamlining...ODOT was coming into it knowing they needed all this regulatory work done. They didn’t want to go through the regular tit-for-tat kind of negotiation, so basically, they came in and said, “We want to do these bridges in an environmentally sensitive way. Tell us what you want us to do.”

There was nevertheless some skepticism due to historic tensions and mistrust between ODOT and some of the regulatory agencies. According to an interviewee:

“I think when it started out, there was some suspicion on the part of the resource agencies about the term ‘streamlining,’ that meant trying to make shortcuts around environmental protection.”

One of the workshop strategies to help build common ground and buy-in involved bringing in agency executives to support the effort in front of their staff to build a sense of ownership in the program and create expectations for thinking creatively. Another strategy involved explicating each partner agency’s mission.

Several interviewees talked about the process of identifying partner agency missions as an ‘aha’ experience for most of those in attendance. It was an opportunity for agencies to identify one

another's responsibilities; but it was also an occasion for partners to recognize and acknowledge that they had common ground – environmental protection and stewardship in one form or another. That realization in addition to the comprehension that the Bridge Program represented a crisis for everyone helped forge the necessary buy-in and open the door to productive dialogue.

Agency staff were encouraged to think beyond the process of denying or issuing permits under what had become institutionalized standard operating procedures and to think instead of how some creative negotiation – all within legal requirements – could accelerate permitting while improving environmental outcomes from project implementation. One interviewee spoke of agency personnel becoming committed to the Bridge Program as a superordinate goal in addition to their own missions as a result of the workshops.

Program development also had the imprimatur of executive staff from the partner agencies. An interviewee noted a traditional agency response to cooperative problem solving:

A lot of politics gets involved in these kinds of things, and when marching orders come down from the chain of command that you will hold the line on these particular things, and by hell or high water you're not going to move away from them, that's what you're going to do. Those are the people you're employed by, and you have no choice.

Several interviewees pointed out that having agency leaders' support is critical to collaborative efforts and noted that agency executives at the Bridge Strategies Workshop made it clear they endorsed the collaborative effort. Doing so sent a powerful message that the leaders from partner agencies all had expectations of success and that the marching orders were for cooperation.

A key to developing an outcome based permitting process was to raise consciousness about institutional inertia and move past it. One definition of institutions is “the sets of rules or conventions that govern the process of decision making, the people that make and execute these decisions, and the edifices created to carry out results” (*Gunderson, Holling, and Light 1995*). Often institutions take on a rule-like status and are so ingrained that those affected by them seldom question their origin or appropriateness to the task at hand. An interviewee described the phenomenon this way:

...after thirty or forty years of people applying these processes, all of a sudden they get solidified and the processes start taking on the same import as the law. Folks can forget that the processes are just put in place to comply with the law, but there is flexibility inherent in a law; there's flexibility inherent in process; or you can change the process completely and come up with something different completely and still meet the intent in the desired outcome of the law.

The process of developing outcome based permitting was time intensive; however, awareness of the latitude available within legal requirements made a big difference in terms of inter-organizational negotiations.

6.7 TIERED NEGOTIATION

It is not unusual for collaborative efforts to encounter conflict in some form. The conflict is often due to differences in organizational cultures and world views as well as differences in interpretations of applicable laws. The Bridge Program partner agencies and consultants knew that a process that involved multiple actors at different levels of government was likely to encounter impasses across a variety of issues. Thus they designed and implemented a tiered development team approach to handle the inevitable challenges. An interviewee talked about how much the tiered approach contributed to program achievement:

In order to establish the programmatic permits, we established multi-agency collaborative work groups and a three-level process for elevation and vetting of decisions. That was very, very successful.

Another interviewee indicated that the Bridge Program borrowed the tiered approach from the Forest Service and the Bureau of Land Management ESA Section 7 consultation processes. Several interview participants noted that elevating issues within those agencies was often perceived as failure – staff at lower levels were expected to work through impasses. The Bridge Program partners, however, made the decision that, if they encountered gridlock over any issue, they would elevate the matter as a positive step. As one interviewee explained it:

We had an agreement that we would elevate [issues in dispute], that we wouldn't let things fester ...[D]isagreement is not failure, disagreement just means disagreement.

Level 1 participants were responsible for developing the environmental performance standards and the programmatic biological assessment (BA). The group, which included representatives from various agencies along with consultants, met weekly. When certain issues could not be resolved in the Level 1 group, they were elevated to the Level 2 Reviewing Group comprised of senior staff at the federal fisheries agencies and ODOT. This group provided clarification and resolved conflicts. The Level 3 Executive Group, made up of state and regional directors of various agencies, could step in if needed to resolve policy conflicts and provide policy direction.

By all accounts, the tiered negotiation approach was a good one. Just knowing issues might be elevated sometimes provided the incentive to work through differences. At other times, using the system helped break through logjams as higher-level staff provided clarification and guidance. According to the interviews, no issues in dispute were elevated to Level 3. This may be viewed as a further indication that the tiered resolution strategy, plus having the right personalities involved, worked well.

An example of a situation that might require a tiered resolution process would be institutional norms regarding interpretation and enforcement of laws. Based on agency missions and cultures, it was sometimes the case that two agencies would carry out provisions of same law, such as the Endangered Species Act, in very different ways. Various interview participants spoke about the hesitancy Level I staff sometimes had regarding their authority to negotiate certain program requirements. In those instances, the Level II staff might confer with one another about the issue

in question and communicate to Level 1 whatever decision had been made and provide direction about how to proceed.

An interviewee spoke of how the process helped maintain critical working relationships:

[The process] required that there be regular, frequent check-ins between the Level 1 and Level 2 working team with the idea that the Level 1 group, if they get stuck on something that they just can't get around, you table that until you have that Level 2 review team so that you can address it, but the idea is to keep the momentum going, keep relationships undamaged in the Level 1 group, and have that regular report out ...we had maybe up to three executive meetings a year, that's a Level 3, basically here's what we've done, here's what we've come up with, you bless it, everything's good, we're going to move on. That worked fabulously for us, and we imposed that on any piece of this project where we needed to come up with something new.

Based on the number of interviewees who commented enthusiastically on the tiered review and conflict resolution process, the approach seemed to be a key to moving the program forward under significant time constraints.

6.8 THE ROLE OF COMMITTEES IN MAINTAINING COLLABORATIVE RELATIONSHIPS

Various committees within the program help maintain communication on issues as well as solve problems. The collaborative, interagency CETAS model likely had some influence on the formation of committees such as PARIT – the Programmatic Agreements Reporting and Implementation Team. PARIT is comprised of the liaisons from the agencies. The committee meets twice a month to work through various program issues, but it also helps, in the words of one interviewee, "...continue to meet the intent of all of the commitments we made during the two years or so during development." To strengthen this function, PARIT has established new tools and procedures to better track and monitor agency commitments.

The Mitigation and Conservation Bank Review Team (MCBRT) is another example of a set of state and agencies that were involved in program development coming together for joint agreement on an element of the program. Representatives from eight agencies – USFWS, EPA, FHWA, US ACE, NMFS, DSL, DEQ, and ODFW signed a mitigation banking agreement which contains parameters for the mitigation banking program. It does not, however, authorize individual banking sites. The MCBRT assists ODOT in its selection, design and certification of specific banking sites. The ongoing, collaborative interagency involvement assures that there is a common understanding and consensus regarding the procedures for certifying banks and reinforces the cooperative relationships among Bridge Program agency partners.

6.9 PUTTING THE RIGHT PEOPLE ON THE PROJECT

Different interview participants mentioned the importance of having ODOT personnel with vision and insight to create the foundation for the Bridge Program, as well as the good fortune to

have highly skilled and motivated people from the partner agencies in on the collaborative effort. One interviewee pointed out that it is equally important, when charting new territory, to involve those who have a history with the organization and are well known and trusted. Doing so removes concerns that the person at the negotiating table will compromise the organization, since people trust that the agency representative is well imbued with the organization's core values. This may present a dilemma, however: personnel who have been with an organization for a long time may hold entrenched perspectives that make them less than ideal candidates for the job of creating collaborative, innovative solutions.

Not everyone has an interest in innovation or the ability to think creatively. In some instances, the lack of interest and ability may come from a belief that tradition best serves the organization's purposes. Straying from standard operating procedures may be perceived as a threat to efficiency and accountability. In other instances, individuals with high ideals may believe that principles and deeply held values are at stake in pursuing new approaches, especially if they involve perceived tradeoffs.

This is not to dismiss the concerns and beliefs of people who feel they are protecting their organization's integrity or their professional credibility by maintaining tradition. For situations which call for collaborative innovation, however, it is important for organizations to identify competent professionals with a combination of organizational and regulatory knowledge, creative aptitude, and skills at bridging differences with other organizational cultures.

6.10 STRENGTHENING UNDERSTANDING AND COMPLIANCE THROUGH TRAINING

Despite agency commitments to environmental compliance, thorough information on what is expected does not always flow as well as desired to project construction practices. One interviewee described the problem this way:

[Compliance] was an area of huge criticism in the past by regulatory agencies. You spend two years developing a project and going through all of these agreements, and then [the project is] handed off to a contractor, and they forget half the agreements and go out and screw something up and nobody is there to tell them what's going on.

The communication and understanding breakdowns between ODOT and design or construction firms may have had a significant influence on the historical friction between ODOT and various regulatory agencies. To remedy the problem, the Bridge Program developed a robust environmental monitoring and compliance program, including thorough training for anyone who will be working with the environmental performance standards, as compliance with the performance standards assures compliance with the programmatic permits. OBDP provides training workshops for new ODOT employees, staff at regulatory agencies, architectural and engineering firms and construction firms.

7.0 CHALLENGES

ODOT and its partners, through collaborative problem solving, overcame a number of institutional and inter-organizational obstacles to produce an innovative program for transportation oriented environmental stewardship and environmental streamlining. The Bridge Program was designed to be highly adaptive: program performance will be monitored and changes made as needed to further increase efficiency and benefits.

As of the date of this report, implementation is still in its early stages. Aside from the technical challenges of moving from concept to practice, the interviews indicated that the program still faces a number of organizational and institutional challenges. In some instances, challenges reported in this section have been resolved; however, they are included, as the information may be significant to others wanting to design and implement an environmental streamlining program.

7.1 INTRA-ORGANIZATIONAL CHALLENGES

Building collaborative inter-organizational relationships could not solve some of the challenges of program design and implementation that were internal to ODOT. The organization has capitalized on Bridge Program characteristics as part of its move toward a “new way of doing business” – from an agency that delivers transportation projects to an agency that manages Oregon’s transportation system. The shift signals significant intraorganizational structural and cultural changes. Interviews indicated various intraorganizational issues that constitute current and possibly ongoing challenges for the Bridge Program and for expanding its approaches to project delivery into other areas of the organization.

7.1.1 Internal inertia and autonomy issues

Organizations have a tendency toward inertia, or resistance to change. While the characteristic carries negative baggage, it has a purpose: it provides organizations with stability, efficiency and accountability (*Morgan 1997*). The paradox for organizations is that stability, in the form of standard operating procedures, structure and culture, can lead to an inability to respond appropriately to changes in the operating/task environment for a variety of reasons.

ODOT’s Bridge Delivery Unit was created in order to expedite program design and problem solving. There appeared to be a perception among decision makers that the Bridge Program would be delayed if the staff in existing units or sections did not immediately buy into the approach. The combination of outsourcing and choice of Bridge Unit staff helped develop a rapid response to an urgent issue that required problem solving and project delivery well beyond traditional in-house procedures.

ODOT maintains that the Bridge Program is regarded as a pilot prototype and that elements of the program may be transferred to other ODOT projects. Regardless of the program’s success,

there is likely to be continued internal resistance, at least in the near term, for a number of reasons interviewees cited.

It appears that there is resistance to the program since, in the haste to develop the Bridge Program, many people in other work units were not consulted regarding their ideas or preferences. As a result, understanding and buy-in is low in other areas of the agency. Some personalities are simply not supportive of changing standard operating procedures under any circumstances. In those instances, buy-in is also low.

Outsourcing was reported as both demoralizing and threatening within the agency. The Bridge Program represents a process, along with the 2000 reorganization, that eliminated jobs within the organization and opened participation in project design and delivery to outsiders. The perception among those who feel threatened may be that it weakened organizational boundaries and integrity in terms of what the agency does and how the agency conducts its business (*Morgan 1997; Scott 2003*). As a result, accepting the program may be perceived as capitulating to changes that threaten the organization as well as individual security.

Interviewees spoke of outsourcing as diminishing the potential for various staff to maintain and add to their professional skills. Shifting design and project delivery to outside interests has a significant negative influence on employees who have joined an organization with the reasonable expectation that they will be able to maximize their professional training and add to their skills through their career. Interviewees further commented that outsourcing precipitates a skills drain within the organization.

Turf protection is also an issue. Various interviewees talked about the resistance to diffusing Bridge Program innovations into other parts of the agency as a “Don’t tell me how to do my job” response. Organizational goals and culture are not monolithic characteristics. Complex organizations often encounter friction at the interface of different divisions because of conflicting departmental objectives and worldviews (*Morgan 1997*). The notion of having a different unit’s procedures and worldviews being imposed on one’s own may be perceived as turf invasion and loss of autonomy. The action may also be perceived as a critical commentary on the competence of the unit or department being expected to adopt new procedures, especially if that unit has not been consulted regarding preferences and has not been provided convincing evidence of the benefits of adopting new practices.

7.1.2 The regions and crossover bridge projects

As the Bridge Program was originally envisioned, all bridges were to be delivered by a private-sector program management firm and the stand-alone ODOT Bridge Delivery Unit. At some point, however, it appears that an ODOT internal decision was made to allow the regions to design and build some OTIA III bridges in order to help designers in the regional offices gain experience and/or maintain skill levels. Since assigning some OTIA III bridge to regions would reduce the overall contract amounts going to private-sector businesses, the regions made up the contract differences by assigning some non-OTIA III projects to the Bridge Program.

This tradeoff had some apparent challenges. Since the bridge delivery process was designed without the regions being involved, understanding and ownership of the process appears to be

uneven. Furthermore, since the regions are under tight project schedules, there may be little time or interest in becoming familiar with the innovations of the Bridge Program, since up-front opportunity costs are high despite the potential for long-term improved efficiencies and savings.

It is unclear from interviews who has the ultimate authority regarding crossover project delivery. Since the projects involve OTIA III bridges, the Bridge Delivery Unit can demand that the developed process be used; however, the projects are technically the purview of the regions. If the regions do not adopt the same process and requirements developed for contractual relationships between ODOT and outsource firms, there is a risk that crossover bridge projects might violate the terms and conditions of the environmental performance standards and create friction between ODOT and the regulatory agencies that negotiated programmatic permitting specifically for OTIA III bridges. It should be made clear that, as of the time this case study was being conducted, there was no evidence that the foregoing situation had occurred. Different interviewees mentioned, however, that headquarters and the regions were still working out the relationships and terms of the crossover projects.

Much of the effort to help collaboration be successful – appropriately so – focuses on the interfaces among the various organizations engaged at joint problem solving. Attention to perceptions at various interfaces within collaborative partner agencies, however, is also important in terms of building knowledge and support.

Extensive education and “inreach” needs to be built into collaborative efforts to help develop understanding and reduce resistance. Although ODOT did, in fact, produce newsletters, e-mails and other intraorganizational communications, a more developed and deliberate internal education program might have helped personnel to better understand the potential benefits of Bridge Program innovations, thereby reducing resistance. An interviewee provided the following advice regarding education that could be helpful:

It’s a complicated program with a lot of goals and a lot of outcomes, and I think that [ODOT] could have done a better job, and needs to in the future do a better job, of having sound bite type talking points about “this is why we’re doing what we’re doing and this is what it’s about” so that people have less opportunity to be confused and hear the wrong thing.

7.2 CONTRACTING

Contracting issues were challenging during program development and continue to be during implementation, but for different reasons. Contracting is generally a technical and legal issue, but it often involves human dimensions that can be a significant barrier to innovation due to the changing nature of new program development.

During program design, contracting for outsourcing was difficult as the scope of work, deliverables, schedule – hence, the subsequent cost – were indeterminate. Those who review and approve contracts and those who want rapid contract approval typically have incongruent objectives. One group may view the other as obstructionist, while the other sees itself as protecting the organization against swindling (*Lurie 2004*). Negotiating and processing Bridge

Program contracts took a good deal of staff time and energy due to differing perspectives. While this may seem somewhat inconsequential in the larger scheme of things, it is an issue that can cause significant delays when time is of the essence, but program and project development needs to be highly adaptive and fluid.

Now that the Bridge Program has moved into implementation, contracting is an issue for different reasons. Although the program relies on a “one stop” process, the sheer volume of contracts that need to be processed can still result in bottlenecks. The implementation phase is still too new to make any judgment about whether this will be an ongoing issue or whether, given more time and practical application, it will be satisfactorily resolved.

7.3 LANGUAGE, TRAINING AND INSTITUTIONAL BARRIERS

When people with different world views, training, and objectives work with one another, there are bound to be language issues that need to be resolved. The Bridge Program is no exception. Some of the language issues are typical and obvious, while others may be less so.

A typical language concern developed between planning and implementation regarding environmental performance standards. The tight timeframe for program development did not leave time to test the language included in various standards, and different interviewees noted that interpretation issues have emerged among design firms, program managers and regulatory agencies. As with any project standard requiring exacting language, any ambiguity is likely to be fodder for disagreement. Given the adaptive nature of the program, it is likely these issues will be fairly readily resolved through negotiation and clarification.

Different professional training, and even different professional associations within a particular discipline, can constitute language barriers that have the potential to create friction (*Jasanoff 1990*). Sometimes these obstacles are less obvious than those of a technical nature.

One potential conflict, for example, may be between engineers and scientists. Engineers are generally trained to develop solutions in terms of definite outcomes within tolerances. Scientists are generally trained to define solutions in terms of potential outcomes that carry with them multiple uncertainties. One group may perceive that its professional training and judgment is being questioned unless there are mechanisms to raise consciousness about the issue and work through it (*Lurie 2004*). It is unclear whether similar issues appeared during Bridge Program development. The issue did not surface as described in interviews, although several interviewees mentioned long-standing antagonisms between biologists or other environmental regulators and engineers regarding bridge design. Nevertheless, the potential is high in collaborative efforts involving diverse professions that training and language differences may cause antagonisms that need to be explored and resolved.

Legal requirements can also create language issues that may need to be reconciled. While developing ODOT’s Bridge Program, staff from two different resource management agencies had to utilize terms such as ‘conservation’ and ‘mitigation’ with very specific legal meanings. Each could not simply adopt a different term, as any deviation was likely to create legal

problems. Negotiations took place on how to incorporate the terms into documents in ways that would satisfy both agencies' legal requirements.

Organizations' differing legal requirements and administrative development may create institutional barriers in terms of the geographic scale at which organizational problem solving takes place. Several interviewees spoke of how different individuals and different agencies may interpret laws such as the Endangered Species Act. One interviewee, however, pointed out an additional way in which responding to the act can create barriers. For instance, resource agencies concerned with aquatic species may be solving problems on a narrower basis or at a smaller scale than an agency concerned with terrestrial species covering, for instance, a million-acre range. Neither way may be entirely appropriate to the task at hand. While a smaller-scale view may be incomplete, a larger scale approach may miss important and unique effects at the project level. The mismatch of scales may need to be reconciled in order to satisfy agency requirements as well as program needs. Batched and programmatic permitting is a way to resolve the barrier of different scales, but it will likely take some negotiating. An interviewee provided this insight regarding how ODOT resolved the issue:

...where you have multiple agencies, make sure everyone agrees that everyone gets to put in a cross-section and how they are [analyzing] the problem if they're allowed to do it that way...you might find that, the more different ways you look at it, the better your answer's going to be...If there are multiple technical procedures involved because they're looking at different scales of the issue, then do it that way. Which is what [ODOT] did. [They] had ten or 12 different agencies on board, and they all did their analysis, and ...put them all together.

Being aware of when it is desirable to push partner organizations to be flexible in terms of rethinking taken-for-granted institutional procedures and how to be flexible in terms of integrating various agency needs helps reinforce trust and cooperative attitudes. An additional benefit is likely to be an improved work product.

7.4 TRUST: A COMPLEX RELATIONSHIP

There were differing perceptions about trust as a result of CETAS and the Bridge Program. It was evident from interviews that ODOT and partner agencies developed trust as a result of CETAS collaboration preceding the Bridge Program and that trust was further expanded through joint problem solving and negotiation during Bridge Program development. An interviewee recounted:

...before the Bridge Program came in, there were huge confrontations... Through those years leading up to the Bridge Program ...both sides had to learn what the other side's values were and what words meant what ...there were huge differences and trust issues that had to be worked through ...Slowly, the culture is changing on both sides of the coin.

Trust is nevertheless fragile and often tentative, especially where organizations have had uncooperative or hostile past relationships. An interviewee offered the following opinion regarding the tenuousness of the program's newfound trust:

...with the regulatory community, you have folks who care deeply about the resources under their charge... You've got a new group, particularly a transportation agency coming in saying we want to do it different. Well, they don't necessarily know that we care about the resources too. They're just figuring we're trying to build stuff. It's that trust issue... We can do a hundred of these things right. The one that we royally screw up will be the example that's held up forevermore. So we've got a huge responsibility to make sure we're actually following through on our commitments, that's going to take a lot of horsepower both inside and out.

People at different levels in cooperating organizations may have different incentives to extend or withhold trust based on perceptions of whether negotiation represents potential compromise to organizational objectives and professional integrity. The Bridge Program is subject to some subtle but lingering suspicions regarding both organizational loyalty and resource protection. Collaboration often produces wariness that colleagues might "go native" and begin to identify with traditional organizational enemies, thereby compromising the home organization's integrity (*Needleman and Needleman 1974; Lurie 2004*). An interviewee who wholeheartedly supported the Bridge Program collaboration observed:

...you're giving away the farm. That is what people in the agencies that don't understand the whole process look at it as. And, yes, there was quite a bit of that.

Despite any evidence that the phenomenon had occurred, some interviewees expressed concerns that liaisons might be subject to "capture" by the host agency. As a corollary, there were also expressions that it remains to be seen whether resources will be as well protected through outcome based standards as opposed to threshold standards. In both cases, more time will determine whether lingering trust issues are resolved or reinforced.

7.5 CREATING AND MAINTAINING COLLABORATIVE INSTITUTIONS

Maintaining momentum, agreements and knowledge about working together is often a challenge when developing new inter-organizational programs and processes, as longstanding institutions work against joint problem solving (*Bardach 1998; Wondolleck and Yaffee 2000; Thomas 2003*). Building a culture of collaboration and inculcating a sense of ownership of the process is not only a function of having the right leadership and personalities, but of experiential and institutional memory.

Several interviewees spoke about how turnover during program development often resulted in setbacks. New team members who had not been in at the beginning of the program did not have the appreciation and knowledge of what kinds of effort and negotiation had taken place and what implicit or explicit behavioral norms had been adopted. Sometimes slowdowns were a matter of bringing new people up to speed on the process of program development. At other times, knowledge was only one element; new program development staff members needed to be indoctrinated in the program's collaborative "rules of engagement." One interviewee captured the dilemma:

Half the battles we've fought are because we had a different person in the chair, and you had to bring somebody else up to speed with the whole program... [It's important] to have policy and process as spelled out as possible so that you've got something in writing, that you can hand to the next person, that captures all those understandings and assumptions and mutual agreements, etcetera, that have been in place. The challenge is that you're never going to get it perfect. Because, really, all work is done on an interpersonal basis, and it's all about relationships, and you can't really document relationships appropriately.

Institutionalizing collaborative efforts depends on factors such as time and structures, among other things (*Wondolleck and Yaffee 2000*). Now that the Bridge Program is in the implementation phase, some of the continuity issues that vexed the program during the design phase are less of a problem. An interviewee noted:

Once you have the agreement, and you have the process lined up, and you've got some interagency agreement that people have already signed and what have you, then it's codified. If you get a new body, you kind of bring it up to speed and say, "Look, this is where it says what your role is, this is what your responsibilities are, and this is what your predecessor agreed to and your agency agreed to, so this is just how it's going to be."

This is not to suggest those involved in collaborative processes should be sanguine about institutional protections. Changes in leadership in the organizational and political environment can erode collaborative attitudes and reduce critical resources during implementation despite signed agreements (*Lurie 2004*). As discussed elsewhere in this case study, legal developments and issues that affect trust can also influence collaborative efforts. Turnover in personnel within the implementing network of partners can produce the same problems experienced during program development. ODOT recognizes that fact and provides education and training aimed at maintaining program understanding and commitment.

8.0 LESSONS LEARNED AND CONCLUSIONS

An interviewee provided the following opinion regarding the future for environmental streamlining:

Streamlining is going to be the mantra whether we like it or not. Our budgets aren't going to get bigger; our staffs aren't going to get larger. We're going to have to figure out ways to be more efficient with our time, and if there are ways that we can do that, that also bring all these benefits, that makes a lot of sense.

With that in mind, there are a number of lessons and conclusions based on the Oregon Bridge Program experience that should be of interest to architects of similar efforts as well as to policymakers and scholars.

8.1 LESSONS LEARNED

When appropriate, interview participants were asked what advice they would give to someone interested in creating a similar program. Answers took different forms. Some responded with a point-by-point list while others talked generally about characteristics of the program.

Since the interviews were conducted in a semi-structured manner using open-ended questions rather than as a survey, no attempt was made to rank the responses and present lessons learned in some ordered form. Based on those comments and others that appeared elsewhere during interviews, it may be concluded that a successful environmental streamlining process needs to include the following aspects:

8.1.1 Take advantage of urgency to bring about change

Most programs and organizations achieve efficiencies by minimizing variation. They do so by adopting standard operating procedures and reinforcing organizational structures. Resulting inertia can therefore make significant changes difficult to initiate.

A crisis often acts as a catalyst to facilitate changes. Oregon's bridge crisis – hundreds of structures that would need to be weight restricted over a projected ten-year period, thereby threatening the state's economy and transportation efficiency – forced ODOT and the other agencies to look for innovative ways to handle the workload. The reality that permitting agencies would be overwhelmed by the sheer number of permits to be processed provided Bridge Program partners with an opportunity to think creatively about how to increase environmental stewardship to meet common objectives while streamlining the environmental permitting process.

8.1.2 Have a solid strategy for selling the program

Developing a winning sales strategy for green bridges and environmental streamlining probably helped obtain buy-in and secure funding both internally and externally. Emphasizing near-term,

direct economic benefits while tying them to long-term, more indirect environmental benefits helped make the program attractive to those who had the authority to make it a reality such as agency executives, the Legislature and potential partner agencies. This strategy can be important for agency ‘inreach’ as well, as discussed in section 7.1.2.

Oregon’s bridge crisis had obvious economic consequences. Heading off those consequences required considerably reducing the time involved in environmental permitting. Developing a program emphasizing environmental performance standards as a lever to assure faster permitting that could subsequently protect or benefit the economy, in addition to providing environmental benefits above and beyond traditional project requirements, made a strong case for support.

8.1.3 Work with stakeholders and partners to create a shared vision

ODOT’s first order of business outside the agency was to build a politically and technically viable program. This included bringing together a full range of stakeholders – transportation infrastructure users who would be affected by inaction and who would also be affected by program design. Stakeholders were asked to help frame the problem and provide input on potential solutions.

ODOT and FHWA then brought together regulatory and resource agencies needed to help develop environmental streamlining in its September-October 2002 workshops. One of the most important exercises, according to interview participants, was displaying and discussing agencies’ individual mission statements as a way to identify and build on the common ground of stewardship. Doing so helped shift the nature of discussions and attitudes away from what would be acceptable under traditional, prescriptive permitting practices to how to go about developing outcome based standards that would help all agencies meet their regulatory requirements and meet organizational objectives.

8.1.4 Ensure leadership commitment at top levels

Personnel at the level often required to negotiate new procedures frequently feel they do not have the authority to be inventive, even though regulations may not prohibit different approaches. This apprehension is understandable if non-executive staff are uncertain about attitudes higher up the chain of command.

ODOT and its consultants helped agencies overcome this perspective by bringing executive-level staff together at the workshops to endorse the process; to signal that it was all right to collaborate in order to find new, more efficient ways of doing business; and to set up expectations that a workable program would emerge. This helped create a sense of confidence and authorization among the staff who would be working together to create new procedures and standards.

8.1.5 Involve entrepreneurial, well-regarded staff

Not everyone who has good professional skills is a good “boundary spanner” – the sort who can appreciate the needs and perspectives of people from other organizations in ways that help create mutual gains solutions. It is critically important for those sending agency personnel into collaborative efforts to determine who has a solid understanding of the agency’s mission and

objectives, yet is also enterprising about seeing beyond traditional and insular approaches to problem solving.

Home agency personnel who do not understand the purpose of a collaborative effort may call into question the organizational loyalty of those who sit at the negotiating table. It is therefore important that those selected as collaborative agents be staff who have a history with the home agency and are perceived as having solid core organizational values.

8.1.6 Develop an outcome based outlook

There is no uniformly accepted definition of outcome based project delivery. In general, however, an outcome based approach moves away from the traditional focus on adhering to requirements in the various stages of project delivery and focuses instead on meeting required results. Allowing discretion to determine the means of project design and implementation, as long as the ends meet rigorous performance standards, builds in greater flexibility for project delivery. It also provides the basis for developing programmatic permitting to meet regulatory agency goals.

Working with different agencies to develop outcome based performance standards may be challenging. Staff typically handles permitting or project design in a set manner based on the assumption that standard operating procedures are a matter of rule rather than entrenched routine or custom. In other words, staff may believe there is no other permissible way to ensure project delivery that meets various requirements. It might help to talk with staff about how their agency's standard operating procedures acquired seemingly inviolable status as a way to open up discussion about creating greater flexibility in how project delivery is carried out.

8.1.7 Create a tiered process for negotiation

Much of the practical advice on collaboration includes developing processes for conflict resolution. Such processes often entail some sort of facilitated or mediated group work. Under the circumstances, a collaborative process may come to a halt while the matter in question is being resolved.

The Oregon Bridge Program used an innovative, tiered strategy for dealing with uncertainty and potential disputes. Participants agreed that any issue representing an impasse would be tabled and elevated to the next management level among collaborating agencies. This approach allowed staff from the partner agencies to continue developing other parts of the program while issues in dispute or in need of clarification were being resolved at the appropriate management level.

If participants can adopt the attitude that elevating issues is a move toward efficiency and not a sign of failure, a tiered issue resolution strategy can be highly effective.

8.1.8 Be aware of how language, learning, laws and norms may influence interactions

Those managing collaborative efforts need to be aware that differences in professional training, with subsequent divergence in language and problem solving approaches, can create friction. It is

important to discuss these differences in order to resolve problems that may arise from misunderstandings and incorrect assumptions, which people from different professions may develop regarding collaborative partners.

Agency institutional norms may also create roadblocks. Most legislation is purposely ambiguous as a result of political bargaining. Consequently, different agencies may interpret and enforce the same legislation in different ways. Negotiation will likely be required to reconcile disparate interpretations and implementation of the same laws.

In other cases, legally required language may hamper the ability of agency partners to collaborate in instances where standards include words with specific meanings. Negotiation will be needed to find ways to bridge differing legal language requirements.

8.1.9 Provide training and education, both externally and internally

Environmental streamlining that involves innovative approaches to project delivery such as outcome based (performance) standards may be vague and confusing to agency staff and to project delivery employees such as designers and contractors. To increase efficiency and reduce the potential for permit violations, program managers should develop training for anyone who will be responsible for any segment of project delivery.

New programs can be confusing and even threatening to agency personnel, contributing to resistance to their adoption. Program development should include sufficient resources to develop an in-house educational plan with a consistent message that will reduce the inevitable doubts and misconceptions regarding program details and potential benefits.

8.2 CONCLUSIONS

The intent of this case study was to cover the process for developing the Bridge Program, including efforts undertaken, methods used, obstacles encountered, accomplishments, and lessons learned. Documenting how the program moved from vision to implementation may help transfer elements of the program to other ODOT project delivery processes as well as help other organizations in other jurisdictions find ways to increase environmental streamlining efforts.

The Oregon Bridge Program experience echoes other studies, which found that environmental streamlining provides a variety of benefits:

- Enhanced decision making and improved relationships among transportation and natural resource agency staff;
- More open and comprehensive discussions among agency participants;
- Better understanding of different agencies' missions and perspectives;
- Earlier consultation with resource agencies; and
- Increased predictability regarding reviews.

The Bridge Program experience also demonstrates that several factors can influence collaborative success for environmental streamlining. Many characteristics are transferable to other interagency joint problem solving efforts.

- Timing – a significant event or series of events coupled with political resolve;
- A sense of urgency;
- Available resources;
- Incentives to participate among potential partners; and
- Leadership.

An interviewee provided the following caution:

One of your lead sentences for your whole document should be, “Great program. Don’t expect it to happen overnight.”

The foregoing points underscore the reality that creating innovative programs requiring extensive collaboration are more than technical and legal exercises. Building an effective process and structure for environmental streamlining is manifestly a social process. It is a process that takes time, attention and flexibility. For those designing and managing environmental streamlining processes, in addition to understanding what technical, financial and other resources are needed, it will be important to understand the different social dynamics that affect perceptions and interactions both within and among partner organizations.

There are some unique factors regarding the Bridge Program that are important to keep in mind when considering its transferability to other settings.

The program received an unusually large sum of money for design and implementation. Unless the political will exists in other contexts to finance a similar program at the level needed, funding would be a barrier to replication. As an example for funding strategies, however, the Bridge Program provides two useful lessons: 1) selling program funding to entities responsible for program appropriations by linking environmental stewardship actions to economic gains; and 2) using department up-front funding to develop outcome based project delivery that has a high probability of at least being revenue neutral with the likelihood of delivering significant net savings over the life of a project or program.

Another unique aspect of the program is the direction from the Legislature to outsource program management and project delivery to encourage job creation. The experience can be useful to any other organization or political body contemplating outsourcing.

Different interviewees noted that the Bridge Program was a relatively easy one to get behind – as one called it, a ‘white hat’ program. The structures were already in place; ODOT was talking about enhancing the environment on already existing project sites; and no program activities involved a significant commitment of previously undisturbed resources, such as putting in a new highway access ramp or a runway extension. It was unclear to those same interviewees that the program would be as workable in situations where new development would be taking place.

Many interviewees said they could envision other programs using the framework in whole or in part as appropriate. The particular strength of ODOT's Bridge Program framework is not just how it is changing the way ODOT does business, but its potential to serve as a template for other departments of transportation and even other agencies looking to improve environmental streamlining.

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APPENDICES

APPENDIX A: PROGRAM DELIVERY STAGES, 2004-2011

Stage 1 (2004-2007)

Stage 1 focuses on the routes from Klamath Falls to Portland via U.S. 97 and U.S. 26, and from Bend to Ontario via U.S. 20. Bridges along these corridors need to be open to heavy and over height / over width truck traffic to provide an alternate route during Stage 2 construction on the interstates.

Stage 1a is comprised of bridges that faced imminent restrictions. ODOT needed to replace or repair them in order to eliminate, or minimize, load-restricted postings while Stages 2 through 5 are being delivered. Some of these bridges have been replaced and others permanently repaired. The remainder have been temporarily repaired to avoid restrictions and then re-assigned to their original stages for completion.

Stage 2 (2004-2011)

Stage 2 is the largest stage both in funding and in the number of projects (see Figure 2, page 13). It addresses the bridges on two major passenger and freight routes in Oregon: Interstate 84 and the northern portion of Interstate 5 from the Washington border to the Eugene-Springfield area. Notable Stage 2 projects are the Snake River crossing on I-84 at Ontario and bridges in the Columbia River Gorge National Scenic Area.

Stage 3 (2005-2011)

Stage 3 includes stage bridges on southern I-5, from Eugene to the California border, addressing bridge improvements to a significant portion of a major freight and passenger traffic corridor.

Stage 4 (2006-2010)

Stage 4 includes replacements or rehabilitation of bridges on vital freight corridors connecting coastal communities to I-5 and I-84 as well as key north-south routes in eastern Oregon. This stage includes bridges in the coastal corridor north of Coos Bay and bridges in central and eastern Oregon.

Stage 5 (2007-2010)

Stage 5 addresses routes and connections for rural and remote areas within eastern and central Oregon and the coastal corridor south of Coos Bay. These include routes critical to passenger transportation and the transport of agricultural, timber, and aggregate products and loads of over 100,000 pounds.

APPENDIX B: GENERAL OVERVIEW OF THE ENVIRONMENTAL PERFORMANCE STANDARDS

Program administration

- describes the required content of the Pre-Construction Assessment (PCA)
- includes requirements for monitoring and reporting, program-management guidelines, environmental documentation, communication protocols, and variances

Species avoidance and adverse effect minimization

- consists of a comprehensive set of actions and measures required to avoid and minimize incidental take of listed fish, wildlife, and plant species resulting from construction activities

Habitat avoidance

- provides specific guidance to avoid and minimize adverse effects to natural stream and floodplain function by limiting streambank protection actions to those not expected to have long-term adverse effects on aquatic habitats.
- provides a wide range of approved bank-protection techniques for use individually, or in combination at a particular bridge site
- activities are restricted that may adversely affect nest trees of listed species (e.g., bald eagle, marbled murrelet, or northern spotted owl) and non-listed species

Water quality/quantity

- requires development of a pollution and erosion control plan which specifies measures to prevent delivery of contaminants, and containment of pollutants (including petroleum products, contaminated water, silt, welding slag, sandblasting abrasive, green concrete, or grout cured less than 24 hours) to contact any area within 150 feet of waters of the U.S. unless approved by the Services and the appropriate regulatory authorities
- requires that adverse effects resulting from changes to the quality and quantity of stormwater runoff be avoided or minimized for the life of the project
- protection of groundwater is also addressed

Site restoration

- requires renewal of habitat access, water quality, production of habitat elements, channel conditions, flows, watershed conditions, and other ecosystem processes that form and maintain productive habitats
- requires a site-restoration plan (including a five-year monitoring and maintenance plan)
- provides a detailed guidance and recommendations on the use of pesticides, fertilizers, streambank shaping, as well as recommended materials and methodologies to achieve site restoration, are presented in the Site Restoration EPS.

Compensatory mitigation

- effects that are not offset by site restoration must be addressed through compensatory mitigation
- requires that the Bridge Program meet the goal of no net loss of habitat function by offsetting unavoidable permanent and temporary adverse effects to habitats
- Fluvial
- is designed to allow normative physical processes within the stream-floodplain corridor
- requires that program bridges span the functional floodplain (determined as specified within this EPS)

Adapted from Bonoff et al., 2005

APPENDIX C: PRIMARY PROJECT DELIVERY METHODS

A project delivery process was created specifically for the Bridge Program and consists of two primary project delivery methods – design-bid-build and design-build. In the design-bid-build process, construction is bid and contracted separately from design; in the design-build delivery method, the designer and contractor work under a single contract with ODOT. Design-build projects follow a process similar to traditional design-bid-build, but since design and construction activities take place simultaneously there are fewer steps.

Table C-1: Steps in the Design-Bid-Build and the Design-Build processes

Design-Bid-Build	Design-Build
1. Bundle development	1. Bundle development
2. Scope refinement	2. Data collection
3. Assignment of design bundle	3. Request for qualifications
4. Project kick-off meeting	4. Request for proposal
5. Design acceptance package and design acceptance workshop	5. Proposal preparation
6. Progress plans	6. Select design-build team
7. Advance plans	7. Contract award
8. Final plans, specifications and estimates	8. Project kick-off
9. Pre-let period	9. Construction progress – 0 to 50 percent
10. Pre-construction meeting	10. Construction progress – 50 to 100 percent
11. Construction start	11. Project closeout
12. Construction progress	
13. Project closeout	

For more information on the project delivery process methods see <http://www.obdp.org/files/partner/cs3/cs3-guidebook.pdf>

As of December 2005, active and planned design-build contracts accounted for approximately 31 percent (\$407 million) of the bridge program’s value (ODOT, CS³ Guidebook, p. 32).

