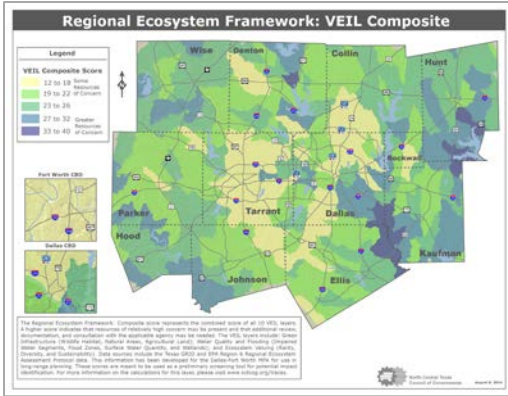


2013/2014 ECO-LOGICAL PROGRAM ANNUAL REPORT



December 2014

Prepared for:
U.S. Department of Transportation
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Prepared by:
U.S. Department of Transportation
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Executive Summary

This 2013/2014 Eco-Logical Program Annual Report reviews both the recent activities and successes of the Federal Highway Administration’s (FHWA) Eco-Logical Program, and examines the state of the practice of the Eco-Logical approach.

A key focus of this report is Implementing Eco-Logical, FHWA’s new initiative, in partnership with the American Association of State Highway and Transportation Officials (AASHTO) and the Transportation Research Board (TRB) under the Second Strategic Highway Research Program (SHRP2).¹ Implementing Eco-Logical includes an Implementation Assistance Program (IAP), which provided \$1.9 million in funding to State departments of transportation (State DOTs) and metropolitan planning organizations (MPOs) to engage in the Eco-Logical approach.² This annual report includes insights from IAP recipients as well as past recipients of FHWA’s Eco-Logical Grant Program to gauge applications of Eco-Logical across the country and identify areas where additional technical assistance may be needed.

Program Activity Since the 2012 Annual Report

In September 2012, FHWA, AASHTO, TRB, State DOTs, MPOs, and Federal resource and regulatory agencies convened a meeting to discuss Implementing Eco-Logical. The event created the Implementing Eco-Logical Implementation Plan, which listed a variety of activities and products to help encourage widespread adoption of Eco-Logical.

FHWA and AASHTO are actively developing and delivering the resources identified in the Implementing Eco-Logical Implementation Plan. Recent accomplishments include:

- Launched Implementing Eco-Logical IAP Spring 2013
- Organized AASHTO Executive Training Session Fall 2013
- Conducted a Business Readiness Evaluation Spring 2014
- Led Implementing Eco-Logical Sessions at AASHTO Committee Meetings Spring - Summer 2014

¹ SHRP2 is a large-scale cooperative research program funded by Congress and administered by FHWA, AASHTO, and TRB to advance innovative methods for the Nation’s highway system. The program’s projects, known as “SHRP2 Solutions,” are categorized under four focus areas: Safety, Renewal, Reliability, and Capacity. Implementing Eco-Logical, or C06, is one SHRP2 Solution listed under the Capacity focus area. For more on SHRP2, please visit the FHWA SHRP2 website at: <http://www.fhwa.dot.gov/goshrp2/>.

² The use of “IAP” in this report refers specifically to the Implementing Eco-Logical IAP as part of SHRP2 C06 activities.

What is Eco-Logical?

Eco-Logical is an approach designed to help transportation, resource, and regulatory agencies integrate their infrastructure development and conservation planning processes and arrive at a joint set of environmental priorities. The SHRP2 Implementing Eco-Logical initiative further tests applications of Eco-Logical among practitioner agencies. Implementing Eco-Logical activities include the IAP, which offered funding to State DOTs and MPOs.

State DOTs and MPOs are increasingly using elements of the Eco-Logical approach in their practices to engage partners early and facilitate streamlined environmental review, permitting, and transportation project delivery. These agencies are leading applications of Eco-Logical and demonstrating effective practices for using the approach.

- Founded the Implementing Eco-Logical On-Call Technical Assistance Team Ongoing
- Established a “Champions” Team to Promote Eco-Logical Ongoing
- Convened the FHWA/AASHTO Implementing Eco-Logical Team Ongoing

Current State of the Eco-Logical Practice

At present, there are approximately 25 States that have applied the Eco-Logical approach in some form. The majority of the applications occur at a regional level, rather than statewide. Through Implementing Eco-Logical, FHWA and AASHTO intend to continue to expand the number of States and MPOs using the Eco-Logical approach.

Early Formulation and Testing of Eco-Logical

Eco-Logical formally began at the Federal level in 2002, with the creation of an interagency steering team of eight Federal agencies and four State agencies. In 2006, the team jointly published [Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects](#). The document described the Eco-Logical approach, a process designed to help agencies collaborate to integrate infrastructure and ecosystem considerations in their infrastructure and conservation planning, and project delivery processes. During this time period, only a few States, including Montana, were also testing Eco-Logical approaches on the ground, to better understand how these approaches might be useful in their infrastructure planning and delivery.

To test the Eco-Logical approach and encourage awareness and adoption among transportation and resource agencies, FHWA established its [Eco-Logical Grant Program](#) in 2007. The program funded 15 projects across the country in ten different States, and one six-State U.S. Environmental Protection Agency region. During this time, additional States began programs that related closely to the Eco-Logical approach, including: the Vermont [Staying Connected Initiative](#) and the [Maryland Watershed Resources Registry](#). Though FHWA did not track these efforts as part of its Eco-Logical Program, it documented many of these practices through its [State Practices Database](#).

Through SHRP2 research, additional areas of the country were asked to pilot test the Eco-Logical approach as outlined through C06 A and B, through the SHRP2 Solution C21. Subsequently, during the implementation of the SHRP2 Implementing Eco-Logical initiative, the Implementing Eco-Logical IAP provided awards to a total of 13 State DOTs and MPOs that are actively pursuing Eco-Logical. These recipient agencies are using their SHRP2 funding to leverage existing knowledge and applications of Eco-Logical, collaborate with partners, use and share data, and streamline practices.

2014 AASHTO Questionnaire

In addition, as part of the SHRP2 Implementing Eco-Logical initiative, AASHTO sent a questionnaire to all State DOTs and MPOs to understand the current level of implementation of the Eco-Logical approach across the country. The majority of the responders had previously or were currently implementing the Eco-Logical approach in their programs. Some of the new responders were working with an agency that had established an Eco-Logical program (Michigan, Missouri). Others had heard of the opportunity from other AASHTO or FHWA communication and were interested in learning more about it (Arizona, South Carolina).

Key Findings and Recommendations

Recommendations for Agencies Interested in Applying Eco-Logical

Past Eco-Logical grant recipients and current IAP recipients cited many of the same challenges and successes—the importance of partnerships and stakeholder coordination, the obstacles and benefits of formalizing partnerships and sharing data, and the opportunities for promoting Eco-Logical—that continue to play important roles in the IAP projects. The report’s findings fall into four key categories. These findings and the IAP and grant recipients’ insights are the basis for recommendations to agencies wanting to explore the Eco-Logical approach (Table 1):

Table 1: Annual Report Key Categories and Findings

Category	Findings	Recommendations to Agencies
Establishing Diverse Partnerships, Interagency Coordination, and Stakeholder Buy-in	<ul style="list-style-type: none"> • Long-term implementation of an Eco-Logical project frequently depends upon the partnerships established under the project and the extent to which agencies can leverage these partnerships to pursue new collaborative efforts. • Advancing the Eco-Logical approach among partner agencies requires ongoing education and outreach efforts by grant and IAP recipients. 	<ul style="list-style-type: none"> • Leverage existing relationships with partner agencies. • Support ongoing promotion, outreach, and education related to the Eco-Logical project and approach.
Developing Data-Sharing Strategies and Protocols	<ul style="list-style-type: none"> • Agencies use informal collaboration and memoranda of understanding (MOUs) to overcome legal issues and sensitivity concerns surrounding data sharing. • Developing standard interagency templates can help overcome technical issues related to data quality, which often complicate the process of sharing data between agencies. 	<ul style="list-style-type: none"> • Work closely with partners to troubleshoot technical and data sensitivity issues and identify agreed-upon strategies. • Establish a data-sharing template when working across multiple agencies.
Communicating the Eco-Logical Approach Effectively	<ul style="list-style-type: none"> • Messages that target the specific benefits Eco-Logical can bring to a particular stakeholder group are more likely to encourage the group’s buy-in for the approach. • Agencies continue to face challenges in quantitatively measuring the benefits of Eco-Logical and in making a “business case” based on cost, time, and other savings measures. 	<ul style="list-style-type: none"> • Develop tailored messages to explain how Eco-Logical relates to a particular stakeholder group and demonstrate the specific benefits it brings to the group. • When possible, use in-person stakeholder meetings and external facilitators to engage stakeholders and encourage information-sharing.
Integrating Eco-Logical into Agency Practices	<ul style="list-style-type: none"> • Staff “champions” at the project level are key initiators for integrating Eco-Logical into an agency’s practices. • Existing “Eco-Logical”-like activities within an agency may not be formally associated with FHWA’s Eco-Logical Program but still promote similar activities, offering an opportunity for future research. • Eco-Logical’s connections to infrastructure besides transportation present opportunities to integrate Eco-Logical into innovative elements of agencies’ practices and to engage new infrastructure agency partners. 	<ul style="list-style-type: none"> • Consider a “bottom-up” approach to engage staff “champions” and encourage leadership support. • Identify existing agency programs that may have connections to FHWA’s Eco-Logical Program and incorporate them into future Eco-Logical activities. • Look for opportunities to advance the Eco-Logical approach beyond the transportation sector.

Recommendations for the Implementing Eco-Logical Program

The findings of this report will inform FHWA and AASHTO's Implementing Eco-Logical efforts and the broader FHWA Eco-Logical Program to further encourage applications of the Eco-Logical approach. Recommendations noted in this report for FHWA and AASHTO consideration as part of Implementing Eco-Logical include:

- Develop promotional materials and web resources that can help explain the Eco-Logical approach and/or Regional Ecosystem Framework (REF) to partners or stakeholders unfamiliar with Eco-Logical;
- Share existing materials on topics such as conservation or transportation planning processes or mitigation banking to educate Eco-Logical stakeholders;
- Create a list of the specific benefits Eco-Logical can bring to different stakeholder groups; and
- Offer best practice examples of Memoranda of Agreement and MOUs between transportation and resource agencies (e.g., data-sharing agreements, agreements related to best management practices).

Recommendations for Future Eco-Logical Technical Assistance Opportunities

Lastly, this report offers recommendations for various activities that FHWA should pursue under its Eco-Logical Program. In some cases, recommended activities may already be underway. Recommendations offered in this report are as follows:

- Design a process framework for engaging resource agencies, interdisciplinary stakeholders, and other partners throughout the Eco-Logical approach;
- Prepare an online tutorial or other introductory tool for Eco-Logical, outside of the AASHTO/FHWA starter kit³ currently underway;
- Encourage access to existing materials on legal and financing practices for mitigation banking;
- Offer best practice case studies⁴ focused on integrating Eco-Logical into formal projects or processes, such as mitigation plans;
- Demonstrate strategies for building accountability into the Eco-Logical approach⁵ and tracking the success of a REF or other Eco-Logical products; and
- Create materials that help agencies identify "Eco-Logical"-like activities in their existing practices and leverage these to reflect FHWA's Eco-Logical Program.

³ AASHTO is currently developing an Eco-Logical starter kit, in partnership with FHWA. The starter kit will be an online resource for agencies interested in applying the Eco-Logical approach.

⁴ FHWA is currently pursuing the development of various case studies highlighting on-the-ground examples of Eco-Logical.

⁵ FHWA, with support from the John A. Volpe National Transportation Systems Center, previously developed a preliminary Eco-Logical benefits framework to demonstrate examples of the cost- and time-savings the Eco-Logical approach can provide. Deployment of this framework will help agencies encourage a "business case" for Eco-Logical.

Introduction

The Eco-Logical Annual Report

The 2013/2014 Eco-Logical Program Annual Report introduces the Second Strategic Highway Research Program (SHRP2) Implementing Eco-Logical initiative led by the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) and shares updates on the program's recent achievements. One of the completed activities under Implementing Eco-Logical is an Implementation Assistance Program (IAP), which offered \$1.9 million in SHRP2 funding to 13 State departments of transportation (State DOTs) and metropolitan planning organizations (MPOs).

The report also:

- Summarizes the accomplishments and challenges of the IAP recipients;
- Assesses the current state of the practice of Eco-Logical;
- Analyzes perspectives from the IAP recipients and past recipients of FHWA's Eco-Logical Grant Program to identify best practices that can help other transportation and resource agencies effectively implement Eco-Logical in their own activities; and
- Presents considerations for future FHWA technical assistance and research activities.

Since 2009, FHWA has released annual reports on its Eco-Logical Program to communicate the state of the practice of the Eco-Logical approach. Past annual reports focused on FHWA's Eco-Logical Grant Program and presented findings and lessons learned from the 15 original grant recipients for calendar years 2009 to 2012.⁶ The reports presented insights, best practices, and status updates for the grant projects, and included recommendations and guidance on implementing the Eco-Logical approach from the recipients on topics such as tools, partnership strategies, and organizational adoption.

This section introduces the approach used for the 2013/2014 annual report and provides an overview of the Eco-Logical approach, which set the foundation for Implementing Eco-Logical. Subsequent sections of the report describe program accomplishments for Implementing Eco-Logical, the funded IAP projects and their performance goals, insights from the IAP projects as well as from the grant projects, and next steps for FHWA's Eco-Logical Program.

The Eco-Logical Approach

In 2006, an interagency steering team of eight Federal and four State agencies recognized the potential benefits of integrating infrastructure and ecosystem considerations in the jointly published document,

⁶ To learn more about past Eco-Logical Program annual reports, please visit FHWA's Eco-Logical [website](#).

[Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects](#) (Eco-Logical).⁷ The publication outlined the **Eco-Logical approach**, a process designed to help transportation, resource, and regulatory agencies integrate their infrastructure development and conservation planning processes, arrive at a joint set of environmental priorities, and then use those priorities to make and implement infrastructure and conservation decisions.

Eco-Logical articulates a vision that endorses ecosystem-based avoidance, minimization, and mitigation through integrating data, plans, design, and reviews across agency and disciplinary boundaries. The approach values ecosystem-based mitigation to enhance environmental outcomes as part of an efficient process for developing infrastructure projects and promotes conservation and sustainable use.

The FHWA Eco-Logical Program, through the SHRP2 Implementing Eco-Logical IAP funding and past Eco-Logical grants, helps State DOTs and MPOs apply the Eco-Logical approach and realize tangible improvements to transportation projects and processes. Further Implementing Eco-Logical efforts will provide direct assistance, support, and resources to agencies using this approach.

Methodology

This 2013/2014 annual report presents the progress and current status of Implementing Eco-Logical activities through summer 2014. To track and manage these activities, FHWA and AASHTO regularly coordinate through frequent check-ins and biweekly meetings to share updates and discuss deliverables. Information presented in this report is based upon these FHWA-AASHTO status tracking activities.

This annual report also assesses the current state of the practice of Eco-Logical, based in part from information collected as part of an AASHTO questionnaire and updates shared by the IAP and grant recipients.

In April 2014, AASHTO began a business readiness evaluation effort to better understand how State DOTs and MPOs were applying the Eco-Logical approach across the country. AASHTO circulated an online questionnaire to collect feedback from State DOTs and MPOs. Upon concluding the feedback period, AASHTO evaluated the responses received and held follow-up discussions with respondents to obtain additional information about their needs and challenges in using Eco-Logical.

This 2013/2014 annual report also provides updates on the projects funded through the Implementing Eco-Logical IAP and presents applicable updates and findings from the completed Eco-Logical Grant Program projects. In summer 2013, FHWA and the John A. Volpe National Transportation Systems Center (Volpe Center) project team held kick-off calls with the 13 IAP recipients to identify performance measure(s) to track the progress of each IAP project. FHWA provided examples of possible measures and also encouraged recipients to identify their own project-specific measures. The measures represent targets and milestones and are meant to help FHWA and the IAP recipients monitor the progress of

⁷ The interagency steering team comprised eight Federal agencies: U.S. Army Corps of Engineers, Bureau of Land Management, U.S. Environmental Protection Agency, FHWA, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, and National Park Service. These agencies are known as the “Signatory Agencies.” Four State agencies served on the team: Knik Arm Bridge and Tool Authority, North Carolina DOT, Vermont Agency of Transportation, and the Washington State DOT. The Volpe Center also provided support to the team.

individual projects and better understand the Eco-Logical approach in action. The measures also allow FHWA to identify any challenges or needed resources and match those with technical assistance resources available through the FHWA Eco-Logical Program.

The performance measures served as the basis for semi-annual progress reports submitted by recipients in winter 2013. In May and June 2014, FHWA and the Volpe Center project team held 60-minute telephone discussions with the IAP recipients to collect updates on the measures and project status (the interview questions are available in Appendix C). The team also used supplemental information provided by recipients, including stakeholder meeting notes, project websites and tools, and draft and completed deliverables, to inform their analysis.

In addition, the team gathered information from the grant recipients via electronic questionnaire to better understand how their Eco-Logical grant projects continue to influence their organizations. The brief questionnaire asked grant recipients about their perspectives on using the Eco-Logical approach and how their participation in the Eco-Logical Grant Program impacted their agencies' current activities or practices. Nine of the 15 grant recipients completed the electronic Grant Program questionnaire, which is provided in Appendix D.⁸

Together, the information gathered from the FHWA-AASHTO Implementing Eco-Logical status tracking activities and collected from AASHTO business readiness evaluation and the IAP and grant recipients present a comprehensive look at how agencies are applying Eco-Logical at the national, State, regional, and local levels. This 2013/2014 annual report offers examples of completed and upcoming Implementing Eco-Logical activities and demonstrates successes and challenges faced by the IAP and past grant recipients to date. In doing so, the report presents an overview of the state of the practice of Eco-Logical, evaluating its benefits and identifying areas for future potential research.

⁸ Two of the Eco-Logical Grant Program recipients are current IAP recipients and therefore participated in an IAP recipient discussion with FHWA and the Volpe Center instead of the Grant Program questionnaire.

Implementing Eco-Logical

Introduction to Implementing Eco-Logical

Implementing Eco-Logical began as a joint research project among FHWA, AASHTO, and the Transportation Research Board (TRB) under SHRP2 to operationalize the Eco-Logical approach. FHWA and AASHTO currently lead implementation activities for Implementing Eco-Logical.

Connections to SHRP2

SHRP2 is a large-scale cooperative research program funded by Congress and administered by FHWA in coordination with AASHTO and TRB. The program launched more than 100 research projects to address the most pressing needs of the Nation's highway system. Known as "SHRP2 Solutions," the projects advance innovative methods in the areas of Safety, Renewal, Reliability, and Capacity.⁹ Implementing Eco-Logical, or C06, is one SHRP2 Solution listed under the Capacity focus area.

FHWA, AASHTO, and TRB work collaboratively to advance SHRP2. TRB administered the research phase of SHRP2. FHWA, in partnership with AASHTO, serves as the primary implementation entity for delivering technical assistance and implementation activities. FHWA and AASHTO are collaborating to deploy the initial research products, including Implementing Eco-Logical.

Goals

In September 2012, a panel of experts representing FHWA, AASHTO, TRB, State DOTs, MPOs, and Federal resource and regulatory agencies met during a SHRP2 Implementation Planning Workshop. The output of this workshop was an Implementation Plan. The Implementation Plan set forth goals for Implementing Eco-Logical and defined resources for encouraging implementation of the Eco-Logical approach nationwide.

The goals of Implementing Eco-Logical are to:

1. Promote **widespread awareness and understanding** of the Eco-Logical approach among transportation, environmental, and conservation professionals, particularly State DOTs and MPOs.
2. Establish Eco-Logical as a **cost-effective and efficient way** of responding to the Nation's transportation needs.
3. Increase awareness of the **tools and resources** available to aid in adoption of Eco-Logical.
4. Provide **champions/advocates and partners** with support tools, evidence, and data to communicate with their peers about the benefits of Eco-Logical.
5. **Support State DOTs and MPOs** in the early stages of Eco-Logical to advance their agencies' objectives.

⁹ For more on SHRP2, please visit the FHWA SHRP2 website at: <http://www.fhwa.dot.gov/goshrp2/>.

Context in FHWA's Eco-Logical Program

FHWA's Eco-Logical Program has a long-standing history of supporting agencies in implementing the Eco-Logical principles, through the FHWA Eco-Logical Grant Program, the Implementing Eco-Logical IAP, and other related initiatives.

The Implementing Eco-Logical initiative builds on FHWA's Eco-Logical Program by offering an [Integrated Eco-Logical Conservation and Transportation Planning Framework](#) (IEF) for integrating infrastructure development activities across agency and political boundaries and identifying a region's ecological priorities. The nine-step IEF includes developing a [Regional Ecosystem Framework](#) (REF) to help agencies integrate conservation strategies with transportation and land-use data and plans (Figure 1).

Figure 2 further demonstrates how Eco-Logical activities over the years fit together.

Figure 1: The nine steps of the IEF. Step 3 focuses on establishing a REF, a resource that agencies can develop to help them implement Eco-Logical.

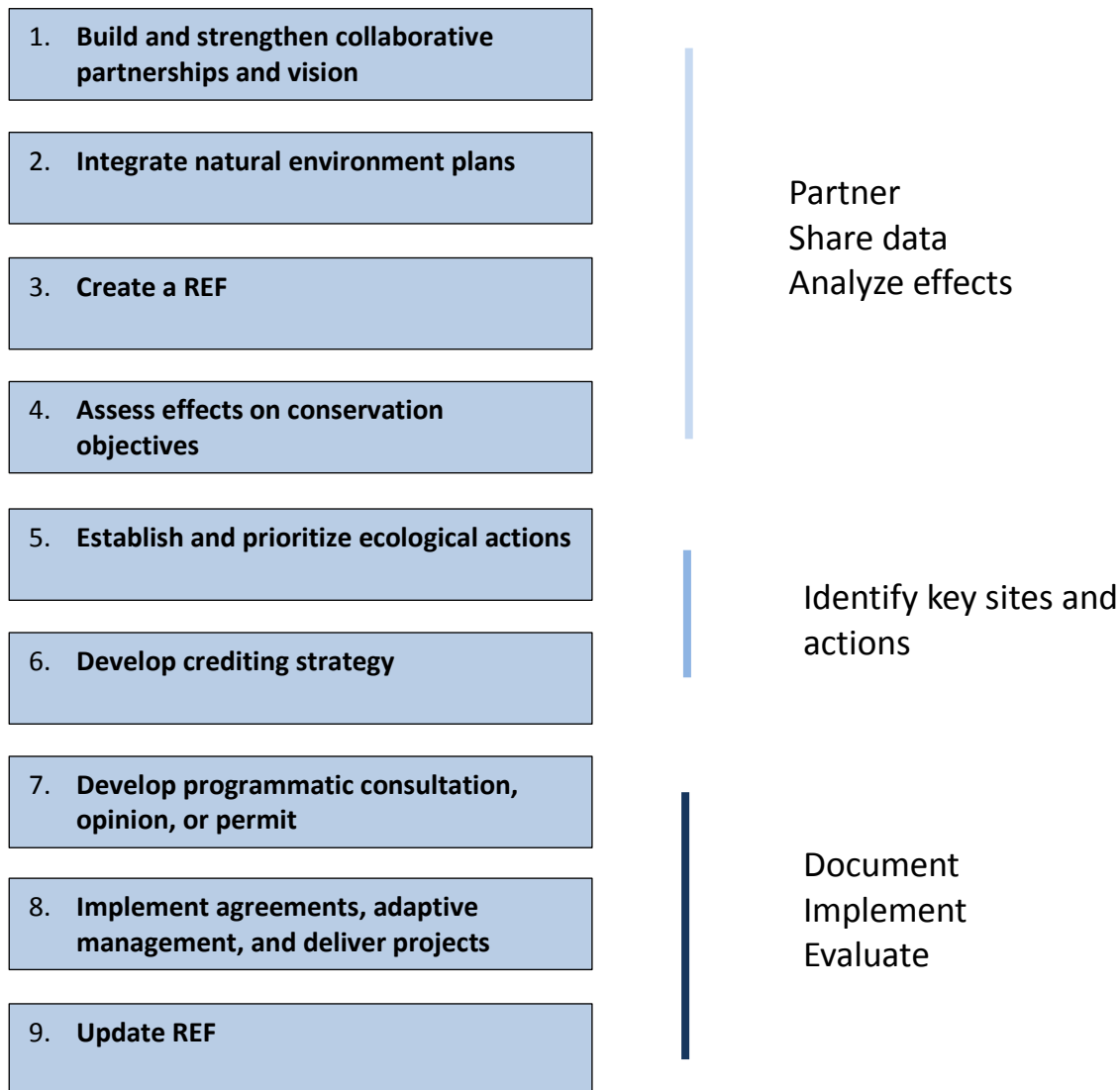
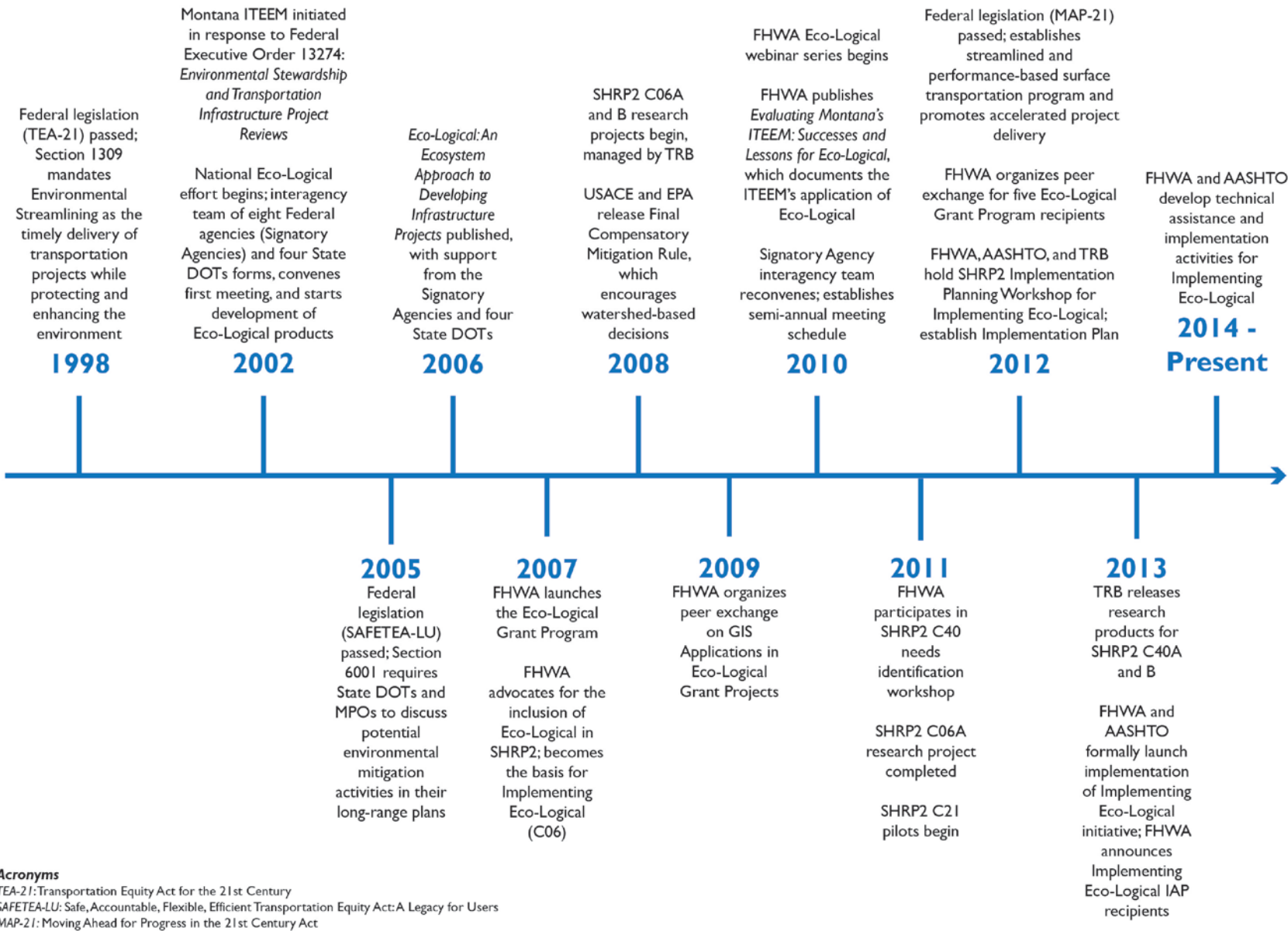


Figure 2: A Timeline of Eco-Logical. FHWA’s Eco-Logical Program has a long-standing history of supporting an ecosystem-based approach for infrastructure projects. FHWA and AASHTO currently lead activities to bring technical assistance to practitioner agencies implementing Eco-Logical.



Acronyms

TEA-21: Transportation Equity Act for the 21st Century
 SAFETEA-LU: Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
 MAP-21: Moving Ahead for Progress in the 21st Century Act

ITEEM: Integrated Transportation and Ecological Enhancements for Montana

For information on the SHRP2 products listed (C06, C21, C40), please visit: <http://www.fhwa.dot.gov/goshrp2/Solutions/Capacity/List>

Implementing Eco-Logical Program Accomplishments

Strategies and Products

The Implementing Eco-Logical Implementation Plan includes a range of activities and products to help encourage widespread adoption of Eco-Logical.

The products include:

- **Implementing Eco-Logical IAP** – Awards funding to State DOTs and MPOs to help them adopt Eco-Logical principles in their activities.
- **Starter Kit** – Includes web-based materials (e.g., training materials, best practices, benefits/costs approach, contact resources, and online information) to assist State DOTs and MPOs in initiating the early steps of Eco-Logical within their organizations.
- **Practitioner Handbook** – Introduces approaches to implementing Eco-Logical in a simplified format consistent with existing AASHTO Center for Environmental Excellence handbooks.¹⁰
- **Peer Exchanges and Workshops** – Provide opportunities for targeted exchanges and trainings to bring together multiple stakeholders to discuss topics related to implementing an Eco-Logical approach.
- **Other Training, Technical Assistance, and Outreach Resources** – Address the needs voiced by practitioners to help integrate the Eco-Logical approach into agency practices.

Accomplishments

In early 2013, FHWA and AASHTO began implementing the various strategies and products identified under the Implementing Eco-Logical Implementation Plan. Since 2013, FHWA and AASHTO have been active in advancing these activities to further promote the use of Eco-Logical across the country.

To date, FHWA and AASHTO have accomplished the following:

- **Launched Implementing Eco-Logical IAP (Spring 2013)**
In 2013, FHWA awarded SHRP2 funding to 13 recipients to implement the Eco-Logical approach through the Implementing Eco-Logical IAP. [Section 3](#) of this report provides information about the IAP recipients and examples of their performance milestones achieved to date.
- **Organized AASHTO Executive Training Session (Fall 2013)**
In October 2013, AASHTO developed and led a training session for State DOT leadership at the AASHTO annual meeting. The training, targeted to executive-level leaders and management, focused on awareness of the Eco-Logical approach, the benefits of the approach for streamlining project delivery, and upcoming opportunities for technical assistance.
- **Conducted a Business Readiness Evaluation (Spring 2014)**
In April 2014, AASHTO conducted a webinar and an online questionnaire to assess the level of adoption of the Eco-Logical approach by State DOTs and MPOs and the readiness of these agencies to implement

¹⁰ For more information on AASHTO practitioner handbooks, please visit:
http://www.environment.transportation.org/center/products_programs/practitioners_handbooks.aspx.

Eco-Logical. After receiving the results of the questionnaire, AASHTO held follow-up interviews with respondents to better understand agencies' needs and challenges in applying the Eco-Logical approach and potential opportunities for encouraging its use. AASHTO's business readiness evaluation provides a baseline for identifying national training needs and developing future technical assistance for Implementing Eco-Logical, particularly for the starter kit, practitioner handbook, and workshops and peer exchanges.

- **Led Implementing Eco-Logical Sessions at AASHTO Committee Meetings (Spring - Summer 2014)**
FHWA and AASHTO coordinated an Eco-Logical session featuring IAP recipients at the 2014 AASHTO Standing Committee on the Environment (SCOE) annual meeting and participated in the SHRP2 session at the Standing Committee on Planning (SCOP) annual meeting, both in June 2014. The SCOE and SCOP meetings are regularly attended by State DOT environmental staff. The sessions allowed FHWA and AASHTO to provide an overview of Implementing Eco-Logical and its activities and provided a forum for several IAP recipients to share updates on their Implementing Eco-Logical projects.
- **Founded the Implementing Eco-Logical On-Call Technical Assistance Team (Ongoing)**
Throughout 2013 and 2014, FHWA worked with Federal agency partners to identify preliminary members of the Implementing Eco-Logical on-call technical assistance team, which will provide customized assistance and guidance to organizations implementing the Eco-Logical approach. The team comprises representatives from various Federal agencies, including FHWA, the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), and U.S. Fish and Wildlife Service, and will leverage a wider network of resources to assist transportation agencies and their partners.
- **Established a "Champions" Team to Promote Eco-Logical (Ongoing)**
FHWA convened a group of "champions" of the Eco-Logical approach, who have a strong knowledge of Eco-Logical and its steps. These champions include representatives of Federal and State agencies, non-governmental organizations (NGOs), regional organizations, Tribal councils, and universities, including several IAP and grant recipients. Eco-Logical champions serve as advocates, helping to disseminate information, and as technical resources for agencies looking to implement Eco-Logical.
- **Convened the FHWA/AASHTO Implementing Eco-Logical Team (Ongoing)**
As one of their first steps in Implementing Eco-Logical activities, FHWA and AASHTO organized a cross-agency team, which meets biweekly to discuss progress on Implementing Eco-Logical tasks. These meetings provide a forum for team members to share updates and information on the various activities underway.

FHWA Research Program Funded Activities

Since 2007, FHWA has offered several other activities in addition to Implementing Eco-Logical that relate to the Eco-Logical approach. These include the Eco-Logical Grant Program (now complete), the Eco-Logical webinar series, and continued coordination with the Eco-Logical Signatory Agencies.

Eco-Logical Grant Program

Initiated in 2007, the goal of FHWA's [Eco-Logical Grant Program](#) was to test applications of the Eco-Logical approach and increase awareness and adoption among transportation and resource agencies. Under the program, the FHWA Office of Planning, Environment, and Realty initiated 15 cooperative agreements totaling approximately \$1.4 million. Recipients included State DOTs, Federal and State resource agencies, MPOs, local governments, NGOs, and one university. These grant projects are now complete and referenced in Appendix B.¹¹

The Eco-Logical Grant Program allowed agencies to apply Eco-Logical, exploring how it fits in the transportation development and delivery process. The Implementing Eco-Logical IAP helps advance agencies that have already begun to incorporate Eco-Logical into their activities and also support those that are interested in beginning to implement the approach.

Eco-Logical Webinar Series

FHWA currently offers bi-monthly webinars as part of its Eco-Logical Program. These webinars are recorded and available on the [FHWA Eco-Logical website](#). In selecting future webinar topics, FHWA will consider the technical assistance needs identified by IAP recipients.

Signatory Agency Coordination

FHWA supports ongoing meetings and collaboration among the Signatory Agencies to identify opportunities where the agencies can provide guidance for continued implementation of the Eco-Logical approach and support to organizations applying Eco-Logical. The Signatory Agencies participate in biannual meetings to discuss multi-agency outreach and opportunities for promoting widespread adoption of Eco-Logical.

Moving Eco-Logical Forward

FHWA and AASHTO currently lead multiple activities related to Implementing Eco-Logical. These activities provide a comprehensive deployment approach for implementing Eco-Logical. Many of the activities are anticipated for release in 2015. FHWA and AASHTO may consider incorporating the findings of this annual report into future management of these activities.

Implementing Eco-Logical IAP

FHWA continues to coordinate with the IAP recipients, several of whom have completed their Implementing Eco-Logical projects. IAP recipients share semi-annual updates of their activities with FHWA, the next iteration of which will occur in winter 2015.

¹¹ Additional information on the grant recipients is provided in the [2012 Eco-Logical Grant Program Annual Report](#).

Starter Kit

AASHTO, in partnership with FHWA, is developing a starter kit, an online resource to be available on the [FHWA Eco-Logical website](#) starting in early 2015. The starter kit will provide a variety of materials for agencies interested in using or learning more about the Eco-Logical approach.

Practitioner's Handbook

The Implementing Eco-Logical Practitioner's Handbook is being prepared by AASHTO and will follow the style of the AASHTO Center for Environmental Excellence's Practitioner's Handbook [series](#). Designed directly by AASHTO, with support from FHWA, the Implementing Eco-Logical Practitioner's Handbook will serve as a useful first reference for agencies considering implementing Eco-Logical. The Practitioner's Handbook will be available online and in hard copy starting in 2015.

Workshops and Peer Exchanges

FHWA and AASHTO will offer workshops and peer exchanges as part of the Implementing Eco-Logical activities beginning in 2015. Workshops will feature targeted training on the Eco-Logical approach customized for a State DOT or MPO. Peer exchanges will bring multiple State DOTs or MPOs together to discuss a common issue or challenge such as mitigation banking or REF development.

On-Call Technical Assistance

The on-call technical assistance team will provide as-needed, customized assistance to agencies on an ongoing basis. Agencies interested in applying for on-call technical assistance will be able to submit requests starting in 2015 via the [FHWA Eco-Logical website](#).

"Champions"

FHWA is developing channels to engage champions in Implementing Eco-Logical activities. Examples of activities to be performed by champions include serving as resources for the on-call technical assistance team, reviewing drafts of Implementing Eco-Logical products, and providing feedback on applying the Eco-Logical approach based on their agencies' experiences.

Recommendations for the Implementing Eco-Logical Program

The Implementing Eco-Logical Implementation Plan calls for developing resources that will encourage using the Eco-Logical approach across the country. These activities and products include continued support of the IAP, starter kit, Practitioner's Handbook, and peer exchanges and workshops. Each of these resources may benefit from the findings of the IAP projects, particularly with regard to common challenges and specific opportunities for additional research or resources. Based on feedback provided by the IAP recipients, FHWA and AASHTO should consider the following next steps:

- **Develop promotional materials and web resources that can help explain the Eco-Logical approach and/or REF to partners or stakeholders unfamiliar with Eco-Logical.** As stakeholders' understanding of Eco-Logical may vary, introductory materials on the Eco-Logical approach as well as ongoing updates to the [FHWA Eco-Logical website](#) can provide common starting points for discussions. The starter kit and Practitioner's Handbook, both currently in development, will also serve as resources for agencies interested in Eco-Logical.

- **Share existing materials on topics such as conservation or transportation planning processes or mitigation banking to educate Eco-Logical stakeholders.** Because the Eco-Logical approach engages partner agencies and staff with different backgrounds, materials on topics relating to Eco-Logical provide additional context to agencies not directly involved in these areas.
- **Create a list of the specific benefits Eco-Logical can bring to different stakeholder groups.** By demonstrating the specific benefits tied to a stakeholder group, agencies often achieve greater buy-in and support for Eco-Logical.
- **Offer best practice examples of Memoranda of Agreement (MOAs) and Memoranda of Understanding (MOUs) between transportation and resource agencies (e.g., data-sharing agreements, agreements related to best management practices [BMPs]).** For agencies interested in establishing formal agreements, examples and templates serve as helpful resources in getting started.

IAP and Pilot Implementation of the Eco-Logical Approach

Eco-Logical's State of the Practice

From its early roots in 2006 as a concept focused on integrating infrastructure and ecosystem considerations to its initial testing by recipients in FHWA's Eco-Logical Grant Program, Eco-Logical represents a long-standing commitment to transportation and the environment. It is dedicated to encouraging collaboration, engaging partners, and identifying opportunities to use an ecosystem-based mitigation approach to broaden infrastructure development and conservation planning processes so that they consider a variety of environmental priorities, data, plans, and designs.

The Implementing Eco-Logical IAP serves as the next step in Eco-Logical's history, as it further advances the state of the practice. Today's IAP recipients use knowledge gained by past Eco-Logical grant recipients as a starting point. They continue to test the Eco-Logical approach, its applications, and uses. The IAP projects discussed in this report demonstrate how the State DOT and MPO recipients are tackling difficult issues using innovative methods; these activities are helping recipients realize tangible improvements to transportation projects and processes and enhance the environment. The insights shared here also connect to AASHTO's business readiness evaluation, which assesses the current state of the practice of Eco-Logical across transportation agencies based on the feedback received.

IAP Lead Adopter and User Incentive Recipients

The IAP features 14 Lead Adopter and User Incentive projects led by 13 recipients, representing a range of agencies, States and regions, and projects (Table 2).¹² Project timelines range from one to approximately two years. Project funding Appendix A includes detailed summaries of each project. Figure 3 provides a map of both the IAP recipients and past Eco-Logical grant recipients.¹³

The IAP provides two types of funding assistance to help State DOTs and MPOs apply and integrate Eco-Logical principles in their activities:

- The **Lead Adopter** Incentive provides assistance to organizations to participate as lead adopters in implementing a SHRP2 product. Implementing Eco-Logical IAP Lead Adopter recipients have demonstrated initial progress in the early steps of ecosystem-based planning and in applying the Eco-Logical approach.
- The **User Incentive** offers assistance to organizations that are interested in a SHRP2 product but may not currently wish to participate at the lead adopter level. Many of the Implementing Eco-Logical IAP User Incentive recipients use the funding to help bring Eco-Logical into their organizations.

¹² One Implementing Eco-Logical IAP recipient – the Idaho Transportation Department – received both Lead Adopter and User Incentive funding.

¹³ Two Implementing Eco-Logical IAP Lead Adopter recipients – Charlottesville-Albemarle MPO and North Central Texas Council of Governments – are also past Eco-Logical grant recipients.

Table 2: IAP Lead Adopter and User Incentive Recipients

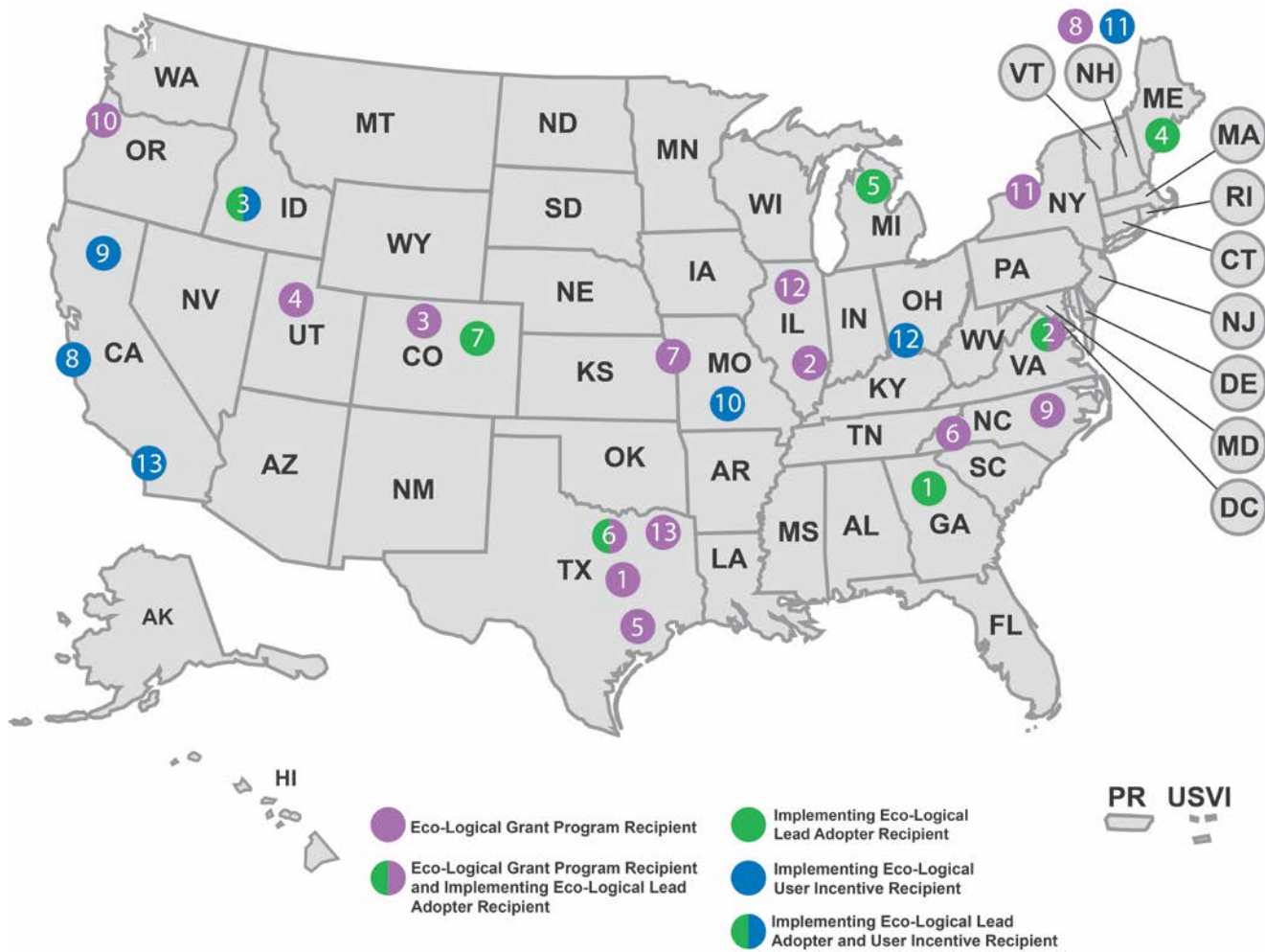
Lead Adopter Recipients	Project Description
Atlanta Regional Commission (ARC)	ARC is developing protocols and models to link economic factors with green infrastructure and transportation planning to enhance REF outcomes.
Charlottesville-Albemarle MPO (CAMPO)	CAMPO is testing the application of an existing REF in transportation projects and conservation prioritization throughout its region in Virginia.
Idaho Transportation Department (ITD)	ITD is partnering with the Idaho Department of Fish and Game (IDFG) to improve data delivery and sharing to IPLAN—a web-based, cloud portal that enables staff and customers to view ITD data sources. The project includes refinement of the Crucial Habitat Assessment Tool layers and establishment of data-sharing protocols. ¹⁴
Maine DOT (MaineDOT)	MaineDOT is applying its REF to Categorical Exclusion projects, including gap analysis, procedural changes, preferred construction practices, and programmatic agreements.
Michigan DOT (MDOT)	MDOT is implementing the IEF steps in the I-75 corridor in the southeast Michigan/Lake Erie coastal zone.
North Central Texas Council of Governments (NCTCOG)	NCTCOG is updating its REF to build a priority sub-watershed map and identify focus areas for potential mitigation and enhancement. NCTCOG then plans to apply the REF to a pilot corridor feasibility study and implement a pilot regional shared mitigation program.
Pikes Peak Area Council of Governments (PPACG)	PPACG is establishing an Integrated Regional Mitigation Plan to improve mitigation projects in the Pikes Peak area and applying it to project evaluation in its regional transportation plan.

User Incentive Recipients	Project Description
Association of Monterey Bay Area Governments (AMBAG)	AMBAG is gathering transportation and natural resource data and developing a new REF.
California Department of Transportation (Caltrans)	Caltrans is expanding its Highway 89 Stewardship Team to address animal/vehicle collisions through mentoring new groups and providing training and technical assistance.
Idaho Transportation Department (ITD)	ITD is working to update and revise a current MOU with IDFG to improve data delivery and data sharing.
Missouri DOT (MoDOT)	MoDOT is working with the Missouri Department of Conservation (MDC) to help identify and incorporate new information, technologies, and BMPs that will be used to update the Missouri Natural Heritage Review website to provide better applications for transportation planning and deliver enhanced benefits for the natural resources.
New Hampshire DOT (NHDOT)	NHDOT, in partnership with the New Hampshire Natural Heritage Bureau, is implementing a pilot project to assess wetlands impacted by roadway projects using standardized wetland assessment methodology called an Ecological Integrity Assessment (EIA) and comparing the EIA to its currently used wetland assessment method, the USACE Highway Methodology.
Ohio Kentucky Indiana Regional Council of Governments (OKI)	OKI is integrating and mapping data from three State natural heritage databases with its regionally significant environmental resource data to inform the OKI Regional long-range transportation plan (LRTP). ¹⁵
Southern California Association of Governments (SCAG)	SCAG is developing a regional open space database and an assessment methodology to identify important areas for conservation.

¹⁴ The Crucial Habitat Assessment Tool, or CHAT, is a tool sponsored by the Western Governors’ Association that aims to bring greater certainty and predictability to transportation and conservation planning through online maps of crucial wildlife habitat and corridors in States such as Idaho and others. For more information, please visit: <http://www.westgovchat.org/>.

¹⁵ The term “LRTP” is noted here, as it is referred specifically in several of the IAP recipients’ planning activities. FHWA uses the term “Metropolitan Transportation Plan,” or “MTP,” to describe LRTP activities.

Figure 3: Map of Eco-Logical Grant and IAP Recipients



Eco-Logical Grant Program Recipients

- 1 Capital Area Council of Governments
- 2 Chicago DOT
- 3 Colorado DOT
- 4 Envision Utah
- 5 Houston-Galveston Area Council of Governments
- 6 Land-of-Sky Regional Council
- 7 Mid-America Regional Council
- 8 New Hampshire Audubon
- 9 North Carolina Department of Environment and Natural Resources
- 10 Oregon State University
- 11 Tioga County Soil and Water Conservation
- 12 Tri-County Regional Planning Commission
- 13 U.S. Environmental Protection Agency, Region 6

Implementing Eco-Logical IAP Recipients

- 1 Atlanta Regional Commission
- 2 Charlottesville-Albemarle MPO
- 3 Idaho Transportation Department
- 4 Maine DOT
- 5 Michigan DOT
- 6 North Central Texas Council of Governments
- 7 Pikes Peak Area Council of Governments
- 8 Association of Monterey Bay Area Governments
- 9 California DOT
- 10 Missouri DOT
- 11 New Hampshire DOT
- 12 Ohio Kentucky Indiana Regional Council of Governments
- 13 Southern California Association of Governments

IAP Performance Measures and Focus Areas

During the summer 2013 kick-off calls, IAP Lead Adopter and User Incentive recipients identified performance measures for their projects. The measures represent targets and milestones to help FHWA and the IAP recipients gauge progress and identify issues or areas of concern in implementing the Eco-Logical approach. Recipients' feedback about the IAP projects and milestones also provides FHWA with practitioner-based input to guide the development of technical assistance resources available through the Eco-Logical Program.

IAP recipients were asked to select performance measures under three focus areas, as shown in Table 3.

Table 3: IAP Measure Descriptions

Measure Focus	Measure Description
Use of the REF and data tools in the decisionmaking process within your agency (REF in decisionmaking)	Developing and applying the REF, or other related methodologies, is an important strategy for using the Eco-Logical approach. This measure focuses on how an agency uses the REF and data tools in its decisionmaking process.
Integration of planning and decisionmaking between agencies	The Eco-Logical approach is designed to help transportation agencies integrate their infrastructure development and conservation planning decisionmaking processes with resource and regulatory agencies' processes to arrive at a common set of environmental priorities. Written materials, whether regular meeting minutes, data-sharing agreements, or formal MOUs, are one way that partner agencies can document their aligned priorities and decisions.
Incorporation of the Eco-Logical approach into the management and culture of your organization (Agency culture and management adoption)	The Eco-Logical approach encourages increased support for and understanding of Eco-Logical principles within an agency. To increase the level of familiarity with Eco-Logical, agencies often organize training opportunities, establish new policies, encourage staff "champions," and provide presentations to their leadership and external stakeholders.

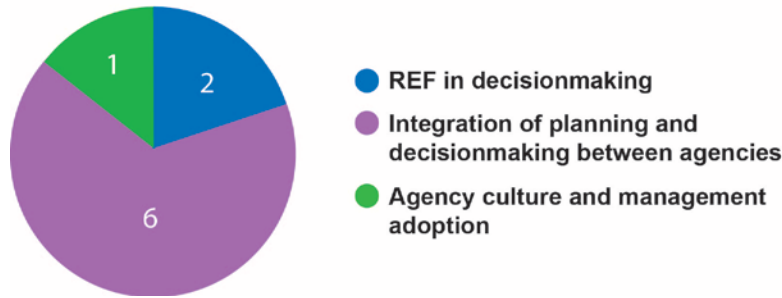
Lead Adopter IAP recipients selected three performance measures, one under each of three focus areas important in formalizing the Eco-Logical approach within their agencies.

User Incentive IAP recipients identified one measure using the same focus areas as the Lead Adopters. In some cases, User Incentive recipients indicated other possible, secondary measures that could be used.¹⁶

The majority of User Incentive recipients identified measures that fell under the *integration of planning and decisionmaking between agencies* focus area (Figure 4).

¹⁶ These measures still fell under the three focus areas of: REF in decisionmaking; integration of planning and decisionmaking between agencies; and agency culture and management adoption.

Figure 4: User Incentive Measures



User Incentive recipients selected one measure to track milestones for their projects. Six recipients identified *integration of planning and decisionmaking between agencies* as their focus area of choice. Two recipients selected *REF in decisionmaking*, and one chose *agency culture and management adoption*. Two recipients selected additional measures, which are reflected in the numbers shown.

Project Milestones

Over the past year, IAP recipients have actively engaged stakeholders, coordinated with project partners, and began outreach efforts to integrate Eco-Logical into their agencies’ practices and encourage an ecosystem-based approach. From establishing data-sharing agreements and MOUs to building partnerships and engaging stakeholders, recipients have demonstrated a variety of ways to implement Eco-Logical under the three focus areas described above. A few examples of milestones and progress towards the IAP project goals are provided in Table 4.

Table 4: IAP Measures and Recipient Examples

Measure Focus	IAP Recipient Examples	
REF in decisionmaking	AMBAG created 32 maps incorporating approximately 300 transportation projects, overlaying them with environmental data. The maps include projects that potentially involve significant construction or land redevelopment to help local agencies in the region better understand the connections between regional transportation projects and nearby ecological resources.	CAMPO used its REF as a method to help establish a weighted ranking system for evaluating the impacts of the project alternatives on ecosystem and recreation resources in the Rivanna River watershed. CAMPO also held a series of stakeholder meetings to explain its REF tool and demonstrate how it can be used in the decisionmaking process. This facilitated process allowed stakeholders to share feedback on alternatives and address concerns.
Integration of planning and decisionmaking between agencies	Caltrans helped establish two new collaborative groups to encourage strategic planning for wildlife and highway interactions along the 89ST corridor in Southern Sierra and Modoc counties. Team members participate in trainings and meetings to discuss Eco-Logical, field research, and possible mitigation concepts.	OKI prepared and executed data-sharing agreements with the three State agencies responsible for natural heritage databases in Ohio, Kentucky, and Indiana. In keeping with these agreements, OKI received natural heritage data from all three States and conducted analyses to determine the best use of the data to inform OKI’s next LRTP.
Agency culture and management adoption	NCTCOG is expanding awareness of Eco-Logical beyond the planning staff involved in its initial grant project. This process includes conducting training sessions, developing management communications, and establishing a more formal process for including the REF in agency decisionmaking.	MDOT organized internal presentations on the Eco-Logical approach aimed at raising the level of awareness of MDOT staff. Further training will depend on the results of MDOT’s REF. MDOT plans to establish Standard Operation Procedures for evaluating projects with the REF to integrate it into the agency’s processes.

Findings for the Eco-Logical Approach

The project team analyzed the information and perspectives shared by the IAP and grant recipients through the interviews, electronic questionnaire, and other project materials and data to identify key findings about the state of the practice of the Eco-Logical approach. These findings fit into four categories:

1. Establishing Diverse Partnerships, Interagency Coordination, and Stakeholder Buy-In
2. Developing Data-Sharing Strategies and Protocols
3. Communicating the Eco-Logical Approach Effectively
4. Integrating Eco-Logical into Agency Practices

Establishing Diverse Partnerships, Interagency Coordination, and Stakeholder Buy-In

Strong partnerships between transportation, resource and regulatory agencies, and other external stakeholders are crucial to the success of the IAP and grant projects. Despite the advantages of collaboration, partnerships can sometimes be difficult to establish. Engaging new stakeholders and using opportunities to bring stakeholders together can help bridge differences and build a common understanding or joint goal for a project or process.

- 1. Long-term implementation of an Eco-Logical project frequently depends upon the partnerships established under the project and the extent to which agencies can leverage these partnerships to pursue new collaborative efforts.** Interagency partnerships continue to be an important element of agencies' successful implementation of Eco-Logical. Eco-Logical grant and IAP recipients repeatedly noted that interagency partnerships were one of the most significant outcomes of their projects. Eco-Logical grant recipients have used partnerships stemming from their grant projects as starting points for new planning and project delivery efforts, including strategies for proactive conservation at the region plan, program, and project levels. Similarly, IAP recipients observed that the partnerships allow for a cross-agency dialogue around potential issues and present opportunities for continued collaboration. These partnerships play a major role in how recipients apply the results from their Eco-Logical projects to future initiatives.

Example: The [North Carolina Department of Environment and Natural Resources](#) (NCDENR) coordinated extensively with the North Carolina Department of Transportation (NCDOT), North Carolina MPOs and rural planning organizations, and other stakeholders during its Eco-Logical grant project to develop the [NC Conservation Planning Tool](#) (CPT), a strategic conservation planning tool for the State. NCDENR applied the CPT to improve the integration of conservation data into statewide and regional transportation planning activities. The data developed during the Eco-Logical grant project also became a primary feature of the North Carolina Wildlife Resources Commission's [Green Growth Toolbox](#). NCDENR is currently partnering with NCDOT to lead an Interagency Coordination Protocol initiative, which will offer best practices for using the CPT and conservation data to promote effective long-range transportation planning practices in North Carolina.

- 2. Advancing the Eco-Logical approach among partner agencies requires ongoing education and outreach efforts by grant and IAP recipients.** Ongoing outreach is necessary to ensure Eco-Logical remains a priority for partners (e.g., local agencies, State resource agencies) and to preserve the momentum of Eco-Logical

projects following completion of the initial grant or IAP projects. Many Eco-Logical grant recipients continue to share information about their projects and related current activities with partners through stakeholder and public meetings, webinars, conferences, and workshops. Project websites and online or printed materials can also provide background information and updates. As grant or IAP recipients may not be implementing agencies, having continued outreach efforts in place can help keep Eco-Logical at the forefront of implementing agencies' priorities.

Example: [Oregon State University](#) (OSU)'s Eco-Logical grant project established a REF to identify conservation priority areas in Oregon and compile this data across the State. Through presentations, meetings, and regular discussions, OSU achieved buy-in from EPA, the Oregon Department of State Lands, and the Oregon Department of Environmental Quality, as the agencies informally agreed to adopt OSU's identification methods for wetland mitigation sites. The three agencies are also supporting the development and maintenance of OSU's [Oregon Wetlands Explorer](#), which provides access to wetland mapping tools, data, images, and other wetland resources. In addition, OSU's continued promotion of the Eco-Logical approach resulted in the Oregon DOT and other State agencies' integrating Eco-Logical into how they conduct and coordinate project reviews between transportation and environmental agencies.

Developing Data-Sharing Strategies and Protocols

Several Eco-Logical grant and IAP recipients, particularly IAP User Incentive agencies, aim to establish data-sharing protocols between transportation and resource agencies to streamline planning processes and improve environmental outcomes. Data-sharing protocols and agreements help overcome concerns related to data quality and availability, particularly the use of sensitive resource data. IAP recipients have established two overarching strategies to overcome data-related challenges.

- 3. Agencies use informal collaboration and MOUs to overcome legal issues and sensitivity concerns surrounding data sharing.** Data used in Eco-Logical grant and IAP projects often relate to areas of significant environmental concern or priority. With highly sensitive data involved, Eco-Logical grant and IAP recipients sometimes find that initial requests for such data may be difficult to advance. Agencies may have different protocols for sharing this type of data, particularly given its sensitive nature. Understanding an agency's data-sharing limitations is a key preliminary step for many Eco-Logical grant and IAP recipients. With this understanding in place, the recipients can then work with partner agencies that maintain the data to determine appropriate approaches, whether informal or formal, for sharing data while respecting the sensitivity of the datasets. Informal approaches may include partnerships with resource agencies, while more formal methods often involve official data-sharing agreements. The discussions between agencies regarding the appropriate use of this data, whether or not a formal agreement is signed, help establish a strong, collaborative starting point for a continued agency partnership as well as opportunities for future integration of the Eco-Logical approach into agencies' practices.

Example: [MoDOT](#)'s close collaboration with partner MDC has allowed for improved sharing of natural resource information between the two agencies, as they collaborate to update MDC's [Missouri Natural Heritage Review](#) website as part of the User Incentive project. MoDOT and MDC meet frequently to discuss data challenges and share ideas. In-person discussions and a

recent stakeholder meeting among MoDOT, MDC, and their partners have also strengthened communications regarding data sharing. In addition, the meeting helped partners understand the types of data available that could support their own work. To formalize their partnership, MoDOT and MDC are working toward a MOU to further integrate transportation and conservation planning considerations and establish BMPs that protect threatened and endangered species from transportation project impacts.

- 4. Developing standard interagency templates can help overcome technical issues related to data quality, which often complicate the process of sharing data between agencies.** Transportation agencies often do not have consistent access to resource data for transportation planning and project development, as agencies may have different approaches for categorizing or tracking data. Data quality issues may include inconsistently formatted or incomplete datasets, or data that have not been fully digitized. The Eco-Logical approach can provide the opportunity to address these technical issues as agencies partner to build and refine transportation and conservation databases that are consistent, accurate, and comprehensive. Customized data-sharing templates allow agencies to address potential data-quality issues and integrate datasets more effectively. These templates can then help agencies save time and resources in applying Eco-Logical.

Example: [OKI](#) experienced an initial challenge related to the varying levels of detail included in the datasets it received from its resource agency partners in Ohio, Kentucky, and Indiana. To resolve this issue, OKI established data-sharing agreements with the State agencies responsible for the natural heritage databases in these three States. OKI ensured consistency across all three arrangements by developing a common template for each of the agencies to complete. OKI then worked individually with each agency to tailor the agreement to fit State-specific considerations. By collaborating with its resource agency partners, OKI was able to resolve data discrepancies and produce a unified dataset. The standardized agreements also allow OKI to perform consistent analyses across its full three-State region, helping the agency apply the Eco-Logical approach on a regional scale.

Communicating the Eco-Logical Approach Effectively

Communicating the benefits of the Eco-Logical approach is essential for building partnerships and promoting the implementation of Eco-Logical. IAP and grant funding recipients noted that targeted messages regarding the benefits of Eco-Logical encourage buy-in and raise awareness. Many recipients remarked that early and frequent communication about Eco-Logical builds and maintains strong working relationships with partner agencies. Despite these strategies, recipients still find challenges in demonstrating the quantitative benefits of the Eco-Logical approach.

- 5. Messages that target the specific benefits Eco-Logical can bring to a particular stakeholder group are more likely to encourage the group's buy-in for the approach.** Eco-Logical has many benefits for many stakeholder groups, but general messages about Eco-Logical do not always have the same impact as tailored messages. When communicating to stakeholders, Eco-Logical IAP and grant recipients have found value in developing presentations and materials that highlight benefits of the Eco-Logical approach that are

specific to the audience being addressed. For example, a presentation to transportation planners may focus on how the Eco-Logical approach can help identify priority areas for conservation and mitigation that agencies can then bring in to their transportation planning and long-range planning processes. Materials addressed to a State resource agency might demonstrate how Eco-Logical applies an ecosystem-based approach to encourage enhanced environmental outcomes. Refining these messages based on the stakeholder group will clearly show what they will receive by participating in the Eco-Logical approach, and allows agencies to achieve buy-in more effectively from their stakeholders.

Example: With a diverse set of county transportation commissions (CTCs), local governments, and other stakeholders in its 6-county, 191-city region, [SCAG](#) needed to explain Eco-Logical in a way that clearly conveyed its benefits and potential applications under many different settings. As the CTCs were the primary audience for SCAG’s IAP project, SCAG organized a workshop specifically for CTC staff to demonstrate the project’s open space database and how it could be used to identify areas for conservation and mitigation in the region. The event helped SCAG explain the tool and its uses to a target user group and ultimately led to greater buy-in for the IAP project. To date, SCAG has established joint work program MOUs with four of the six CTCs. Local transportation partners are also starting to use the database in their planning and project development activities.

- 6. Agencies continue to face challenges in quantitatively measuring the benefits of Eco-Logical and in making a “business case” based on cost, time, and other savings measures.** Agency leadership consistently requests cost-and time-savings demonstrations for infrastructure projects, but evidence of these savings from using the Eco-Logical approach remains limited. Tracking direct benefits requires establishing baseline measures at the onset of a project and continued monitoring during and after project completion. This quantitative tracking relies on existing data, and in many cases, this data may be inconsistent or incomplete. Agencies may also have limited staff time or resources to develop measures, monitor progress, or analyze results. To date, no publically available standard framework or metrics exist for quantifying benefits for Eco-Logical.¹⁷ One grant recipient suggested the implementation of project recommendations may serve as a good way to track projects’ success in the absence of formal measures. Having quantitative examples of the benefits realized by agencies applying Eco-Logical builds an even stronger message for agencies needing to make a “business case” for the approach to their stakeholders, partners, or leadership.

Integrating Eco-Logical into Agency Practices

Achieving long-term implementation of Eco-Logical often relies upon agencies integrating its principles into their business practices. Eco-Logical grant and IAP recipients commented that successful projects require a high degree of familiarity with the Eco-Logical approach among their agencies’ staff as well as “champions” within the agency to promote its use. In some cases, agencies may use an ecosystem-based approach, similar to Eco-

¹⁷ FHWA, with support from the Volpe Center, developed a preliminary Eco-Logical benefits framework to help agencies demonstrate the differences between the standard transportation delivery process and the Eco-Logical approach. The framework includes a series of process models to demonstrate examples of the economic benefits that using the Eco-Logical approach can bring. After FHWA fully finalizes this document, it can deploy the process.

Logical, but may label it differently. Regardless of the term used, incorporating Eco-Logical into agencies' formal processes fully integrates the approach as a new kind of "business as usual."

- 7. Staff "champions" at the project level are key initiators for integrating Eco-Logical into an agency's practices.** Several IAP recipients indicated a bottom-up approach to implementing Eco-Logical that starts with staff members involved in the IAP project. Staff members managing Eco-Logical projects often hold training sessions and inter-departmental meetings to help build familiarity with the Eco-Logical approach at their agencies, particularly among their environmental and transportation departments. These trainings and meetings help agency staff not involved directly in an Eco-Logical project learn how the Eco-Logical approach could benefit and connect to their work. In addition, staff "champions" may guide the coordination activities and informal interagency partnerships that regularly stem from Eco-Logical projects into more formal actions that demonstrate an agency's commitment to the Eco-Logical approach. These more formal activities may include leadership recognition, signed MOUs, or inclusion of Eco-Logical project data into regional transportation planning and long-term planning activities. The efforts of these staff "champions" lead to a stronger understanding of Eco-Logical across their agencies, allowing for intra-agency education and formalized pathways for supporting the approach.

Example: Partners [ITD](#) and IDFG are updating an existing MOU as part of ITD's joint Lead Adopter and User Incentive project. The MOU will establish new data-sharing protocols and coordination processes for transportation planning and wildlife management in Idaho. Before initiating work on the MOU, staff-level Eco-Logical practitioners at ITD and IDFG led the development of an MOA that established the framework for their agencies' partnership and collective goal for an updated MOU. ITD and IDFG are currently guiding the MOU review and approval process, which will involve both agencies' legal counsels, the ITD and IDFG directors, the Idaho Transportation Board, and the IDFG Commission.¹⁸ Once approved, the complete MOU will represent buy-in from stakeholders at all levels of the agency, from practitioners to executive leaders. In addition, the MOU will demonstrate the important role that staff "champions" play in promoting Eco-Logical and integrating it into agency practices.

- 8. Existing "Eco-Logical"-like activities within an agency may not be formally associated with FHWA's Eco-Logical Program but still promote similar activities, offering an opportunity for future research.** Agency staff are sometimes unfamiliar with the terms "Eco-Logical" or "REF," particularly if they are not directly engaged in an Eco-Logical grant or IAP project. In some cases, staff within the recipient agency may be more familiar with terms such as "landscape-scale" or "environmental consultation." As "environmental consultation" follows more closely from SAFETEA-LU, agencies may be more likely to use this term than "Eco-Logical," which is not expressly referenced in Federal legislation.¹⁹ Several IAP recipients observed

¹⁸ The seven-member Idaho Transportation Board supervises and administers ITD. Its responsibilities include establishing Idaho's transportation policy and guiding the planning, development, and management of the State's transportation network. The IDFG Commission administers the State's fish and game policies.

¹⁹ Passed in 2005, SAFETEA-LU expanded environmental considerations for metropolitan and statewide transportation planning. [Section 6001](#) of SAFETEA-LU requires that environmental considerations be included in the development of MTPs. [Section 1310](#) of MAP-21 continues this requirement.

their agencies use an ecosystem-based approach for infrastructure projects, but the term “Eco-Logical” is not specifically used in conjunction with the projects. As part of FHWA’s Eco-Logical Program, future materials could address how Eco-Logical may fit with an agency’s existing practices even though the agency uses different phrasing. These resources could then help FHWA bridge connections between Eco-Logical and agencies’ current work, providing more familiarity to agency staff about the Eco-Logical approach.

Example: While [ARC](#) has experience in developing a REF and using an ecosystem-based approach, it noted that it has not always used the “REF” term. Through its IAP project, ARC aims to leverage its existing regional-scale environmental analyses to support the development of a REF at a more local level. The development of its REF and participation in the IAP has helped ARC understand how many of its existing comprehensive planning activities fit into the Eco-Logical approach, even if they are not always termed as such. In particular, ARC noted that the term “environmental consultation” may be more familiar to stakeholders. With this understanding in mind, ARC has been actively promoting the IAP project among its staff through informal discussions and meetings to build the level of awareness of the term “Eco-Logical.”

- 9. Eco-Logical’s connections to non-transportation-related infrastructure present opportunities to integrate it into other areas of practice and to engage new partners.** While the majority of IAP and grant recipient projects focus primarily on applying Eco-Logical to transportation or transportation-related projects, Eco-Logical offers an ecosystem-based approach for all infrastructure projects. IAP and grant recipients noted opportunities to use the Eco-Logical approach to apply a comprehensive outlook for improving infrastructure that includes sectors outside of transportation (e.g., water infrastructure, land use planning). The improved data sources, maps, and other resources resulting from the Eco-Logical grant and IAP projects can often extend to other uses in the project regions and States. In addition, Eco-Logical’s flexibility and focus on partnerships and collaboration helps make it relevant to all stakeholders. These connections to other types of infrastructure provide a possible avenue for additional research or best practice examples to creatively apply the Eco-Logical approach to a range of infrastructure projects.

Example: [NCTCOG](#)’s IAP project involves updating its REF, which was originally developed under its Eco-Logical grant project. One of the REF’s functions is to help agencies assess environmental impacts of proposed infrastructure projects. In its current project activities, NCTCOG recognizes the potential impact its REF and the corresponding maps and datasets could have on other sectors such as water infrastructure and bicycle and pedestrian facilities. While NCTCOG anticipate the final REF will serve as a tool for the Dallas-Fort Worth region to address conservation needs and potential mitigation strategies for transportation projects, the agency is also thinking beyond transportation and considering how the products resulting from the Eco-Logical grant and IAP projects may be useful for other types of infrastructure.

Recommendations for Agencies New to Eco-Logical and for Future FHWA Eco-Logical Activities

Based on the feedback provided by the Eco-Logical grant and IAP recipients, the following section offers recommendations for agencies interested in applying the Eco-Logical approach. It also provides considerations for FHWA as it thinks about future technical assistance opportunities for the Eco-Logical Program.

Recommendations for Agencies Interested in Applying Eco-Logical

As discussed in the previous section, the experiences of Eco-Logical funding recipients offer findings about the state of the practice of the Eco-Logical approach, within four key categories. The perspectives shared by the IAP and grant recipients present recommendations under these categories for other organizations seeking to apply the Eco-Logical approach or advance the practice of Eco-Logical. These recommendations are summarized below.

Establishing Diverse Partnerships, Interagency Coordination, and Stakeholder Buy-In

Strong partnerships between agencies support successful Eco-Logical projects. However, partnerships can sometimes be difficult to establish. Recommendations for achieving continued collaboration include the following:

1. **Leverage existing relationships with partner agencies.** Existing relationships supported by regular and consistent communications can help bolster an agency's implementation of the Eco-Logical approach and offer a starting point when beginning new initiatives.
2. **Support ongoing promotion, outreach, and education related to the Eco-Logical project and approach.** Continued outreach and education programs about the results of an Eco-Logical project maintain awareness after the project's conclusion and provide an outlet to identify new opportunities for collaboration. Regular reviews or scans of an agency's existing outreach practices can also help ensure that all stakeholders, including new stakeholders or stakeholders not previously involved in the activity are included.

Developing Data-Sharing Strategies and Protocols

Establishing data-sharing protocols between transportation and resource agencies can help streamline planning processes and improve environmental outcomes. Recommendations related to data-sharing coordination include the following:

1. **Work closely with partners to troubleshoot technical and data sensitivity issues and identify agreed-upon strategies.** Coordination may occur through informal discussions or through formal measures such as MOAs or MOUs that include methods to protect such data.
2. **Establish a data-sharing template when working across multiple agencies.** For agencies using datasets from more than one agency, designing and adapting a standard template can allow for more consistency; as part of this activity, agencies should coordinate early on to discuss who will own the data and how it will be maintained.

Communicating the Eco-Logical Approach Effectively

Communicating information about the Eco-Logical approach is necessary for building partnerships, promoting the implementation of Eco-Logical, encouraging buy-in from partners, and raising awareness of Eco-Logical principles. Recommendations for effective communication include the following:

1. **Develop tailored messages to explain how Eco-Logical relates to a particular stakeholder group and demonstrate the specific benefits it brings to the group.** Targeted messages highlight the direct benefits of Eco-Logical to a given stakeholder group (e.g., transportation or environmental professionals, agency leadership), which can help encourage buy-in more efficiently.
2. **When possible, use in-person stakeholder meetings and external facilitators to engage stakeholders and encourage information-sharing.** Eco-Logical grant and IAP recipients often made significant progress in advancing their projects when they had opportunities to connect with stakeholders in person and use facilitated forums to share ideas and feedback.

Integrating Eco-Logical into Agency Practices

Full implementation of Eco-Logical often requires agencies to integrate Eco-Logical principles into their business practices. Integrating Eco-Logical will result in more communication among staff to promote the Eco-Logical approach, and frequently greater, agency-wide recognition of Eco-Logical. Recommendations include the following:

1. **Consider a “bottom-up” approach to engage staff “champions” and encourage leadership support.** As staff “champions” frequently play an important role in promoting Eco-Logical, encourage these staff and provide opportunities for them to share information in informal or formal group settings.
2. **Identify existing agency programs that may have connections to FHWA’s Eco-Logical Program and incorporate them into future Eco-Logical activities.** As agencies may already be using the Eco-Logical approach but under a different term, articulating this message can help stakeholders better understand Eco-Logical and the role it plays in supporting an ecosystem-based approach.
3. **Look for opportunities to advance the Eco-Logical approach beyond the transportation sector.** The Eco-Logical approach applies to many types of infrastructure projects, which agencies can leverage to make connections across sectors and engage a diverse range of stakeholders.

Recommendations for Future Eco-Logical Technical Assistance Opportunities

The perspectives offered by the IAP and grant recipients provide ideas for additional research or new resources about Eco-Logical. In addition to the resources outlined in the Implementing Eco-Logical Implementation Plan, FHWA should undertake additional efforts to bolster the technical assistance resources available through the Eco-Logical Program, providing increased service to its stakeholders. Some of those efforts should include the following:

- **Design a process framework for engaging resource agencies, interdisciplinary stakeholders, and other partners throughout the Eco-Logical approach.** This framework should be based on an initial analysis of the organization and culture of stakeholder agencies that are often essential

participants in Eco-Logical activities. In addition, the framework can lead to the creation of additional materials geared toward helping agencies find effective ways to continue implementing the Eco-Logical approach and engaging partners after the formal end of an Eco-Logical project or pilot.

- **Prepare an online tutorial or other introductory tool for Eco-Logical, outside of the starter kit.** AASHTO's starter kit, currently underway, will help provide resources for agencies looking to apply Eco-Logical. FHWA should also consider other introductory online tools that agencies can use to better understand Eco-Logical and related themes, such as the connections between transportation and conservation planning.
- **Encourage access to existing materials on legal and financing practices for mitigation banking.** FHWA should compile existing resources on establishing mitigation banking programs to share with agencies that are considering these programs.
- **Offer best practice case studies focused on integrating Eco-Logical into formal projects or processes, such as mitigation plans.** The Eco-Logical grant and IAP projects serve as strong case study examples of applying the Eco-Logical approach; future case studies should also focus on how agencies are engaging with the approach according to different themes (e.g., data-sharing, partnerships, etc.). FHWA is currently developing its approach for case studies, based in part, from the findings of this annual report.
- **Demonstrate strategies for building accountability into the Eco-Logical approach and tracking the success of a REF or other Eco-Logical products.** Deploying FHWA's Eco-Logical benefits framework will provide agencies with examples of the economic benefits that Eco-Logical can bring.
- **Create materials that help agencies identify "Eco-Logical"-like activities in their existing practices and leverage these to reflect FHWA's Eco-Logical Program.** FHWA should consider developing research products that link common terms outside of "Eco-Logical" that reflect Eco-Logical principles to help agencies make connections between these terms and the Eco-Logical approach.

Guiding the Future of the Eco-Logical Program

The 2013/2014 Eco-Logical Program Annual Report summarizes accomplishments of the Implementing Eco-Logical Program and project updates from the IAP and grant recipients. By integrating this information, the report provides a basis for the current state of the practice of Eco-Logical and identifies elements for FHWA and AASHTO to consider as they continue to implement the strategies and products identified in the Implementing Eco-Logical Implementation Plan.

Implementing Eco-Logical continues the focus on advancing the Eco-Logical approach using examples from the field to identify best practices and areas where challenges remain. The accomplishments of Implementing Eco-Logical to date and its anticipated upcoming activities aim to operationalize how State DOTs and MPOs use Eco-Logical to support transportation projects. The insights shared by the IAP and grant recipients in this report help capture applications of Eco-Logical “on the ground” and identify opportunities for future technical assistance activities. These recipient perspectives further provide case study examples that highlight effective practices and continued issues.

Through these field experiences, transportation agencies not yet engaged in the Eco-Logical approach but considering its use can better understand the early steps often applied that can lead to successful outcomes. These steps may focus on building partnerships, developing resources such as data-sharing templates or targeted presentations, encouraging staff to become “champions,” and finding ways to connect agencies’ existing activities and practices to the Eco-Logical approach.

The IAP and grant recipient perspectives also provide FHWA and AASHTO with practitioner feedback for developing future Implementing Eco-Logical resources. Materials such as the starter kit and Practitioner’s Handbook will benefit from the information shared by the recipients to provide robust examples for transportation agencies striving to implement the Eco-Logical approach.

In addition, the recommendations presented in this report serve as a strong starting point for future technical assistance activities for FHWA’s Eco-Logical Program. Many of these recommendations stem from existing challenges identified by IAP and grant recipients and offer an opportunity to address these issues. Future technical assistance activities should include ways to demonstrate accountability for the Eco-Logical approach or how Eco-Logical principles may already be present in an agency’s activities.

Ultimately, this report and subsequent resources provided through Implementing Eco-Logical and the FHWA Eco-Logical Program will allow FHWA and its partners to achieve their goals of increasing awareness of Eco-Logical; integrating Eco-Logical principles into transportation, resource, and regulatory agency business practices; and producing time- and cost-savings and improved environmental outcomes through implementation of the Eco-Logical approach.

Appendices

Appendix A. Implementing Eco-Logical Implementation Assistance Program (IAP) Project Summaries

Lead Adopter Incentives

1. [Atlanta Regional Commission \(ARC\)](#): Developing a Regional Ecosystem Framework (REF) for the Proctor Creek Environmental District
2. [Charlottesville-Albemarle Metropolitan Planning Organization \(CAMPO\)](#): Testing Application of an Existing REF in Transportation Projects and Conservation Prioritization
3. [Idaho Transportation Department \(ITD\)](#)²⁰: Coordinating Transportation Planning and Wildlife Management
4. [Maine Department of Transportation \(MaineDOT\)](#): Streamlining Endangered Species Act Consultations
5. [Michigan Department of Transportation \(MDOT\)](#): Implementing an Eco-Logical Approach in the I-75 Corridor in Southeast Michigan
6. [North Central Texas Council of Governments \(NCTCOG\)](#): Applying a REF and Implementing Mitigation as Part of a Regional Shared Mitigation Program
7. [Pikes Peak Area Council of Governments \(PPACG\)](#): Establishing an Integrated Regional Mitigation Plan

User Incentives

1. [Association of Monterey Bay Area Governments \(AMBAG\)](#): Developing a REF for the Monterey Bay Area Regional Mitigation Plan
2. [California Department of Transportation \(Caltrans\)](#): Applying Lessons Learned from the Highway 89 Stewardship Team
3. [Missouri Department of Transportation \(MoDOT\)](#): Scoping Natural Heritage Review Website Updates
4. [New Hampshire Department of Transportation \(NH DOT\)](#): Implementing a Pilot Project with the New Hampshire Natural Heritage Bureau to Assess Impacts on Wetlands by Roadway Projects
5. [Ohio Kentucky Indiana Regional Council of Governments \(OKI\)](#): Coordinating State Natural Heritage Database Data
6. [Southern California Association of Governments \(SCAG\)](#): Creating a Regional Open Space Database

²⁰ ITD is also a User Incentive recipient.

Developing a REF for the Proctor Creek Environmental District

Atlanta Regional Commission. *Total cost:* \$250,000. *Schedule:* June 2013 – December 2015. *AOTR:* David Williams.

Project Goals: ARC is developing and implementing a REF for the Proctor Creek Environmental District (PCED), a key watershed in the Atlanta metropolitan area. The REF will link economic factors in this district with green infrastructure to enhance environmental and urban development outcomes. ARC aims to leverage its existing regional-scale environmental analyses to support this more local framework, which could in turn be adapted as a repeatable framework for other environmentally-sensitive local areas. In addition, ARC is using this project to begin more formally working Eco-Logical principles into its upcoming update of [The Regional Plan](#).

Project Activities and Accomplishments: In late fall 2013, ARC conducted a site visit to Proctor Creek with key stakeholders, including staff from the city of Atlanta. This site visit and other early meetings with partners helped ARC establish relationships with local stakeholders that may benefit from implementing the REF. Some of these partners are currently considering a strategic implementation framework for the district, which ARC's REF analysis would help support.

ARC's existing processes for considering the environmental effects of transportation projects in regional planning will play an important role in developing the PCED REF. Prior to beginning its Lead Adopter project, ARC was already practicing some of the core elements of the Eco-Logical approach. For example, the agency currently uses geographic information systems (GIS) spatial analysis to anticipate potential transportation impacts to environmental assets on the regional scale. ARC is now using these regional analyses as the basis for the PCED REF, and potentially, other locally specific plans.

Future Steps: ARC is now considering how it can adapt its long-range transportation plan (LRTP) analyses to the scale of PCED and other targeted areas. In 2014 and 2015, ARC will begin analyzing environmental and transportation data that will become a part of the PCED's REF. ARC also plans to use this opportunity to refine how environmental data are considered regionally as it updates The Regional Plan in 2015 and 2016.

“Understanding how our agency was already applying the Eco-Logical approach has helped us develop ideas for refining existing practices and applying the approach to a more local scale.”

- ARC staff

Insights on Eco-Logical: Beginning to develop a REF for the PCED helped ARC understand how many of its existing activities fit into the Eco-Logical approach. In particular, staff identified the regional environmental consultations introduced under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users as an important foundation for moving toward an Eco-Logical approach. Using the Eco-Logical framework allows environmental staff at the agency to communicate more effectively with internal colleagues about their role in ARC's planning and project development. ARC staff noted that informal conversations with colleagues have been particularly effective in communicating about the Eco-Logical approach.

Coordinating Transportation Planning and Wildlife Management

Idaho Transportation Department. *Total cost:* \$250,000 (Lead Adopter project), \$25,000 (User Incentive project). *Schedule:* June 2013 – December 2015. *AOTR:* David Williams/Mike Ruth.

Project Goals: The goal of the ITD joint Lead Adopter and User Incentive project is to work with the Idaho Department of Fish and Game (IDFG) to improve data delivery and data-sharing via [IPLAN](#),²¹ refine, develop, and update the [DSS/Crucial Habitat Assessment Tool](#) (CHAT)²² and other Idaho fish and wildlife-related data layers; and establish interagency data-sharing protocols and applications. ITD’s User Incentive project will update the existing Memorandum of Understanding (MOU) between ITD and IDFG, including new data-sharing protocols and improved coordination between transportation planning and wildlife management in Idaho. The MOU will support ITD and IDFG’s partnership, with a focus on improvements to data delivery and data layers.

Project Activities and Accomplishments: ITD and IDFG focused on steps to update their MOU, as it is vital to successful implementation and completion of the Lead Adopter project. ITD and IDFG held facilitated discussions between staff and identified seven key topic areas.²³ Three regional stakeholder workshops addressed these topic areas in summer 2014. Approximately 125 staff from ITD, IDFG, and Federal partner agencies attended these workshops.



Figure 6: ITD’s IPLAN portal spatially displays data through maps to help users coordinate planning and departmental activities.

To prepare for the Lead Adopter activity, ITD started coordinating with GIS practitioners within the agency to determine the feasibility of the proposed IPLAN improvements. IDFG is updating its fish and wildlife data, including its State wildlife action plan and other relevant geospatial layers, and developing data delivery applications.

Future Steps (User Incentive Project): In fall 2014, ITD will present the proposed MOU to executive staff at both agencies, and then to the Idaho Transportation Board and the IDFG Commission in January 2015.

Future Steps (Lead Adopter Project): As the MOU/User Incentive project moves ahead, ITD and IDFG will work on the Lead Adopter portion of their project in parallel. This will include establishing the mechanisms through which IDFG data layers will be accessed, used, and displayed. The work will also involve defining and building Species of Greatest Conservation Need and other useful data layers to scales and formats suitable for project-level planning and implementation through a State-based CHAT.

Insights on Eco-Logical: One key success during the project’s first year has been scheduling and preparing for the stakeholder meetings and securing a high level of participation from IDFG. ITD observed that its relationship with IDFG has improved greatly since the beginning of the project, particularly through the execution of a Memorandum of Agreement (MOA) that established the framework for working jointly on the MOU.

²¹ IPLAN is a web-based, cloud portal that enables staff and customers to view ITD’s data sources in order to integrate data across agency boundaries, in part to help integrate transportation and conservation planning.

²² CHAT is a tool sponsored by the Western Governors’ Association that aims to bring greater certainty and predictability to transportation and conservation planning through online maps of crucial wildlife habitat and corridors in States such as Idaho.

²³ The seven topic areas are: department missions, interagency communication and coordination, staff resources, data-sharing, wildlife crossings, road kill, and planning and project coordination.

Streamlining Endangered Species Act Consultations

Maine Department of Transportation. *Total cost: \$256,039 (FHWA Share: \$250,000). Schedule: June 2013 – December 2014. AOTR: David Williams.*

Project Goals: The goal of the MaineDOT Lead Adopter project is to apply its existing REF to categorical exclusion (CE) projects through creating preferred construction practices, procedural changes, programmatic agreements, and mechanisms for mitigation. The intended outcome is a streamlined Endangered Species Act (ESA) Section 7 review process in the State of Maine.

Project Activities and Accomplishments: During the first year of the project, MaineDOT completed a gap analysis comparing the Integrated Ecological Framework with MaineDOT’s existing environmental screening process. MaineDOT also analyzed its internal ESA Section 7 processes, tracked its ongoing ESA Section 7 consultations, and adjusted its consultation processes to eliminate duplicative steps. MaineDOT is working with partner agencies such as the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) to identify actions that could reduce review timeframes and complete consultations within project schedules.

“Early coordination among our staff and with partners, along with in-house expertise and agency champions, is allowing us to advance multiple activities tied to our Lead Adopter project at the same time.”

- MaineDOT staff

As part of the project, MaineDOT is also drafting a programmatic biological assessment (BA) for the endangered Atlantic salmon based upon similar programmatic agreements in other States. MaineDOT estimates that 60 percent of its projects will fall within the programmatic BA. MaineDOT also developed a draft mitigation instrument modeled after Maine’s successful in-lieu fee program. This separate mitigation instrument will apply to projects that do not fit into the BA. The instrument will facilitate mitigation for biological impacts from non-CE projects through an ecosystem crediting strategy. MaineDOT piloted this approach on a recent stream crossing replacement project. Both the mitigation and instrument and programmatic BA support use of the Eco-Logical approach by integrating conservation and transportation planning in the State of Maine.

Future Steps: MaineDOT is concluding preparation of the draft programmatic BA and mitigation instrument, which will then be shared with FHWA, FWS, and NMFS for review in summer 2014. MaineDOT plans to complete the BA and mitigation instrument before its next Work Plan is finalized in December 2014. Concurrent to these products, MaineDOT will also assess the project schedules and budgets of the 2014 construction season in order to modify its use of the REF for CE-level projects. MaineDOT will also finish developing preferred construction practices and best management practices that will improve its ability to coordinate planning activities with FWS and other resource agencies.

Insights on Eco-Logical: Like many other Lead Adopter funding recipients, MaineDOT anticipates a need for internal support for the Eco-Logical approach within its various departments, especially for the new minimization measures and mitigation practices included in the programmatic BA. MaineDOT sees a need for a high degree of coordination with partner agencies. MaineDOT recognizes that cooperation from certain partner agencies is necessary to accomplish project goals, and they are seeking ways to improve support from agency partners as they work together to define minimization measures and identify opportunities for streamlining ESA Section 7 review processes.

Implementing an Eco-Logical Approach in the I-75 Corridor in Southeast Michigan
Michigan Department of Transportation. Total cost: \$250,000. AOTR: David Williams.

Project Goals: The goal of MDOT’s Lead Adopter project is to implement a REF and Conservation Action Plan (CAP) along the I-75 corridor in the Southeast Michigan/Lake Erie coastal region. As part of this effort, MDOT created a Technical Advisory Committee (TAC) of State and Federal resource, regulatory, and planning agencies to help build the REF and CAP. These agencies will help identify mitigation opportunities for MDOT’s upcoming reconstruction and renovation work in the I-75 corridor over the next two decades.

Project Activities and Accomplishments: In the project's first year, MDOT organized the TAC and convened the group seven times. MDOT experienced a high degree of engagement from its partner agencies in the TAC, particularly in deciding on geographic study areas in the I-75 corridor, and in selecting nine conservation targets (e.g., water quality, fisheries, and coastal wetlands). To reach these decisions collectively, the TAC considered jurisdictional boundaries, watershed characteristics, coastal resources, existing conservation activities, barriers to wildlife connectivity, and water quality concerns in Lake Erie.

Representatives of the Michigan Natural Features Inventory (MNFI) and the Southeast Michigan Council of Governments (SEMCOG) helped MDOT staff prepare for the TAC meetings and plan outreach activities. MDOT’s relationship with MNFI and SEMCOG has been crucial to the success of this project, particularly in the project’s early stages, when these three agencies established joint work plans to lay out their plan for collaboration.

“One key advantage of the Eco-Logical approach is the ability to leverage relationships with resource and regulatory agencies to get involved in conservation activities outside of roadway corridors and consider the human element of existing conservation efforts.”

- MDOT staff

Future Steps: MDOT and the TAC plan to assess the conservation targets’ viability and use the REF to measure environmental outcomes associated with transportation activities in the I-75 corridor. After the viability assessment is complete, MDOT and the TAC will rank threats to the targets and identify measures that can be incorporated into project development and mitigation to address them. MDOT environmental staff also plan to conduct continuous and frequent outreach to other MDOT business units and partner agencies throughout the project, including tours of the I-75 corridor and ongoing training sessions on the Eco-Logical approach. MDOT predicts that the project’s initial success will generate work on related projects with MNFI, the Michigan Department of Natural Resources, and other TAC member agencies.

Insights on Eco-Logical: MDOT staff found the Eco-Logical approach allowed them to leverage relationships with resource and regulatory agencies and become more involved in conservation activities outside of highway corridors. MDOT observed the upfront costs of building relationships and establishing agreements, which can pay dividends over time as these partnerships often result in streamlined decisionmaking and improved environmental outcomes. MDOT believes expanding partnerships from the staff level to the organizational level through MOUs and Standard Operating Procedures for evaluating projects with the REF are useful strategies for continuing the valuable relationships built through this Lead Adopter project.

Applying a REF and Implementing Mitigation as Part of a Regional Shared Mitigation Program North Central Texas Council of Governments. Total cost: \$224,000. Schedule: June 2013 – Fall 2015. AOTR: David Williams.

Project Goals: The primary goal of NCTCOG’s IAP project is to update the REF the agency developed during a prior Eco-Logical grant project. As part of the update, NCTCOG is incorporating additional environmental data from stakeholders to build a priority sub-watershed map and identify focus areas for potential mitigation and enhancement. NCTCOG also plans to apply the REF to a pilot corridor feasibility study, which will assess the use of the REF as a tool for addressing conservation needs and potential mitigation strategies related to transportation projects throughout the region. Finally, NCTCOG aims to implement a pilot regional shared value mitigation program focused on coordinating with resource agencies to identify mitigation needs.

Project Activities and Accomplishments: In June 2014, NCTCOG held a stakeholder meeting with representatives of resource agencies, local governments, non-governmental organizations, water districts, transportation agencies, and other partners. The purpose of the meeting was to reengage NCTCOG’s partners in the Eco-Logical effort, solicit their feedback on priority resource areas to enhance potential sites for mitigation, discuss partnership opportunities, and request access to additional datasets to refine the REF. NCTCOG also completed refinements to the REF by updating supporting GIS datasets.

Future Steps: NCTCOG will next focus on applying the REF to a corridor pilot study and developing the pilot regional shared value mitigation program. NCTCOG will identify potential areas for mitigation enhancement and continue to request feedback from partners. Using this input, NCTCOG will incorporate environmental resource data from its partners into the REF. NCTCOG will then use the REF to identify possible mitigation banking sites and consider the efficacy of establishing a formal mitigation banking program for the region.

One intended outcome of the Lead Adopter project is a formalized approach for using the REF and encouraging resource agency participation in developing NCTCOG’s Metropolitan Transportation Plan (MTP). NCTCOG staff also plan to further engage departmental leaders to gain management support for the newly formalized processes.

Insights on Eco-Logical: During the execution of its Eco-Logical grant, NCTCOG discovered the value of demonstrating the benefits of Eco-Logical that are specific to the stakeholder audience it is addressing. NCTCOG also remarked on the value of tailoring messages to particular stakeholders’ understanding of the complex transportation planning process.

NCTCOG is building region-wide awareness and use of the Eco-Logical approach through outreach to additional partner agencies. In particular, NCTCOG sees opportunities for advancing the Eco-Logical approach in the Dallas-Fort Worth area by generating interest from partner agencies outside of the transportation field. Applications of Eco-Logical potentially exist outside of traditional transportation projects, such as with water infrastructure and bicycle and pedestrian facilities.

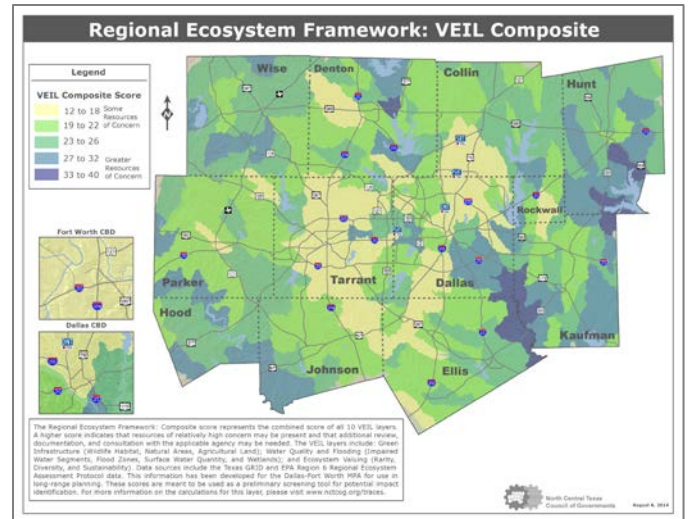


Figure 7: NCTCOG’s REF incorporates data layers relating to green infrastructure, water quality and flooding, and ecosystem valuing (e.g., diversity, sustainability).

Establishing an Integrated Regional Mitigation Plan

Pikes Peak Area Council of Governments. *Total cost: \$218,000. Schedule: June 2013 – March 2015. AOTR: David Williams.*

Project Goals: PPACG is establishing an Integrated Regional Mitigation Plan to improve mitigation projects in the Pikes Peak area in Colorado and to enhance project evaluation in its Regional Transportation Plan (RTP). PPACG will update its existing REF to reflect new data developed since its SHRP2 C18 project ended and prepare data layers that allow users to view information and assess impacts using a Google Earth [platform](#).²⁴ Using the updated REF, PPACG will also conduct a GIS analysis to evaluate the current mitigation plan in its [2035 Moving Forward](#) RTP and identify new mitigation needs and opportunities to be included in the 2040 RTP.

Project Activities and Accomplishments: PPACG held a kick-off stakeholder meeting in May 2014. PPACG will now conduct monthly meetings of a “SHRP2 Advisory Committee” that includes the Fountain Creek Watershed District, the Colorado Department of Transportation, the Colorado Department of Natural Resources, the Sierra Club, the U.S. Army Corps of Engineers (USACE), and other local, State, and Federal stakeholders.

PPACG is beginning to update its 2040 RTP and the environmental data in its REF. In June 2014, the agency determined its list of proposed projects, and staff are now overlaying these projects with existing REF data to highlight and document potential mitigation opportunities. Through this analysis, PPACG aims to identify opportunities and potential locations for advance mitigation.

Future Steps: PPACG is exploring how it could potentially coordinate its efforts for mitigation associated with non-transportation projects such as stormwater or fire. For example, Colorado’s major Southern Delivery System water infrastructure project includes mitigation activities; this may be an opportunity to maximize the effect of transportation mitigation by leveraging with these efforts. There are also several potential project mitigation opportunities that are being evaluated by the Fountain Creek Watershed Flood Control and Greenway District.

As part of its REF Google Earth update, PPACG will ensure compliance with data licensing agreements and accessibility of the tool’s interface so that users can effectively process and understand the information presented.

Insights on Eco-Logical: The estimated project costs that agencies use to plan for and program transportation investments often do not include the cost of mitigation. By examining environmental effects as part of an integrated planning approach, PPACG hopes to use the Eco-Logical approach as a way to better understand the full costs of a project, including associated mitigation. Through early coordination, costs incurred later in project development can potentially be reduced. The relationships PPACG established in its earlier SHRP2 project were also crucial in obtaining the data and buy-in necessary for updating its REF. In addition, stakeholder agencies may not be familiar with MPOs’ roles in regional mitigation. The DOT may be a more familiar partner for these statewide agencies, and can help MPOs with outreach.

“The costs of mitigating impacts, although substantial, are typically not included in project cost estimates. One advantage of the Integrated Regional Mitigation Plan is that it will allow us to identify these costs before the NEPA process begins, which may result in reduced mitigation costs and the opportunity to collaborate on mitigation projects.”

- PPACG staff

²⁴ Through its SHRP2 C18 project, PPACG used a collaborative, data-driven planning framework in developing its 2035 Moving Forward RTP. While focused on RTP development in particular, the project allowed PPACG to collect ecological data as part of an REF and reach out to new partners. More information is available at: <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3067>.

Developing a REF for the Monterey Bay Area Regional Mitigation Plan

Association of Monterey Bay Area Governments. *Total cost: \$25,000. Schedule: June 2013 – February 2014.*
AOTR: Mike Ruth.

Project Goals: AMBAG is using User Incentive funding to gather transportation and natural resource data and to develop a REF, which will include information on species, protected land, and other natural heritage information. The new REF is a series of maps showing environmental resources in areas where the agency expects transportation projects to be constructed in the next 30 years. The maps will help AMBAG and its partners highlight advanced mitigation opportunities and proactively communicate with resource agencies to determine potential mitigation strategies.

Project Activities and Accomplishments

In February 2014, AMBAG finalized the maps of its new REF, displaying anticipated transportation projects along with data collected over the course of the Implementing Eco-Logical effort. These 32 maps cover the entire 3-county region and roughly 300 potential transportation projects, focusing on the most likely locations for large-scale transportation projects. The agency established new contacts and identified and incorporated additional useful data sources by contacting existing environmental partners about data.

Future Steps

AMBAG is working on uploading its REF and other metropolitan planning organization (MPO) data to a public GIS server. Though not part of the User Incentive project, this effort will maximize the impact of Implementing Eco-Logical by enabling project proponents to easily load resource and other relevant information into project-specific maps and analyses. AMBAG anticipates that it will be able to make this resource publically available by the end of the year.

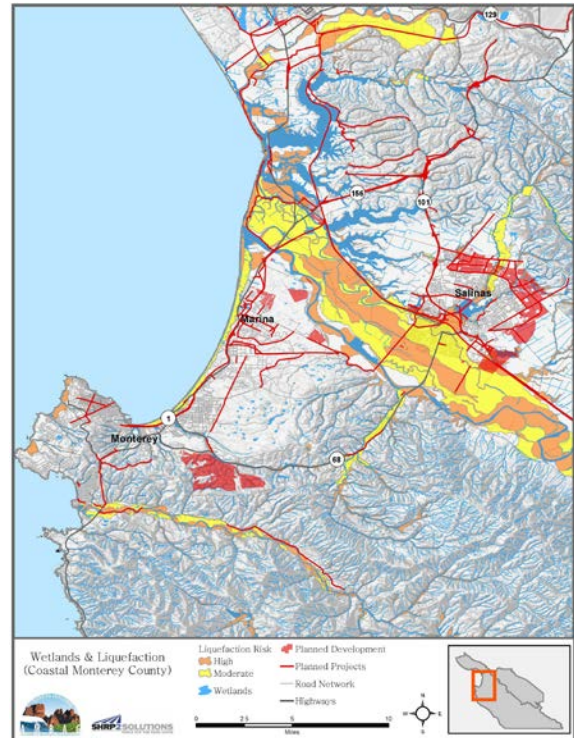


Figure 8: AMBAG created 32 maps as part of its User Incentive project. The map above shows wetlands and liquefaction risk in Coastal Monterey County.

AMBAG is exploring funding sources for the next phase of its Eco-Logical effort, which includes ongoing coordination for regional transportation mitigation. The effort would advance implementation of the IEF by identifying opportunities for advance mitigation or avoidance of environmental impacts. It would also allow AMBAG to build on relationships established through its Implementing Eco-Logical project.

Insights on Eco-Logical

AMBAG noted it was not able to include all desired datasets due to sensitivities (e.g., around archaeological sites, endangered species information) or data quality (e.g., data not digitized). Overall, AMBAG found that coordination and discussions with agencies about data sparked a useful dialogue about how that data could be more effectively and efficiently used in transportation project development. In addition, AMBAG's local transportation partners will be key users of the REF, and some have already noted that the AMBAG maps help highlight sensitive areas not previously known. The information gathered through AMBAG's project proves a starting point for other data collection efforts in the region to continue to build and refine the regional database as more projects are implemented in an area.

Applying Lessons Learned from the Highway 89 Stewardship Team

California Department of Transportation. *Total cost: \$25,000. Schedule: July 2013 – December 2014. AOTR: Mike Ruth.*

Project Goals: The Highway 89 Stewardship Team ([89ST](#)) is a multi-agency team dedicated to reducing animal-vehicle collisions and providing wildlife access through public lands along Highway 89, a two-lane highway in Sierra County, in northeast California. Caltrans is expanding lessons from the 89ST to two newly created teams in Southern Sierra (Southern Team) and Modoc County (Northern Team). The User Incentive funding provides opportunities for Caltrans to establish the new Northern and Southern teams based on the experiences of the 89ST, provides team member training at a wildlife and highway interactions course, and develops a potential long-term mitigation strategy for the teams.

Project Activities and Accomplishments: In August 2013, six members from the Northern and Southern teams attended a training course on “Innovative Approaches to Wildlife and Highway Interactions,” designed to educate environmental and transportation professionals on wildlife and highway issues, mitigation approaches, and current research. The Northern Team is focusing primarily on large mammals such as migratory deer, while the Southern Team is addressing small mammals, including the pine marten and Pacific fisher. The training brought together a multi-agency group to discuss opportunities for protecting these species while supporting transportation projects.

“Our User Incentive project demonstrates the value in coordinating and involving external partners early on. This early coordination is helping to affect positive change and results within Caltrans and with our partners.”

- Caltrans staff

Along with this capacity-building, the 89ST also provided in-person support for growing the expertise of the Northern and Southern Teams. In February 2014, 89ST team members held a strategic planning meeting with the Northern Team to set learning objectives, identify steps for field research, and explore areas of concern and possible mitigation concepts. The Northern Team includes approximately 8-10 entities, with staff from Caltrans and the California Department of Fish and Wildlife. In April 2014, the 89ST met with the Southern Team, a slightly larger team of about 12-14 entities, to review existing locations of State highway structures where the U.S. Forest Service has monitored small mammal activity and potential mitigation locations.

Next Steps: At an August 2014 iteration of the “Innovative Approaches” workshop, Caltrans sponsored staff attendance for Northern and Southern Team members who did not participate previously in the training. Caltrans plans to continue documenting and sharing past activities and successes of the 89ST to encourage and grow the Northern and Southern Teams. Working together, the 89ST and the Northern and Southern Teams aim to identify targeted short- and long-term objectives and milestones for the Northern and Southern Teams’ work on reducing animal-vehicle collisions. The 89ST is also working on a long-term research strategy, which will allow Caltrans to better leverage future funding opportunities.

Insights on Eco-Logical: Caltrans noted the team coordination has been one of the project’s successes to date, particularly through the teams’ successful kick-off meetings and continued strategic discussions. Caltrans documents these successes through summaries of each team meeting to capture updates and share information. Since there is no official agency or entity in charge of the teams, Caltrans has observed challenges in implementing assignments or prioritizing actions, particularly as the teams are not tied to a current Caltrans project. This early coordination, however, provides the teams with a good foundation to respond quickly to emerging problems and to take advantage of new funding opportunities as they arise.

Scoping Natural Heritage Review Website Updates

Missouri Department of Transportation. *Total cost: \$25,000. Schedule: June 2013 – October 2014. AOTR: Mike Ruth.*

Project Goals: MoDOT is developing a MOU with the Missouri Department of Conservation (MDC) that will improve the sharing of natural resource information, integrate transportation and conservation planning, and establish best management practices (BMPs) to protect sensitive species from the impacts of transportation projects.

MDC is currently creating a visioning and scoping document that will outline future updates and expansions for MDC’s Missouri [Natural Heritage Review](#) website, a publicly available site that identifies environmentally sensitive locations of species and/or high-quality communities of conservation concern. Providing integrated natural resource data on the Natural Heritage Review website will enhance the abilities of MoDOT and others to make decisions that conserve natural resources before projects are in the final phases. Among the anticipated website improvements are new data layers and features that will streamline MoDOT’s screening of transportation projects for potential environmental effects and that allow for real-time data updates.

Project Activities and Accomplishments: In January 2014, MoDOT and MDC met with stakeholders from 24 different agencies, including FHWA, USACE, and U.S. Fish and Wildlife Service, to discuss potential improvements to the Natural Heritage Review website. The meeting was the first time that such a large group of stakeholders had met on these issues, and the face-to-face forum fostered productive conversation and strong engagement. Based on forum input, the MoDOT and MDC project team developed a scoping document for website improvements and solicited additional feedback from partner agencies.

“Since our January stakeholder meeting, we noticed agencies communicating more often with each other about data-sharing and potential uses of partner data. The meeting helped partners become more aware of the data that is available.”

- MoDOT staff

Future Steps: In July 2014, MoDOT and MDC met with MDC natural heritage specialists to discuss their own requirements for improvements in further detail. After confirming the scoped technical improvements, MoDOT and MDC will explore funding options to implement these recommendations. The final improvements plan will identify clear steps to improve the website in a way that benefits MoDOT, MDC, and other stakeholders.

MoDOT and MDC are also currently working independently on Best Management Practices (BMPs) and are discussing how the website updates will help disseminate BMPs to different management organizations.

Insights into Eco-Logical: Staffs at both MoDOT and MDC agree that the User Incentive project has strengthened data-sharing communication between their agencies. MoDOT and MDC used their January stakeholder meeting to share information about available data and discussed data challenges such as legal issues or technological data compatibility. Other stakeholder agencies recognize benefits of improving and using the Missouri Natural Heritage Review website, such as a greater availability of data that they can use for their own work. Based on the January meeting and follow-up activities, MoDOT and MDC observed that face-to-face interaction is crucial for engaging and creating excitement among stakeholders, who often have many competing demands.

Implementing a Pilot Project with the New Hampshire Natural Heritage Bureau to Assess Impacts on Wetlands by Roadway Projects

New Hampshire Department of Transportation. *Total cost: \$24,997. Schedule: June 2013 – June 2015. AOTR: Mike Ruth.*

Project Goals: NHDOT is piloting an assessment of wetlands impacted by roadway projects using a standardized wetland assessment methodology known as the Ecological Integrity Assessment (EIA).²⁵ In partnership with the New Hampshire Department of Resources and Economic Development's Natural Heritage Bureau (NHB), NHDOT will compare the EIA to the wetland assessment method it currently uses, the USACE Highway Methodology. A MOU is guiding the cooperation between the two agencies on this project. If the pilot project demonstrates that the EIA is the preferred method for wetland assessments, NHB and NHDOT intend to complete a MOA to guide future wetland assessment and mitigation. The key outcome of this project is a standardized wetland assessment method.

Project Activities and Accomplishments: In October 2013, the NHDOT Bureau of Environment entered into a MOU with NHB for exporting technology, training staff, and developing the pilot wetland mitigation evaluation program. After granting NHDOT access to EIA materials and technology in accordance with the MOU, NHB conducted pre-field training with NHDOT staff between April and June 2014. The training introduced methods for field data collection and provided information on the use of the EIA Scorecard Database and other materials. In addition to NHDOT's work with NHB, the two agencies have been collaborating with the New Hampshire Department of Environmental Services (NHDES) to ensure that the EIA protocol will adhere with the NHDES's permitting regulations.

Future Steps: NHDOT staff began evaluating wetland sites following the EIA methodology in June 2014. NHB provided field EIA training to NHDOT staff from June through October 2014. After the initial field data collection, NHDOT staff conducted field reviews of wetlands to test the EIA method by evaluating sites that are scheduled to be impacted by an upcoming transportation project, as well as one wetland creation site. In winter 2014, NHDOT will work with NHB to draft an analysis report on the EIA approach that will demonstrate findings from the field data collection and training sessions.

Insights on Eco-Logical: NHDOT noted that, like many agencies, it may follow strategies that are similar to the Eco-Logical approach but may not be branded as Eco-Logical. NHDOT and other agencies may be able to increase the level of awareness of the Eco-Logical approach by tapping into existing resources and technical assistance from FHWA. Additionally, NHDOT observed that one potential challenge for the project may be conducting environmental analysis in house. To overcome this challenge, NHDOT plans to build familiarity with botany and ecology through internal training materials based on the training sessions performed by NHB. Finally, one key success of NHDOT's project is its positive working relationship with NHB, which has helped build trust over time.



Figure 9: NHDOT's User Incentive project supports the creation of a standardized wetland assessment method, which could then be used to evaluate sites such as the Pequawket Pond Mitigation Site in Conway, constructed in 2006.

²⁵ EIA is a multi-level protocol for assessing the health of ecosystems developed by NatureServe. For more information, visit: <http://www.natureserve.org/conservation-tools/standards-methods/ecological-integrity-assessment>.

Coordinating State Natural Heritage Database Data

Ohio-Kentucky-Indiana Regional Council of Governments. Total cost: \$24,992. Schedule: June 2013 – July 2014.
AOTR: Mike Ruth.

Project Goals: OKI used User Incentive funding to integrate data from three State Natural Heritage Databases with its Regionally Significant Environmental Resource database to inform the development of its LRTP. With the natural heritage data from each State, OKI prepared a series of maps, produced a summary of the method and criteria used to map the datasets, and drafted a report on how the new data improves understanding of regionally significant environmental resources. OKI also plans to update its project prioritization criteria.

Project Activities and Accomplishments: OKI completed its performance goal to execute a data-sharing agreement with each of the three State agencies and recently completed its final project report. The report addresses how OKI is using the data in its Regionally Significant Environmental Resources and as part of its project prioritization criteria. In addition, OKI created analytical maps based on the new data and a summary of its methodology. OKI will continue to analyze and organize the data to apply to its next LRTP.

OKI's objective was to achieve consistency for the three data-sharing arrangements, and it developed a common agreement template for all of the agencies. OKI then worked with each State agency to tailor the agreement to support State-specific needs or interests. This coordination resulted in a series of agreements that set similar conditions for the sharing, usage, and redistribution of data. The shared basis for the agreements allows OKI to perform consistent kinds and levels of analysis across its entire region. Additionally, some data characteristics provided by one State agency led to OKI requesting similar additions from the other State agencies. For example, one State suggested providing its data using a one-square mile area to define its geography without divulging sensitive information on the species; OKI saw the advantage of mapping data at this scale and worked with the other States to obtain their species information in the same manner.

Future Steps: As OKI has completed its User Incentive activities, it is now beginning to consider how to integrate the project findings into transportation planning and project development, including its Regionally Significant Environmental Resource data. The information from the User Incentive project may allow for more specific descriptions of local environmental assets in the project planning and prioritization process. OKI will soon hold a working session with the Ohio Department of Transportation and the Kentucky Transportation Cabinet to discuss the data obtained through this project and applications for the environmental review process.

In fall 2014, OKI plans to launch an interactive web mapping tool that allows the public to view environmental data on its website. The tool will allow OKI's member communities and other agencies to use this data for other uses, such as land use and green space planning. This effort is part of a wider OKI initiative to communicate planning and environmental information to the public using online maps and social media.

Insights on Eco-Logical: Environmental datasets can be helpful for more than just an MPO's transportation planning responsibilities. The OKI Region's land-use planners, stormwater management agencies, and land trusts and conservancies can also benefit from access to the new data. Local communities and conservation organizations can soon access the data with OKI's online mapping tool. Sharing and communicating data can help agencies realize the co-benefits from Eco-Logical for both the implementing agency and its partners.

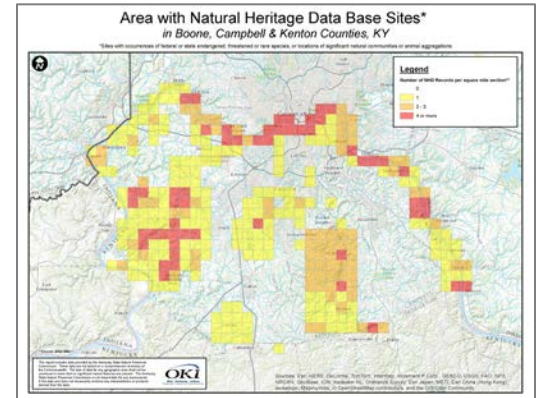


Figure 10: OKI developed a series of maps, like the Area of Natural Heritage Data Base Sites shown here, using natural heritage data from Ohio, Kentucky, and Indiana.

Creating a Regional Open Space Database

Southern California Association of Governments. *Total cost: \$25,000. Schedule: June 2013 – October 2015.*

AOTR: Mike Ruth.

Project Goals: SCAG is developing a regional open space GIS database that will collect and organize plans, programs, studies, and data on open space and biotic resources within its planning area. SCAG is also working on an assessment methodology that will help identify important areas for conservation for use by County Transportation Commissions (CTCs) and local jurisdictions, some of whom are developing their own mitigation programs.

Project Activities and Accomplishments: SCAG's project team developed its open space database and reviewed an initial version in spring 2014. The draft database currently includes approximately 70 datasets. SCAG shared this draft with environmental partners, who provided feedback as well as additional datasets for inclusion. The agency also developed a data gaps report, which highlights areas in the region that may not be covered by particular datasets. SCAG held a workshop in March 2014 about the assessment methodology for using this data to identify the most important areas for conservation and mitigation. The workshop included staff from the CTCs, a primary audience for the methodology, and input from the workshop led to a finalized methodology in summer 2014.

SCAG views the database and its development as a way to build trust among municipalities, CTCs, and other transportation and environmental stakeholders. The agency now has joint work program MOUs with four of the six CTCs in its region, accomplishing a milestone SCAG set for this project. All of these MOUs state that SCAG and the CTC will collaborate on habitat and open space conservation. In addition, some of SCAG's local transportation partners have begun using the GIS database in their planning and project development activities.

Next Steps: In fall 2014, SCAG will hold outreach meetings to share the database and assessment methodology with intended users, including the leadership of all six regional CTCs. SCAG staff will outline possible uses of the tool in upcoming projects such as mitigation for potential high-speed rail development in California.

At these outreach meetings, SCAG will also solicit ideas for how the information can be used in its upcoming 2016 Regional Transportation Plan/Sustainable Community Strategy.

Insights on Eco-Logical: SCAG noted that some local open space programs in its region are already very advanced. The experiences of these existing local programs are helping SCAG develop effective programmatic partnerships with other areas. Eco-Logical data may also provide different benefits for different users. In presenting its work, SCAG tailored its narrative and examples to meet the needs of particular audience. For example, municipalities may be interested in Eco-Logical data that can be used in developing their comprehensive plans, whereas CTCs may prefer to focus on the benefits the Eco-Logical approach can provide to project development.

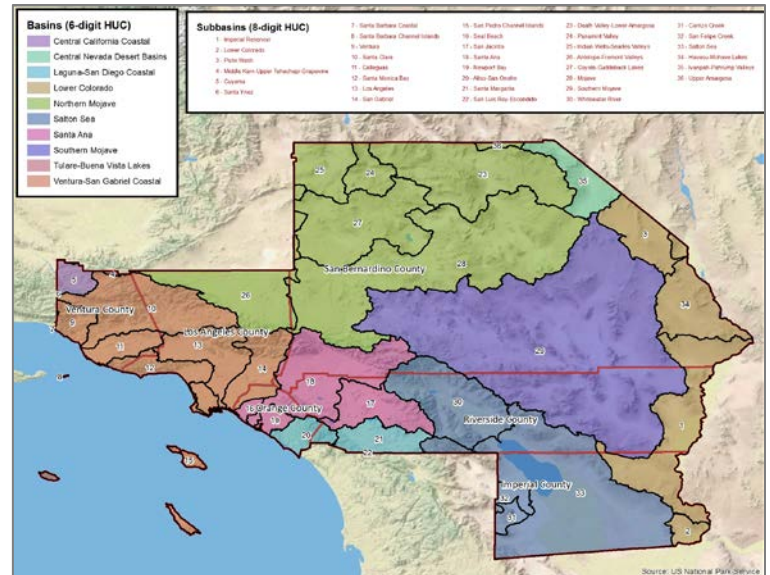


Figure 11: SCAG's User Incentive project focuses on the development of a regional open space GIS database, including maps of the region.

Appendix B. Eco-Logical Grant Project Summaries

The following section contains a brief summary of the completed Eco-Logical grant projects. For a more detailed description of the projects, refer to the [2012 Eco-Logical Grant Program Annual Report](#).

List of Projects

1. [Colorado Department of Transportation \(CDOT\)](#): Developing a Regional Ecosystem Framework for Terrestrial and Aquatic Resources along the I-70 Corridor: An Eco-Logical Field Test
2. [Chicago DOT](#): Sustainable Infrastructure Standards for Urban Ecology
3. [Tri-County Regional Planning Commission \(TCRPC\)](#): Regional Transportation, Ecosystem, and Land-Use Integration Plan
4. [Mid-America Regional Council \(MARC\)](#): An Eco-Logical Approach to Transportation Planning in the Kansas City Region
5. [Tioga County Soil and Water Conservation District \(TCSWCD\)](#): Providing Opportunities for Highway Programs to Remediate Natural Resource Concerns in New York
6. [New Hampshire Audubon \(NHA\)](#): Creating Tools to Support Integrated Transportation and Resource Planning in New Hampshire
7. [Land-of-Sky Regional Council \(LOSRC\)](#): Linking Lands and Communities in the Land-of-Sky Region of Western North Carolina
8. [North Carolina Department of Environment and Natural Resources \(NCDENR\)](#): Integration of North Carolina's Conservation and Transportation Planning
9. [Oregon State University \(OSU\)](#): Using the Eco-Logical Approach to Develop and Implement Conservation and Mitigation Priorities for Oregon
10. [Capital Area Council of Governments \(CAPCOG\)](#): Central Texas Greenprint for Growth: A Tool for Balancing Sustainable Conservation Goals with the Infrastructure Needs of Our Rapidly Urbanizing Region
11. [Houston-Galveston Area Council of Governments \(H-GAC\)](#): Developing a Regional Decision Support System for the Houston-Galveston Region
12. [North Central Texas Council of Governments \(NCTCOG\)](#): North Central Texas Regional Ecological Framework
13. [Envision Utah](#): Blueprint Jordan River, A Lake-to-Lake Vision
14. [Thomas Jefferson Planning District Commission \(TJPDC\)](#): Integrating Green Infrastructure and Transportation Planning
15. [United States Environmental Protection Agency \(EPA\) Region 6](#): A Regional Ecological Assessment Protocol (REAP) for the South Central United States

Developing a REF for Terrestrial and Aquatic Resources along the I-70 Corridor: An Eco-Logical Field Test

Colorado Department of Transportation. *Period of performance:* May 22, 2008 – September 22, 2011. *Grant project website:* <http://i-70wildlifewatch.org>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the CDOT Eco-Logical grant project was to identify mitigation projects to improve wildlife connectivity for the Interstate 70 (I-70) corridor. To achieve this goal, CDOT staff collaborated with a group of partner agencies to draft a Programmatic Environmental Impact Statement to cover projects in the corridor and established an MOU for [A Landscape Level Inventory of Valued Ecosystem Components](#), a CDOT-led interagency program that promotes environmental streamlining in the I-70 corridor. CDOT and its partners also created an REF matrix for the corridor that incorporates wildlife habitat and crossing data into a GIS database to help CDOT implement projects along the corridor. CDOT successfully tested the REF matrix on a small project in the corridor and plans to apply it for future I-70 corridor projects.

Sustainable Infrastructure Standards for Urban Ecology

Chicago Department of Transportation. *Period of performance:* August 22, 2008 – December 16, 2011.

Grant project website: <http://egov.cityofchicago.org/city/webportal/home.do>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The Chicago DOT Eco-Logical grant project supported outreach and education activities related to the agency's construction of a sustainable streetscape pilot in the Pilsen neighborhood of Chicago using Leadership in Energy and Environmental Design (LEED) principles and featuring sustainable elements such as stormwater catchments and solar-powered streetlights. The project resulted in the creation of a sustainable design manual, a series of educational kiosks, and other products that inform regional governments and the public about the benefits of sustainable infrastructure investment. The project has improved awareness of sustainable urban infrastructure in the Pilsen community and has opened up new markets for sustainable technologies by demonstrating their utility.

Regional Transportation, Ecosystem, and Land-Use Integration Plan

Tri-County Regional Planning Commission (Illinois). *Period of performance:* April 4, 2008 – April 4, 2010. *Grant project website:* <http://www.tricountyrpc.org/>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the TCRPC Eco-Logical grant project was to complete an integrated planning document known as "The Big Plan," which developed strategies for improving the sustainability of the transportation system with respect to ecosystems in the Peoria, Illinois region. The Big Plan, which TCRPC completed in 2010, includes regional priorities and strategies for land-use and infrastructure development, policy concepts, GIS-based scenario-planning models, and technical implementation. The Big Plan put forth a regional vision focused on five themes: agricultural preservation, balanced growth, economic development, environmental stewardship, and transportation infrastructure. TCRPC's grant project helped it move forward in establishing a collaborative culture across jurisdictions and disciplines. By thinking more regionally, TCRPC was able to bring community leaders and transportation and land-use planners together to involve a broader range of stakeholders in the planning process.

An Eco-Logical Approach to Transportation Planning in the Kansas City Region

Mid-America Regional Council. *Period of performance:* March 18, 2008 – March 18, 2010. *Grant project website:* <http://www.marc.org/transportation/conservation.htm>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The MARC Eco-Logical grant project sought to build a framework for an efficient and sustainable transportation system in the Greater Kansas City region. As part of the project, MARC developed an Action Plan with the goals of formalizing collaboration with regional partners, creating a regional mitigation strategy, and aligning transportation decisionmaking with a regional sustainability vision. MARC's board of directors adopted the Action Plan in 2009. MARC staff then worked with an Action Plan Advisory Group to integrate the Action Plan into its 2040 LRTP, which was adopted in 2010. The plan includes policy direction related to climate protection, energy, and natural resource conservation measures through future transportation investments. MARC staff also revised project selection criteria for the agency's planning and programming processes to include environmental considerations. Ultimately, the Eco-Logical grant project encouraged MARC to build stronger local processes and to consider environmental data earlier in the transportation planning process. In 2013, MARC completed a new \$2.5 million, remote-sensing based, geospatial land cover dataset for the Kansas City region. The regional natural resources inventory provides a basis for future regional mitigation and restoration planning. This work is embedded within the context of more proactive, integrated land use, transportation, and environmental planning.

Providing Opportunities for Highway Programs to Remediate Natural Resource Concerns in New York

Tioga County Soil and Water Conservation District. *Period of performance:* March 4, 2008 – December 2012. *Grant project website:* <http://www.u-s-c.org/html/Ecological/Ecological.html>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the TCSWCD Eco-Logical grant project was to work with the FHWA New York Division Office and New York State DOT (NYSDOT) staff to develop an REF, consisting of natural resource maps covering the county's watersheds. The project team also assisted in developing an in-lieu fee program in the Upper Susquehanna River Basin, which has helped implement the REF. In 2012, the TCSWCD completed the first version of an online mapping tool for its REF and drafted a report on the project, which details conservation opportunities for a range of "keystone species" within the Susquehanna Basin. The report and the REF enable environmental planners at NYSDOT to consider habitats that may otherwise fall outside the scope of the transportation planning process. As a result of this project, transportation agencies such as NYSDOT can manage and fund one collective mitigation site for multiple transportation projects by purchasing credits for a transportation project and then selecting a high-priority mitigation site, as identified in the REF, to mitigate impacts from several different transportation projects.

Creating Tools to Support Integrated Transportation and Resource Planning in New Hampshire

New Hampshire Audubon. *Period of performance:* September 1, 2008 – April 30, 2010. *Grant project website:* <http://www.nhaudubon.org/index.php>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

NHA used part of its Eco-Logical grant to develop a GIS-based wildlife connectivity framework to integrate transportation and land-use planning by evaluating the impact of transportation projects on wildlife species. To create the model, NHA and the New Hampshire Fish and Game Department convened an interagency working group that developed an impact assessment framework that rated the resistance for 16 wildlife species by measuring how natural and unnatural barriers impacted the species' abilities to move across the landscape. The

dataset for the connectivity model is now available on the [NH Statewide GIS website](#) for anyone with access to GIS software. MPOs and Regional Planning Associations can use this model and framework for environmental screening of transportation projects before they submit their projects to the New Hampshire Department of Transportation.

Linking Lands and Communities in the Land-of-Sky Region

Land-of-Sky Regional Council (Western North Carolina). *Period of performance:* March 17, 2008 – March 17, 2010. *Grant project website:* <http://www.linkinglands.org/>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the LOSRC Eco-Logical grant project was to develop a green infrastructure framework to identify priority ecological resources and areas suited for future development in a four-county region of Western North Carolina. As part of this project, LOSRC created several publicly available resource maps and datasets that address water quality, agricultural suitability, wildlife habitat, and biodiversity. Using GIS data and spatial data integration tools, LOSRC also developed resource assessments and a Regional Green Infrastructure Network map. The agency incorporated information and maps from the Green Infrastructure Network into the “Environmental Analysis” chapter of its LRTP, as well as [GroWNC](#), a three-year regional planning initiative supported by U.S. Department of Housing and Urban Development grant funds. GroWNC used the Eco-Logical grant project tools and maps to prepare scenarios that present possible future scenarios related to economic growth and land development patterns for Western North Carolina.

Integration of North Carolina’s Conservation and Transportation Planning

North Carolina Department of Environment and Natural Resources. *Period of performance:* April 3, 2008 – April 30, 2010. *Grant project website:* www.conservationtool.nc.gov.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the NCDENR Eco-Logical grant project was to produce data for a strategic conservation planning tool for North Carolina, which required the development of data to help enhance the State Wildlife Action Plan and other conservation efforts by identifying high-priority, un-fragmented wildlife habitats based on occurrence data for indicator species and digital aerial photography. The project also resulted in improved cultural resource data. The data developed during this project are included in the [NC Conservation Planning Tool](#) (CPT), a comprehensive statewide conservation-planning tool used by a variety of government agencies, regional councils of governments, conservation organizations, and other partners to inform planning and decisionmaking for land use, conservation, watershed, parks and recreation, and transportation projects. The data developed during this project became an integral part of the North Carolina Wildlife Resources Commission’s [Green Growth Toolbox](#), which offers technical assistance, training workshops, and GIS data to local governments to support activities that encourage “nature-friendly” development to better conserve wildlife and natural resources. Overall, NCDENR used its Eco-Logical grant project to improve the integration of conservation data into transportation planning processes at the North Carolina Department of Transportation (NCDOT), MPOs, and rural planning organizations in North Carolina. NCDENR is currently working with the NCDOT on an Interagency Coordination Protocol initiative that will provide documented guidance to transportation planners across the State to better utilize the CPT and other conservation data in long-range transportation planning.

Using the Eco-Logical Approach to Develop and Implement Conservation and Mitigation Priorities for Oregon

Oregon State University. *Period of performance:* June 11, 2008 – February 11, 2010. *Grant project website:* <http://orbic.pdx.edu/>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

OSU used its Eco-Logical grant to identify Oregon’s conservation priority areas and to consolidate disparate data from different regions of the State into an online REF tool. Now complete, the REF helps agencies throughout the State plan conservation efforts associated with transportation projects. In particular, the REF’s online tool allows agencies to characterize projects relative to conservation priority areas. In response to the project, the EPA, the Oregon Department of State Lands, and the Oregon Department of Environmental Quality informally agreed to adopt OSU’s methods to identify and implement important wetland mitigation sites, and are supporting the development and maintenance of the [Oregon Wetlands Explorer](#) to provide easy access to this information. As a result of the project, the Oregon Department of Transportation and other State agencies are working to integrate the Eco-Logical approach into streamlining communications and project reviews between environmental and transportation agencies. In addition, as a result of the work on this project, OSU’s Institute for Natural Resources has gone on to help FHWA and TRB develop a number of additional Eco-Logical implementation tools, including a 2014 project to assist in designing crediting frameworks for transportation agencies.

Central Texas Greenprint for Growth: A Tool for Balancing Sustainable Conservation Goals with the Infrastructure Needs of Our Rapidly Urbanizing Region

Capital Area Council of Governments. *Period of performance:* May 16, 2008 – May 16, 2010. *Grant project website:* <http://www.capcog.org/>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

Using its Eco-Logical grant funding, CAPCOG created a “greenprint” for the Central Texas region to help planners and transportation agencies plan for future growth. With input from regional and local stakeholder groups, CAPCOG’s Greenprint for Growth plan prioritized the protection of water quality, ecological resources, farm and ranch lands, recreational and cultural resources, and scenic corridors. Greenprint for Growth integrates data into a GIS model that prioritizes conservation opportunities and displays them in a series of maps, which are available on the Greenprint [website](#). CAPCOG’s work encouraged the counties and cities within its planning area to consider environmental effects earlier in the transportation planning process.

Developing a Regional Decision-Support System for the Houston-Galveston Region

Houston-Galveston Area Council. *Period of performance:* March 14, 2008 – June 14, 2010. *Grant project website:* <http://www.h-gac.com/community/environmental-stewardship/eco-logical/default.aspx>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the H-GAC Eco-Logical grant project was to create a GIS-based product, known as the Eco-Logical tool, to identify environmental resource priority areas. H-GAC completed all necessary resource mapping and published a web-based, interactive [Eco-Logical tool](#) in 2010. The tool fills a regional need to balance growth with natural resource conservation, and allows for transportation planners to consider environmental impacts in the project prioritization process. Since completing the project, H-GAC developed several mechanisms to promote local government and NGO use of the tool within the region, including a brochure for local governments, an interactive website, and a smartphone application. H-GAC’s final report documents the methodology for developing the Eco-Logical tool, which other local or regional government agencies could replicate.

North Central Texas Regional Ecosystem Framework

North Central Texas Council of Governments. *Period of performance:* May 9, 2008 – June 9, 2011. *Grant project website:* www.nctcog.org/ref.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goals of NCTCOG's Eco-Logical grant project were to develop a REF to help agencies assess environmental impacts of proposed infrastructure projects and to enhance multi-agency understanding of critical resource-protection areas. To develop the REF, NCTCOG analyzed and aggregated GIS data developed by EPA Region 6's Eco-Logical grant project to the subwatershed level for the entire metropolitan planning area. As a result of the data and analysis capabilities contained in the REF, NCTCOG was able to devote a chapter of its 2011 Metropolitan Transportation Plan to environmental considerations. The products of NCTCOG's grant project are currently supporting the agency's IAP Lead Adopter project, through which the agency is updating and applying the REF.

Blueprint Jordan River: A Lake-to-Lake Vision

Envision Utah. *Period of performance:* June 9, 2008 – June 9, 2009. *Grant project website:*

<http://www.blueprintjordanriver.slco.org/index.html>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the Blueprint Jordan River Eco-Logical grant project was to develop a collective vision for the Jordan River corridor that integrated transportation planning and natural resource restoration. The project team collaborated with the community, local government, and State and Federal agencies to carry out the grant project. As a result of the collaboration, the project team, coordinated by the public-private partnership [Envision Utah](#), produced the [Blueprint Jordan River](#) vision document to guide development and restoration along the Jordan River. With the Blueprint complete, Envision Utah helped Salt Lake County establish an interim planning committee. This committee then formally created the [Jordan River Commission](#) in 2010, which currently oversees implementation of the Blueprint's vision. The Commission supports projects across the region that uphold the Blueprint vision, such as the completion of the Jordan River Trail. Envision Utah has also integrated Eco-Logical principles into other projects, such as [Wasatch Canyons Tomorrow](#), which addresses transportation challenges and environmental impacts unique to the canyons of the Wasatch Mountains.

Integrating Green Infrastructure and Transportation Planning

Thomas Jefferson Planning District Commission (Virginia). *Period of performance:* May 20, 2008 – May 20, 2011. *Grant project website:* www.tjpd.org/ecological.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

The goal of the Thomas Jefferson Planning District Commission Eco-Logical grant project was to develop a green infrastructure plan that integrates transportation, development, and natural resource plans in the five-county planning district. To achieve this goal, the project team developed two GIS-based methodologies to help transportation planners prioritize mitigation projects for streams and wetlands based on potential environmental impacts. TJPDC also created a "Least Environmental Cost Analysis" framework to use in developing alternatives in construction projects. TJPDC provided the resulting framework to numerous local and State transportation and environmental agencies. CAMPO, which is located within TJPDC, is currently using data from the framework to establish a weighted ranking system for evaluating the impacts of the proposed project alternatives on ecosystem and recreation resources connected to the Rivanna River watershed, as part of its IAP Lead Adopter project.

A Regional Ecological Assessment Protocol for the South Central United States

U.S. Environmental Protection Agency, Region 6. *Period of performance:* May 1, 2008 – April 10, 2011. *Grant project website:* <http://www.epa.gov/region6/index.htm>.

For more information, refer to the 2012 Eco-Logical Grant Program Annual Report [project summary](#).

EPA Region 6 developed a Regional Ecological Assessment Protocol (REAP) that uses GIS analysis to classify land on the basis of its ecological significance. This project expanded upon the Texas Ecological Assessment Protocol, which collected and analyzed data for the State of Texas. The REAP now includes all five States in Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas). All MPOs in those States have access to the REAP, and EPA reports that planners have used the REAP to identify potential impacts of and mitigation for transportation projects in early planning.

Appendix C. Implementing Eco-Logical IAP Interview Questions

In May and June 2014, FHWA and the Volpe Center project team conducted approximately 60-minute discussions with Implementing Eco-Logical IAP recipients. The following questions were used to guide these discussions.

Project Status and Activities

- A. Please briefly describe the current status of your Implementing Eco-Logical IAP project and any significant activities related to the project over the past year.
- B. What have been the most successful elements of your Implementing Eco-Logical IAP project to date?
- C. What challenges, if any, have delayed or adversely affected the development of your Implementing Eco-Logical project over the past year?
- D. What tools or resources have been critical to the progress and implementation of your project? Would you suggest that any of these be shared with other DOTs or MPOs that are also implementing Eco-Logical?
- E. When do you expect to complete your Implementing Eco-Logical project? What are your planned next steps and upcoming milestones for the project? Do you consider your next steps to have any specific challenges?

Performance Measures and Deliverables

Focus Area	Performance Measure	December 2013 Status
REF in decisionmaking	<i>Performance Measure #1</i>	<i>Performance Measure Status</i>
Integration of planning and decisionmaking between agencies	<i>Performance Measure #2</i>	<i>Performance Measure Status</i>
Agency culture and management adoption	<i>Performance Measure #3</i>	<i>Performance Measure Status</i>

- F. What is the status of the performance measure(s) developed during your initial kick-off call, as listed above?
- G. What next steps do you plan to take toward the completion of each performance measure?
- H. How has your thinking about your performance measures changed in any way since your initial kick-off call? Have you changed or reconsidered the approach or the target for any of your measures? If so, why?

REF in Decisionmaking

- I. Have you seen a shift in how decisions are made within your agency based upon your REF or Implementing Eco-Logical project? Among partner agencies? Within the region?
- J. What practices or next steps have you found, or do you think would be useful in integrating the REF or Eco-Logical approach into your agency's decisionmaking processes?

Project Partners and External Communications

- K. How have you worked with partners since the start of your Implementing Eco-Logical project? Have new partnerships or unanticipated challenges emerged?
- L. What outreach forums, materials, or strategies (e.g., meetings, brochures, presentations, etc.) have you found helpful in promoting your Implementing Eco-Logical project?

Incorporating the Eco-Logical Approach into Agency Culture and Management

- M. Has the level of awareness about your Implementing Eco-Logical project changed in your agency since last summer, particularly with staff not directly involved in the project?
- N. What steps are you taking, or do you anticipate taking to further integrate the Eco-Logical approach into "business-as-usual" practices within your agency?

Evaluating the Implementing Eco-Logical Assistance Funding Program

- O. What type of support from FHWA would be helpful to you as you continue your Implementing Eco-Logical project (e.g., webinars, guidance materials, targeted expertise, coordination, workshops, etc.)? May something be useful pertaining to any challenges in your 'next steps,' as outlined in Question E?
- P. Do you have any other suggestions or feedback for FHWA regarding Implementing Eco-Logical?

Additional questions asked of Implementing Eco-Logical IAP recipients that also participated in the Eco-Logical Grant Program were as follows:

Perspectives on Participation in Implementing Eco-Logical and Eco-Logical Grant Program

- Q. How does your Implementing Eco-Logical project relate to your prior Eco-Logical grant project? What differences, if any, have you observed between the projects or processes used for each project?
- R. What lessons have you applied to your Implementing Eco-Logical project from your experiences as an Eco-Logical grant recipient?
- S. What advice or recommendations would you offer agencies interested in using the Eco-Logical approach that are potentially facing challenges related to partnerships, data-sharing, agency resources, etc.? Would you be interested in sharing these with other MPOs or DOTs as part of a peer exchange?

Appendix D. Eco-Logical Grant Program Questionnaire

FHWA and the Volpe Center project team used an electronic questionnaire to collect perspectives from the Eco-Logical grant recipient on the Eco-Logical approach and on how their participation in the Eco-Logical Grant Program impacted their agencies' activities. Nine of the 15 Eco-Logical grant recipients provided responses to the Eco-Logical Grant Program questionnaire:

- Chicago DOT
- EPA Region 6
- HGAC
- LOSRC
- MARC
- NHA
- OSU
- TCSWCD
- TCRPC

The following questionnaire was shared with grant recipients. As NCTCOG and CAMPO are current IAP recipients, FHWA and the Volpe Center project team conducted discussions with them to collect project updates.

The FHWA Office of Project Development and Environmental Review prepares an annual report each calendar year (CY) to provide updates about its Eco-Logical Grant Program. The CY2013 report will address both the Eco-Logical Grant Program and FHWA's Implementing Eco-Logical Funding Assistance Program supported through SHRP2. Information about the SHRP2 Implementing Eco-Logical initiative is available at:

http://www.environment.fhwa.dot.gov/ecological/eco_implementing.asp.

As an Eco-Logical Grant Program recipient, FHWA is interested in hearing your perspectives on how your participation in the program has influenced your agency's activities. While some of these questions may look familiar to you, we hope to learn how your perspectives have evolved since the completion of your grant project, focusing on activities that have occurred since December 2012.

Grantee Information

- A. Please provide your name and organization.

Status and Activities

- B. Please briefly describe the updated status of your Eco-Logical grant project and any significant activities related to the project since December 2012. To view the most recent information we have on your project, please visit the FHWA Eco-Logical [website](#).
- C. Do you plan to continue working on your Eco-Logical grant project in the future?
- a. Yes
 - b. No

(IF YES TO QUESTION C): What are your planned next steps beyond what you have already accomplished in your Eco-Logical grant project?

- D. Are any of your partner organizations still active in your Eco-Logical project, or have they currently used products of the project since December 2012?
- a. Yes
 - b. No

(IF YES TO QUESTION D): Which project partners remain active in your project or are currently using grant products (e.g., reports, data, tools, etc.)?

- E. Has your Eco-Logical final product (e.g., Regional Ecological Framework, plans, data, tools, etc.) been applied to transportation plans or projects since December 2012?
 - a. Yes
 - b. No

(IF YES TO QUESTION E): Please identify the transportation plans or projects to which your Eco-Logical product has been applied.

- F. Have you been able to measure the benefits of your Eco-Logical grant project, whether quantitatively or qualitatively, for planning, NEPA, and/or permitting processes?
 - a. Yes
 - b. No

(IF YES TO QUESTION F): Please explain the measurable benefits you have found for planning, NEPA, and/or permitting processes.

Integrating the Eco-Logical Approach into Agency Practices

- G. How has your agency changed its use of the Eco-Logical approach since the beginning of your period of performance?
- H. What steps or processes did you find to be the most effective in encouraging the Eco-Logical approach among stakeholder agencies in your region?
- I. To what degree are products from your Eco-Logical project integrated into your organization's decisionmaking processes?
 - a. Very well integrated
 - b. Integrated
 - c. Somewhat integrated
 - d. Not at all integrated
 - e. Other

(FOR ALL ANSWERS): Please explain answer selection.

- J. How would you characterize Eco-Logical's staying power within your organization?
 - a. Strong
 - b. Moderate
 - c. Limited
 - d. Other

(FOR ALL ANSWERS): Please explain answer selection.

- K. How would you characterize Eco-Logical's staying power within other organizations in your region?
- a. Strong
 - b. Moderate
 - c. Limited
 - d. Other

(FOR ALL ANSWERS): Please explain answer selection.

- L. How would you characterize the general level of awareness about the Eco-Logical approach and the outcomes of your Eco-Logical project among staff in your agency?
- a. Strong
 - b. Moderate
 - c. Limited
 - d. Other

(FOR ALL ANSWERS): Please explain answer selection.

- M. What, if any, funding or personnel resources are available at your agency to support ongoing Eco-Logical implementation efforts?
- a. Funding resources
 - i. If yes, please explain.
 - b. Personnel resources
 - i. If yes, please explain.
 - c. Other resources
 - i. If yes, please explain.
 - d. Limited resources or no resources available

Other Comments

- N. In hindsight, what have been the benefits from your Eco-Logical grant project that continue to bring value to your organization, staff, and/or region?
- O. Looking back, what were the biggest challenges you faced in your Eco-Logical grant project, and how did you address and overcome these challenges?
- P. Based on your experiences, what advice or recommendations would you offer to agencies interested in using the Eco-Logical approach and potentially facing challenges related to partnerships, data-sharing, agency resources, etc.?
- Q. Have you recently presented your Eco-Logical grant project or shared information about it in a public forum?
- a. Yes
 - i. If yes, please explain.
 - b. No
- R. How can FHWA continue to support past and future projects and programs advancing the Eco-Logical approach?