ECO-LOGICAL GRANT RECIPIENT PEER EXCHANGE REPORT

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Prepared for:
Office of Project Development and Environmental Review
Federal Highway Administration
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Prepared by:
Transportation Policy and Planning
John A. Volpe National Transportation Systems Center
Research and Innovative Technology Administration
U.S. Department of Transportation

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OVERVIEW

On March 21-22, 2012, the Federal Highway Administration (FHWA) Office of Project Development and Environmental Review sponsored a two-day peer exchange to convene recipients of FHWA Eco-Logical grants whose projects achieved noteworthy accomplishments during the initial grant period and who demonstrated potential to replicate components of their project, promote further adoption of Eco-Logical by partner agencies, or test additional components of the Eco-Logical approach. FHWA hosted the peer exchange at the United States Department of Transportation (U.S. DOT) Headquarters in Washington, D.C, and participants included staff from the Bureau of Land Management (BLM), Chicago Department of Transportation (DOT), Colorado DOT, U.S. Environmental Protection Agency (EPA) Region 6, FHWA, Houston-Galveston Area Council (H-GAC), Thomas Jefferson Planning District Council (TJPDC), Transportation Research Board (TRB), FHWA Office of Project Development and Environmental Review, FHWA Office of Planning and the U.S. DOT Volpe National Transportation Systems Center.

The purpose of the peer exchange was to better understand effective and replicable implementation strategies, document the next steps of the targeted grant recipients' projects, and determine specific funding needs of grant recipients to further implement the Eco-Logical approach. The participants in the peer exchange also discussed lessons learned and challenges faced while implementing their grant projects. This report summarizes the presentations given and the discussions that followed. It is expected that this document will be a resource for FHWA in determining the direction of the Eco-Logical grant Program and for identifying methods that may be useful for expanding the adoption of the Eco-Logical approach on a national scale.

The peer exchange provided FHWA with an opportunity to examine the issues discussed in the *2011 Eco-Logical Grant Program Annual Report (Annual Report)* in greater detail. In-depth conversations amongst the grant recipients during the course of the peer exchange provided a more comprehensive understanding of the challenges and successes faced by the grant recipients. This report builds upon the findings and recommendations made in the *Annual Report*.

Background of the FHWA Eco-Logical Program and the Eco-Logical Grant Program

The development of infrastructure facilities can adversely impact ecosystems by disrupting wildlife connectivity, degrading plant and animal habitats, and damaging watersheds. Past approaches to avoid, minimize, and mitigate adverse impacts on natural resources may not have always provided sustainable environmental outcomes. An interagency steering team created a process for developing infrastructure that is sensitive to wildlife habitat and can enhance ecosystem sustainability, which was documented in the 2006 publication of *Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects (Eco-Logical). Eco-Logical* encourages flexibility in regulatory processes under existing authorities. Specifically**,** it sets forth a conceptual framework for integrating plans and data across agency and disciplinary boundaries and endorses ecosystem-based mitigation.

The FHWA Office of Planning, Environment, and Realty developed and established the Eco-Logical grant program in 2007. FHWA provided a total of approximately $1.4 million in funding to the 15 selected projects. Project activities included planning, data collection and analysis, mitigation, public education for sustainable streets, and prioritization of natural and cultural resources. FHWA required grant recipients to provide matching funds greater than or equal to 50 percent of project costs. The grant

performance periods ranged from 12 to 40 months. Nine of the grant recipients completed their projects prior to Calendar Year (CY) 2011, four grant recipients completed their projects in CY11, and two will complete their projects in CY12.

Presentations

Welcome, Introductions, and Overview
Gerry Solomon, FHWA Office of Project Development and Environmental Review
Jim Cheatham, FHWA Office of Planning
Shari Schaftlein, FHWA Office of Project Development and Environmental Review

Mr. Solomon began the peer exchange by reinforcing FHWA's commitment to the Eco-Logical approach, as well as the collective commitment of the document's signatory agencies that most recently convened to discuss Eco-Logical in January 2012. Eco-Logical complements other FHWA programs that encourage streamlined project delivery, including Every Day Counts. The knowledge shared at this peer exchange will inform the future of and improvements to the Eco-Logical approach.

Mr. Cheatham, Director of the Office of Planning, discussed the links between Eco-Logical and Planning and Environmental Linkages, emphasizing that earlier consideration and integration of environmental concerns into a project expedites delivery.

Ms. Schaftlein spoke to the future of the Eco-Logical grant program, specifically mentioning the potential for additional peer exchanges and rounds of grant funding. The Eco-Logical program is partnering with the Transportation Research Board (TRB) and the Strategic Highway Research Program 2 (SHRP2) to support a recent request for proposals to develop an integrated, geospatial ecological screening tool for early transportation planning that operates in a web service environment and leverages much of its data and perhaps analytical capabilities from existing tools.

EPA Region 6
Sharon Osowski

EPA Region 6 is headquartered in Dallas, Texas and encompasses a five-state region that includes Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, as well as 66 tribes. EPA Region 6 developed the Regional Ecological Assessment Protocol (REAP) that uses a Geographic Information System (GIS) analysis to classify land on the basis of its ecological significance. This project expands on the Texas Ecological Assessment Protocol (TEAP), which collected and analyzed data for the State of Texas. EPA Region 6 completed data collection for the REAP in 2011. While most of the data in the REAP are subsets of national datasets, EPA Region 6 staff also worked with State wildlife agencies to acquire coarse rare species data to aggregate into the model.

In order to increase the tool's accessibility, EPA Region 6 incorporated the REAP into the National Environmental Policy Act (NEPA) Assist Tool (NEPAssist), expanding usage among NEPA practitioners and improving the transportation planning process. NEPAssist is password protected, but does have a widespread user base, both nationally and internationally. Currently, all Texas Metropolitan Planning Organizations (MPOs) have access to the tool, and REAP trainings are underway in Arkansas and New Mexico. Oklahoma and Louisiana MPOs have not formally expressed interest in working with the REAP, but some representatives from these States have attended the webinar trainings on the tool.

EPA Region 6 staff plans to continue promoting the REAP and related GIS tools at conferences and among MPOs and State regulatory agencies to attract the executive-level commitment believed necessary

for the tool's full adoption. The tool has not been replicated in other EPA regions, but MPOs in other EPA regions have inquired about how to establish REAPs in their own areas. States could replicate the REAP by following Region 6's methodology and programming information. EPA Region 6 staff encourages leadership commitment to support the capacities needed for the implementation of REAP, which are GIS expertise, funding, and staff availability.

With additional funding, EPA Region 6 would expand the REAP to a national scale. As the REAP is already integrated into NEPAssist, expanding the ecosystem assessment protocol to cover the other EPA regions would make the tool immediately accessible to NEPA practitioners nationwide upon its completion. Other near-term goals include acquiring and incorporating more comprehensive data from Tribal lands into the REAP, creating tablet computer applications for NEPAssist to increase accessibility in the field, and adapting the REAP for automated program and GIS data updates.

TJPDC
Steven Williams

The goal of the TJPDC Eco-Logical grant was to develop a green infrastructure plan that integrated transportation, development, and natural resource plans in this five-county planning district. TJDPC staff created four tools to help local governments prioritize projects based on potential environmental impacts during the Long-Range Transportation Plan (LRTP) process:
1. Regional Ecosystem Framework (REF) – an inventory of resources of regional significance;
2. Integrated Regional Map – a tool that summarizes potential environmental impacts of projects recommended in LRTPs;
3. Least Environmental Cost Analysis – a framework to use in developing alternatives in construction projects; and
4. Prioritized Mitigation Sites – strategically identified mitigation sites that enhance the REF, ensuring that the maximum ecological benefit is achieved per mitigation dollar spent.

TJPDC anticipates strong interest from local governments and plans to work closely with them to help them adopt the Eco-Logical products for use. TJPDC expects a range of users, as the mitigation priorities identified by the tools are practical to not only transportation planning project prioritization, but also to land-use planning and stormwater management. TJPDC's methodology is easily replicable due to its flexibility in accommodating various types of datasets. Jurisdictions adopting the tool for their own use can weigh different datasets according to their local needs and priorities. Though local governments have been receptive to TJPDC's REF and other tools, the Virginia DOT (VDOT) has neither endorsed nor participated in the project's implementation.

TJPDC anticipates that considering the range of NEPA factors early will be both cost and time effective during the environmental review process. With additional funding, TJPDC would incorporate a broader range of metrics into the REF, including not only environmental considerations, but aesthetic, cultural, historical, and economic factors as well. Creating a more comprehensive tool will allow planners to evaluate the potential impacts of a proposed project on each of these categories during the creation of LRTPs and in the project prioritization process. TJPDC recently received a Department of Housing and Urban Development (HUD) Sustainability grant and has continued work on the Eco-Logical grant products through this HUD grant.

Colorado DOT
Peter Kozinski

The Colorado DOT Eco-Logical grant funded an REF for the Interstate 70 (I-70) corridor that incorporates wildlife-habitat and crossing data into a GIS database. Colorado DOT staff identified 17 priority connectivity zones for wildlife and important aquatic crossings along the I-70 corridor. They then created an implementation matrix for the REF that integrates proposed project data and analysis.

Throughout the project, Colorado DOT met annually with a multi-agency stakeholder group. In January 2011, project partners committed to use the matrix to implement future projects proposed along the corridor by amending a Memorandum of Understanding (MOU) associated with the Stream Wetland Ecological Enhancement Program. Colorado DOT also developed and signed a second MOU for A Landscape Level Inventory of Valued Ecosystem Components to promote environmental streamlining along the I-70 corridor. Through the formation and signing of these MOUs, Colorado DOT established and affirmed partnerships with several local stakeholders.

The project team plans to utilize the data on wildlife connectivity to influence transportation project design and placement, and the State Transportation Improvement Program process as projects and funding become available. The Colorado DOT project's implementation matrix and MOUs helped facilitate collaboration and commitment to Context Sensitive Solutions among the project partners.

With additional funding, Colorado DOT would explore evaluating the cost savings of utilizing the Eco-Logical approach. Demonstrating that incorporating Eco-Logical principles is cost effective and a good business practice will reassure upper management and potential project partners that the approach is economically practical as well as environmentally-conscious.

H-GAC
Meredith Dang

H-GAC is the MPO for an eight-county metropolitan area and the Council of Governments for a thirteen-county region. Most of the region has a low-density development pattern, but projected population growth will likely require new considerations for growth management and planning. H-GAC aims to be a leader in shaping regional growth, balancing the expected population boom with protection of the region's natural resources.

The goal of the H-GAC Eco-Logical project was to create a GIS tool, known as the Eco-Logical tool, to identify environmental resource priority areas within the eight-county metropolitan area. This product serves a regional need to balance development with natural resources conservation, and allows for transportation planners to consider environmental impacts in the project prioritization process. In creating this tool, the project team aimed to develop a methodology that could be replicated in other regions. H-GAC completed all resource mapping for eight counties and published a web-based interactive Eco-Logical tool in June 2010. Since completing the project, H-GAC has developed several mechanisms to promote local government and non-governmental organization (NGO) use of the tool within the region, including a brochure for local governments, an interactive website, and an iPhone application. The Eco-Logical tool currently receives about 100 unique users each month.

H-GAC works with many of the same partners on different projects, and re-engaged these partners when creating the Eco-Logical tool. The grant project began when H-GAC convened a large group of stakeholders, some of whom formed an Environmental Advisory Committee (EAC). The EAC helped define the region's ecotypes and weigh their defining metrics. The involvement of and support from this range of stakeholders in the EAC gave the project credibility with many organizations in the region.

H-GAC's final report documents the methodology for developing the Eco-Logical tool, which other local or regional agencies could replicate. H-GAC staff emphasize that DOTs or MPOs who replicate the project should focus on the connection between tool design and policy goals. Currently, the Conservation Fund is expanding the Eco-Logical tool to the additional five counties in the Houston-Galveston region.

H-GAC staff are working to educate policymakers (through webinars and tutorials) on the tool's purpose and benefits to facilitate its inclusion as a required component of the 2040 Regional Transportation Plan (RTP). H-GAC is also working to incorporate the tool into the concurrent Regional Sustainable Development Plan, which H-GAC is developing through a HUD Sustainable Communities Grant. H-GAC's current goal for its Eco-Logical tool is the tool's formal integration into the project prioritization process. With additional funding, H-GAC would re-engage existing partners and establish new partnerships at the city and county level to gain the support for the use of the Eco-Logical tool in project prioritization.

Chicago DOT
David Leopold

A project-specific application of the Eco-Logical approach, the Chicago DOT Eco-Logical grant project supports the outreach and education activities related to its construction of a sustainable streetscape pilot that uses Leadership in Energy and Environmental Design (LEED) principles. These activities include the creation of a sustainable design manual and the production of educational kiosks and brochures. When complete, Chicago DOT will use the Eco-Logical products to inform regional governments and the public about LEED principles in streetscape design and provide residents with information on how to integrate low-impact strategies into their travel patterns and household behaviors.

Chicago DOT has completed 77 percent of the streetscape construction for the pedestrian, bicycle, parking, and planter improvements and expects to finish construction in the spring of 2012. The project team continues to monitor construction data on a weekly basis to assess the project's progress against the regional metrics outlined in the sustainable design manual.

Partnerships are integral to the Chicago DOT sustainable streetscape. A neighborhood citizen group, the Pilsen Planning Committee, was active in the planning and execution of the project. Chicago DOT also engaged several partners internally within the city government at the project's outset. These relationships allowed Chicago DOT to engage in more effective communication with the other city departments during the permitting and construction phases. Chicago DOT staff worked with the Benito Juarez High School, which is along the streetscape project, to incorporate Eco-Logical principles into a school reconstruction project and promote environmental education programs.

With additional funding, Chicago DOT would seek assistance in forming decision support tools for balancing a project's environmental requirements. The streetscape pilot monitors an array of factors, including but not limited to stormwater management, pedestrian mobility, recycled construction waste, use of local materials, and urban heat island effect. Sometimes decreasing a specific impact can result in an increased impact elsewhere. Chicago DOT has not yet determined a priority ranking for these factors. Creating a decision support tool would guide planners through the breadth of environmental priorities.

DISCUSSIONS

Over the course of the peer exchange, FHWA staff and grant recipients highlighted common challenges and successes of utilizing the Eco-Logical approach. Discussions focused on the partnerships and the benefits and challenges of working with diverse stakeholders; organizational leadership and adoption of Eco-Logical, and the transportation outcomes resulting from the grant recipients' Eco-logical tools and projects. Below are the common themes from each discussion.

Partnerships and Working Groups

The grant recipients have all forged new relationships, strengthened existing partnerships, and/or opened new lines of communication with partner organizations. These partners ranged from Federal and State agencies to local governments, NGOs, and private citizens. Though the grant recipients partnered with different stakeholders in a variety of ways, several themes emerged regarding the challenges of and effective strategies for creating partnerships and working groups.

1. **When partner agencies adopt Eco-Logical grant products, those products and Eco-Logical principles become institutionalized in the region.** By serving as champions of their local Eco-Logical tool, partner organizations that actively use grant products are highly effective at encouraging other regions or organizations to adopt grant products and Eco-Logical principles. As organizations see their peers and partners adopting a new approach they may be more likely to adopt that same approach. As Texas planning organizations championed the TEAP, other EPA Region 6 agencies became eager to adopt the Eco-Logical approach.

2. **Working with existing contacts at partner organizations can help grant recipients to reach the appropriate staff members at those organizations to collaborate with on Eco-Logical.** By reaching out to contacts grant recipients had previously worked with, they could more easily find and establish rapport with the necessary subject matter experts within a given agency or organization. Grant recipients found this to be a more effective strategy than cold-calling individuals within an agency, and helped them determine what level (staff, management, executive, etc.) of representative would be most appropriate to engage in the project.

3. **Reengaging existing partners allows for an implicit level of trust.** Many of the grant recipients created working groups and stakeholder teams from partners with whom they already had relationships. This was particularly true for the MPOs, H-GAC, and TJPDC. Resource agencies and tribal governments are oftentimes protective of their data. Engaging partners with whom an organization or its staff members already have established, favorable relationships can ease some of the challenges of acquiring data.

4. **Establishing new partnerships became easier once an Eco-Logical grant product was complete.** For many of the grant recipients, having a finished tool or product helped them engage new partners. Instead of marketing a concept, the grant recipients had a concrete tool to demonstrate not only the benefits of Eco-Logical, but also the ease of integrating the Eco-Logical approach. EPA Region 6 used the TEAP as a pilot for the five-State REAP. Starting with the smaller scale and successful methodology allowed EPA Region 6 staff to reveal to management the potential benefits of a regional tool.

5. **Conflicting State and local priorities can make partnering with State DOTs a challenge.** Both TJPDC and H-GAC did not partner with their State DOTs, and expressed that incorporating the Eco-Logical approach was not a priority for State DOT staff. Grant recipients stated that State DOTs lacked an understanding of the Eco-Logical approach and their role in collaboration on Eco-Logical projects.

6. **Reiterating the link between Eco-Logical and the signatory agency Division, Region, and District Offices throughout the country assists in developing cooperation and partnership.** H-GAC brought copies of the original *Eco-Logical* document to meetings with signatory agency local offices and emphasized their agency's commitment to this approach. Tying the local or regional product back to the national agency objectives assisted in creating favorable relationships with the division offices.

7. **Increasing the responsibility of project partners expands these partners' understanding of the Eco-Logical project as well as improves their constituents' support.** Working groups and their members can play many roles, ranging from advisory to task- and action-based. Including partners in planning and public outreach in addition to decisionmaking can increase their understanding and commitment to the project. Colorado DOT included stakeholders on selection committees for consultants and contractors. After these experiences, stakeholders had more realistic expectations of how the project would be carried out and the time frame in which it could be completed. They were then responsible for speaking at local meetings about the project. Residents and constituents learned about projects in their region from trusted, familiar representatives.

Organizational Leadership and Adoption

The Eco-Logical approach represents a shift from the traditional transportation planning, project delivery, and mitigation processes, and adopting the Eco-Logical approach can involve a significant change in organizational practices. The grant recipients shared both obstacles to and successful tactics for adopting Eco-Logical in their organizations.

1. **Senior management buy-in of Eco-Logical is crucial at all organizations, but management's engagement in the Eco-Logical process may vary based on the size of the organization.** Supportive senior-level management can allocate staff and financial resources to the development and implementation of Eco-Logical projects. Small MPOs are heavily driven by the Executive Director. TJPDC has a small staff, and the Executive Director spearheads the Eco-Logical project. If he were to leave, the future of the project would be at the discretion of the incoming Executive Director. At larger organizations, it is important for senior management to approve and be aware of Eco-Logical project work, while they may not be involved in the day-to-day development and execution of the projects.

2. **To gain leadership support and endorsement for the Eco-Logical approach, grant recipients tailored their promotion of Eco-Logical to match the priorities of their organizations and regions.** Eco-Logical is an ecosystem approach to developing infrastructure, but has benefits beyond decreasing the environmental impact of a transportation project. Presenting the Eco-Logical approach as a cost and time saving technique can garner widespread support. While Colorado DOT successfully advocated the environmental value of Eco-Logical to its partners and management, other grant recipients focused their promotion of Eco-Logical on the economic and job creation benefits of the approach.

3. **Gaining support for Eco-Logical by local public leaders is important.** It is important for agencies and organizations implementing Eco-logical to seek support and buy in from local leaders to ensure they understand the value of this approach.

4. **The Eco-Logical approach promotes transparent, data-based decisionmaking.** It is easier to garner support for a decision with quantitative backing than one without a comprehensive rationale behind the decisionmaking. Using an Eco-Logical tool for transportation project prioritization can increase the transparency of the decisionmaking process. TJPDC emphasized that planning decisions must be increasingly validated by data, and that Eco-Logical tools provide readable, data-rich support.

Transportation Outcomes and Next Steps

Nearly all of the grant recipients are engaged in activities to implement their grant products. Grant products include maps, datasets, and spatial analysis tools, as well as regional priorities, outreach materials, and methodologies. Most grant recipients have adopted an REF to help guide transportation planning decisions and project prioritization in upcoming LRTPs.

1. **Organizations must regularly update REFs in order to remain relevant and useful.** Several grant recipients noted how aspects of their geospatial tools will or already have become outdated. Regularly updating Eco-Logical tools will keep them reliable and useful for adopting organizations. H-GAC's Eco-Logical tool allows users to submit corrections to specific shape files, allowing for regular updates. EPA Region 6 identified programming the REAP for automatic updates as a near-term priority, as it is inefficient and laborious to regularly update the protocol's datasets.

2. **Easy to use web-based tools and maps help grant recipients broadcast their projects to a wide audience.** REFs that are simple to navigate are more likely to be adopted by local organizations for their planning processes and by NEPA reviewers during their environmental review. Many organizations with GIS capacity have been eager to use the EPA Region 6 REAP, while those without GIS capacity have been more hesitant to adopt the tool. EPA Region 6 included the REAP in NEPAssist to increase accessibility for those without GIS experience. Simple, public methodologies and instructions can assist in a more widespread adoption of Eco-Logical tools.

3. **Developing REFs with alterable metric prioritization allows users to adapt these tools to best meet their project needs.** Organizations are sometimes hesitant to adopt tools they did not create, as the methodology may not match their mission and local priorities. Allowing users to adapt the tool to their needs broadens its applicability. H-GAC's Eco-Logical tool allows users to change the metric prioritization and weigh factors according to the needs of their projects while still providing a weighting suggestion. The parameters of the tool can be updated to meet the needs of different organizations or projects.

4. **In creating Eco-Logical tools, grant recipients should consider the range of potential adopters in their region.** The scale and resource types inventoried for an Eco-Logical tool should match the needs of the adopting organization. Organizations covering small planning regions will find tools based on fine, precise data to be more useful than those that designate larger areas as a single ecosystem unit or pixel. The current grant recipients' Eco-Logical tools mapped their regions on different scales. Each pixel in the EPA Region 6 REAP represented a square quarter-kilometer, while the pixels in TJPDC's tool corresponded to a square 30 meters. Organizations like TJPDC would have trouble employing a tool like the REAP to projects in their regions.

5. **Eco-Logical implementers must evaluate what wording and branding best suits the priorities of their region.** Not all grant recipients use the term "Eco-Logical" in promoting their products. Some grant recipients indicated that Eco-Logical sounded specialized rather than broadly applicable and promoted the geo-spatial or transportation aspects of their product rather than its ecosystem considerations. H-GAC titled its tool "Eco-Logical", while the other grant recipients chose different names to define their grant products.

RECCOMENDATIONS

Each of the grant recipients that attended the peer exchange presented promising findings and progress toward implementing the Eco-Logical approach. These strong examples of Eco-Logical in action lend credibility to Eco-Logical approach, and suggest that FHWA should continue to fund further applications of the Eco-Logical approach to both better understand Eco-Logical in practice and to help to mainstream Eco-Logical nationwide. The following recommendations are based upon the discussions with the grant recipients in attendance regarding their ideas for how to improve future Eco-Logical grant programs.

Format for Future Grant Program

The next iteration of the FHWA Eco-Logical grant program could take one of several forms ranging from a traditional grant program to the further funding of existing projects. Each of these forms presents certain opportunities and limitations.

Format	Description	Wide pool of applicants	Increased control over application of Eco-Logical	Increased assurance over project outcomes	Increased national reach
Traditional Grant	A call for applications that would allow both new and existing applicants to apply for an Eco-Logical grant with minimal restrictions.	X			X
Tight Grant	A call for applications that would allow both new and existing applicants to apply for an Eco-Logical grant with considerable restrictions such as requiring formal partnering agreements predating the grant.	X	X		
Direct Funding	Research funding transferred to an existing grant recipient to expand work done under a current Eco-Logical grant project.		X	X	
National Outreach	Guidance and technical assistance provided on an as requested basis to any agency across the country.	X			X

Criteria for Selecting Future Grant Projects

When selecting the next round of Eco-Logical grant recipients, FHWA should consider applying strict criteria to the selection process. The peer exchange generated a better understanding of the types of criteria that would ensure that the next round of grants achieves the degree of implementation that FHWA hopes to reach through further funding.

Restrict selection to grants that focus on specific types of activities. By selecting grant projects that focus on the specific aspects of the Eco-Logical approach or transportation delivery process, FHWA can ensure that the selected grant recipients will provide advances in applying Eco-Logical and test specific portions of the approach.

Require grant recipients to develop formal agreements with partner organizations and agencies. All of the grant recipients that attended the peer exchange cited the importance of establishing formal and informal partnerships. Colorado DOT was one of the most impressive examples with its robust MOUs. FHWA should strongly consider making formal documentation of partner agreements a requirement of the next round of grants.

Require grant recipients to document their methodology so that each program can be replicated in other areas. Each of the initial Eco-Logical grants was required to provide progress and final reports for their grants. These materials have proven to be extremely valuable in better understanding their application of Eco-Logical. With precise documentation, these final reports could be used by other regions looking to implement a specific application of Eco-Logical.

Require grant recipients to meet performance measures. Putting standard performance measures that apply to all of the grant recipients into place will help FHWA to control to some extent, the path of the grants and the outcomes. By carefully selecting the performance measures, FHWA may be able to better answer key questions about how to best put the Eco-Logical approach into practice.

Elements of the Eco-Logical Approach That Should be Incorporated into Future Grants

Any future Eco-Logical grant funds distributed by FHWA should require grant recipients to tie their work back to specific aspects of the Eco-Logical approach. Continuing to establish the relationship between Eco-Logical and the work done by grant recipients will help FHWA to better document the successes and challenges associated with particular segments of Eco-Logical, and provide better guidance to other agencies seeking to carry out Eco-Logical throughout the country.

Later Stages of Integrated Planning. The grant recipients that attended the peer exchange successfully completed or designed tools that would help other regions complete Integrated Planning Steps 1-5 (Build and Strengthen Collaborative Partnerships, Identify Management Plans, Integrate Plans, Assess Effects, Establish and Prioritize Opportunities). Most grant recipients began Step 6: Document Agreements. Future grants should be targeted to recipients who have completed Steps 1-5 and are ready to undertake Steps 6-8:
- Step 6: Document Agreements
- Step 7: Design Projects Consistent with the Regional Ecosystem Framework
- Step 8: Balance Predictability and Adaptive Management.

By seeing a project through these latter steps of the integrated planning process, FHWA will be able to document the Eco-Logical project from inception through management and be able to more accurately measure the value of individual components of Integrated Planning within Eco-Logical.

Incorporating an Ecosystem Approach into Mitigation Decisions. Each grant recipient at the peer exchange had either identified or developed systems to identify mitigation opportunities; however few had actually taken steps to translate these opportunities to actual decisions. Future grants should aim to take the information developed through an REF and apply that information to ecosystem scale mitigation, conservation and avoidance decisions. Through application of this portion of Eco-Logical, grant recipients will be able to realize the value of integrating existing data at an ecosystem scale to yield better environmental outcomes and improved mitigation.

Adaptive Management through Performance Measures. Successful current grant recipients each developed a clear project plan and documented their progress. In order to fully apply Eco-Logical, future grants should develop management plans and internal performance measures that will help each implementing organization to maintain and adapt long-term ecosystem scale planning and development.

Activities to be Funded through Future Grant Program

Grant recipients that had developed an REF or a tool to develop an REF and had either fully or preliminarily formalized agreements with partners displayed the greatest forward momentum in implementing Eco-Logical, therefore, FHWA should consider funding activities that are action and outcome oriented. The themes that emerged through the peer exchange suggest that the following types of activities may advance the implementation of Eco-Logical nationwide:

Project Prioritization. Each successful Eco-Logical grant recipient developed some form of an REF to improve transportation decisionmaking. The recipients at the regional and State levels plan to use their REFs to prioritize projects through long range transportation planning. The activity of project prioritization could be funded by FHWA under an Eco-Logical grant. This would allow grant recipients to improve environmental decisionmaking, and advance Eco-Logical in their regions to the stage at which on the ground mitigation and transportation projects may come to fruition.

Formalizing Partner Agreements. Most of the grant recipients that attended the peer exchange had agreements with partners, and most had assembled interagency working groups. However; aside from their project report, few grant recipients had documented the agreements through formal channels. One activity that FHWA could fund would be to formally develop agreements through MOUs or Memorandums of Agreement and to document the agreement and to formalize the intent of the agreement.

Identify and Implement Mitigation Opportunities. Although the Joint EPA/U.S. Army Corps of Engineers Final Compensatory Mitigation Rule now favors mitigation banking which is in line with Eco-Logical, FHWA could still seek to fund grant projects that will use an REF to make key mitigation decisions then develop mitigation or conservation bank or an in-lieu fee program. These mitigation decisions should be ecosystem-scale and should incorporate principles associated with advanced mitigation.

Outreach to and Support from Local Leaders. One key challenge encountered by multiple participants of the peer exchange was the roadblock created by local political leaders. FHWA should consider requesting that grant recipients perform outreach to local decisionmakers to ensure that the work done by the Eco-Logical grant project is not disregarded by local leaders.

Reproduce Existing Methodology. Each of the grant recipients developed strong examples of the initial phases of the Eco-Logical approach. FHWA could fund existing grant recipients to expand and adapt their methodology to other regions. This would serve to expand the Eco-Logical approach to a broader audience, especially in regions of the country that are less likely to attempt ecosystem scale infrastructure development.