ENVIRONMENTAL MITIGATION IN TRANSPORTATION PLANNING

Case Studies in Meeting SAFETEA-LU Section 6001 Requirements

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EXECUTIVE SUMMARY

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) included provisions intended to enhance the consideration of environmental issues and impacts within the transportation planning process. Through the provisions, which encourage the continued evolution of the metropolitan and statewide transportation planning processes that metropolitan planning organizations (MPOs), State Departments of Transportation (DOTs), and public transit operators conduct, many of the types of activities previously considered effective practice became required for the first time.

This report presents and synthesizes the findings from nine case studies that examine a spectrum of environmental mitigation strategies, policies, and activities transportation agencies have undertaken to meet the new requirements. It is expected that the observations and insights described can be used to assist transportation professionals nationwide in improving their agencies' planning processes and outcomes. The project team case studied the Baltimore Regional Transportation Board; the Capital District Transportation Committee; Illinois DOT; the Maricopa Association of Governments; the Mid-Ohio Regional Planning Commission; Minnesota DOT; Montana Department of Transportation; the Piedmont Triad MPOs; and the San Diego Association of Governments.

KEY FINDINGS

SAFETEA-LU Section 6001required that MPOs and DOTs include a discussion of potential environmental mitigation activities and potential areas to carry out those activities in their long range plans. It also required that the environmental mitigation discussion be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies.

Section 6001's non-prescriptive nature regarding how these requirements should be met has led to a variety of innovative practices. Some transportation agencies have planned mitigation strategies more broadly than they may have in the presence of more specific details and stipulations. Section 6001 has also strengthened the ability of transportation agencies to interact with resource agencies and has legitimized and reinforced existing consultation efforts. One MPO staff person commented that Section 6001 has ensured that "the wheel is not reinvented every time there is an actual project."

Although interagency coordination had previously occurred to some extent during project planning, Section 6001 has strengthened efforts to consult with resource agencies earlier in a project's planning stages. Contacts pointed out that Section 6001's consultation requirement has allowed transportation agencies to be "in the room and at the table" with resource agencies for discussions that previously would not have occurred. This indicates that through environmental mitigation planning, State DOTs and MPOs have an opportunity to serve in lead environmental coordinating roles for their respective regions. With the new attention given to environmental factors, partnerships and cooperation are necessary at an earlier and broader scale than ever before. Since planned transportation projects might be in proximity to or cross a number of natural resources across wide areas, MPOs and State DOTs are now positioned to coordinate various agencies' environmental mitigation-related contributions. Given emerging priorities that focus on livability and sustainability, some

contacts noted that new actors could, and should, be brought in as part of broader discussions on mitigation, transportation, and land use.

It is unclear whether considering environmental mitigation in planning has led to streamlined project development. Anecdotal reports suggest, however, that the improved, and in some cases, new relationships with resource agencies have helped to inform project-level decisions further along in the transportation delivery process and would, at a minimum, make MPO and State DOT planning staffs' jobs easier in the future (i.e., they would know more quickly whom to contact).

It was also intimated that measures of environmental streamlining could be broadened. One State DOT noted that measuring the length of time from project inception to completion—the traditional environmental streamlining performance metric for project delivery—is of limited value for evaluating progress. The measure might not capture the full extent or result of benefits that occurred during a project's full lifecycle (including project planning).

Finally, most contacts did not include consideration of how potential environmental mitigation strategies would be monitored, if implemented. Several study participants, however, indicated that it would be helpful to monitor in the future; otherwise the mitigation discussions might become too generic to be meaningful. A challenge in doing this would likely be determining the extent to which planners understand, monitor, or interpret results from the mitigation projects implemented.

Other major challenges have been:

- **Achieving consensus on definitions, scale, and level of detail**. There has been some difficulty in agreeing on definitions used during the mitigation process, such as determining what constitutes "proposed" and "potential" mitigation, though these terms come from statute. It was not always easy to reach consensus with stakeholders on the best scale for approaching mitigation. Some staff believed an assumption that mitigation would occur regardless of the transportation project was inherent with the requirement to plan for mitigation. There was a concern that this could lead planning agencies to focus only on mitigation, rather than on avoidance and minimization strategies that preclude the need for mitigation.

- **Insufficient staff time to consider environmental mitigation strategies**. Some MPOs reported that due to their small staff size, it was challenging to find time to factor in another component to the planning process—especially when engaged in other transportation planning work. MPOs also experience this with resource agency staff. In many cases, resource agency staff might not view the transportation planning process as the best place to devote their already limited time.

- **Comprehending mapped resources**. In some cases transportation agency staff did not understand the relative significance of the resources they were mapping. Instead, the importance of resources would not be revealed until a transportation project was being implemented and the resource agency(s) provided additional input. MPOs reported that future mitigation planning efforts might involve earlier outreach to resource agencies to develop a clearer understanding of what the environmental data actually mean for planned transportation projects.

- **Preparing cost estimates**. Some MPO staff indicated that the biggest change in daily job duties as a result of Section 6001 was that mitigation, and wetland

Recommendations for addressing these and other challenges (discussed in Chapter 2) include:

- Research and disseminate effective mitigation practices;
- Support MPOs and State DOT planning staffs in identifying regional avoidance and minimization opportunities;
- Research connections between regional environmental mitigation and programs that aim to link planning and NEPA;
- Support MPOs' collaboration with State DOTs;
- Enhance MPOs' roles for regional coordination;
- Expand partnerships with those not traditionally included in making planning-level environmental considerations;
- Support MPOs and State DOTs in developing—at planning stages—performance measures for mitigation;
- Support MPO, State DOT, and resource agency collaboration to identify the relative importance of environmental resources.

I. INTRODUCTION

PURPOSE

The purpose of this case study report is to examine the ways in which metropolitan planning organizations (MPOs) and State Departments of Transportation (DOTs) have responded to Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) new environmental and consultation requirements in transportation planning. By presenting key success factors and lessons learned, common challenges and gaps, and other observations, this report is expected to assist transportation officials across the nation in improving their transportation planning processes and outcomes.

BACKGROUND

In December of 1995, nine Federal agencies signed a Memorandum of Understanding (MOU)[1] encouraging an "ecosystem approach," or a method for sustaining or restoring ecological systems and their functions and values. The MOU articulated a policy that the "Federal Government should provide leadership in and cooperate with activities that foster the ecosystem approach to natural resource management, protection, and assistance." It also mobilized an interagency steering team to collaborate over a three-year period to write *Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects (Eco-Logical)*, a document that presents a method for conducting integrated, regional planning in a way that sustains and restores sensitive ecosystems while promoting cost-effective infrastructure investments. SAFETEA-LU effectively codified the approach that *Eco-Logical* endorsed. Specifically, SAFETEA-LU Section 6001: Environmental Considerations in Planning requires metropolitan and statewide long range transportation plans (LRTP) to "*Include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan* [Sec. 6001(i)(2)(B)(i)]." This was further identified in the Statewide and Metropolitan Planning Regulations as 23 CFR 450.214(j) for Statewide Planning and 23 CFR 450.322(f)(7) for Metropolitan Planning.

Section 6001also requires that the environmental mitigation discussion be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies. All metropolitan and statewide transportation plans, transportation improvement programs (TIPs), and statewide transportation improvement programs (STIPs) were required to be consistent with these planning provisions, effective July 1, 2007.

Results from an Association of Metropolitan Planning Organizations (AMPO) field survey conducted in April 2006 showed that approximately one-third of 67 surveyed MPOs anticipated difficulty in meeting environmental mitigation and consultation requirements of the legislation, while about half of respondents were unsure—perhaps unsurprising findings given the short time period that had elapsed between SAFETEA-LU's issuance and the survey. Although it did not specify why MPOs anticipated difficulty meeting the requirements, survey evidence suggests that it might have been related to the need for additional, specific guidance on

[1] The MOU is available ate www.environment.fhwa.dot.gov/ecological/eco_app_a.asp.

effective mitigation approaches, or concerns about lack of staff resources and time to dedicate to taking mitigation into account in planning.

More recently (April 2008), the U.S. Government Accountability Office (GAO) assessed the progress of selected transportation agencies in addressing Section 6001 requirements.[2] State DOTs and MPOs reported to GAO that identifying mitigation needs during project planning was valuable, but efforts had been hindered by difficulties in convening resource agencies during project planning stages (as planning may not have historically been part of resource agencies' missions). GAO also found that transportation agencies generally agreed that obtaining relevant and accurate data was a key step toward addressing environmental requirements but that data gaps are a concern.

Due to the timing differences between SAFETEA-LU being issued and transportation plan update cycles, at the time of developing the case studies, most agencies had only made one long-range transportation plan (LRTP) or statewide transportation plan update since SAFETEA-LU. For this reason, it is difficult to determine whether the approaches described are "best practices." Rather, the approaches highlighted in the case studies demonstrate the variety of strategies, policies, and programs that agencies have used to make these considerations while providing insight on key success factors and challenges, real and perceived.

RESEARCH APPROACH

With over 700 MPOs and regional councils of government and 50 State DOTs (as well as DOTs in Puerto Rico and the District of Columbia) to consider, it was not practical to scan the entire population of potential agencies for practices to study. Instead, to avoid repeating efforts and to complement the work being performed elsewhere, the project team consulted a list of case study candidates that RSG Transportation Inc. has assembled for the National Cooperative Highway Research Program (NCHRP) study 25-25A(55).[3] Candidate agencies, which were listed in that document as having had implemented notable environmental mitigation planning activities, were screened against several variables, including:

- **Agency type**. Both MPOs and State DOTs would be researched.
- **Size and location** (for MPOs). Both large and small MPOs in terms of population and area served would be examined.
- **Date of plan or planning study**. More recent plan updates would be given preference.
- **Extent to which mitigation results were identifiable**. Priority would be given to potential cases where planning mitigation strategies had actually been implemented.
- **Extent to which specific, potential mitigation locations were identified**. Priority would be given to potential cases where important environmental resources had been mapped.
- **Extent to which innovative interagency collaboration practices were used**.
- **Predominant land use** (for MPOs). A diversity of land use patterns would be captured.

Transportation agencies whose plans met the most of these conditions were contacted for the study. The project team applied additional criteria, such as the use of innovative human resource practices (e.g.,

[2] GAO's "Highways and Environment: Transportation Agencies Are Acting to Involve Others in Planning and Environmental Decisions" is available at www.gao.gov/new.items/d08512r.pdf.

[3] The purpose of NCHRP 25-25A(55) is to develop an awareness program based on best practices that illustrates and motivates the mainstreaming of environmental stewardship into systems planning and project development.

funded positions[4]) and the extent to which mitigation financing is discussed in the plan, in cases where several candidates met similar conditions. The project team then conducted an internet search of LRTPs and STPs and literature review to fill in gaps in the sample selected. Finally, where possible, the project team made an effort to research and highlight practices from agencies that might not have previously experienced wide, case-study exposure. In all instances, the project team gave special attention to cases showing evidence of activity that is leading or has led to a streamlined project development process and better environmental outcomes.

To conduct the case studies, 13 telephone discussions ranging from 30 to 60 minutes were held between May and July 2009. A flexible discussion guide that allowed participants to talk about other topics not specifically included (see Appendix B) provided for semi-structured discussions; given the diversity of efforts investigated, the project team tailored questions to the agency participating in the discussion. The team then drafted case studies based on the discussions, relevant supplemental materials provided, and comments and suggestions the contacts provided.

REPORT STRUCTURE

Chapter 2: Observations presents observations made during discussions. The chapter synthesizes key ideas and trends that MPO and State DOT staff described.

Chapter 3: Conclusions provides an overall summary of findings, insights for FHWA, and opportunities for future research.

The report concludes with *Chapter 4: Case Studies*, which documents all of the discussions held wit MPOs and State DOTs

[4] In January 2009, FHWA hosted an Environmental Consultation Peer Exchange where, among other topics, funded positions were discussed in depth. The report from the exchange is available at www.environment.fhwa.dot.gov/integ/ipwg_peer.html.

II. FINDINGS

Key insights, ideas, and trends illustrate why particular environmental mitigation and consultation activities began, and how they were implemented and have affected business practice. Common themes and lessons learned are presented.

INITIAL STEPS

Transportation agencies' approaches to considering environmental factors in transportation planning have evolved over time in response to legislation, changing technologies, and increased attention to and formalization of integrated planning as a common business practice. Prior to SAFETEA-LU, transportation agencies made resource or ecological considerations in a variety of ways and at different stages in transportation projects' lifecycles. However, as the U.S. Government Accountability Office has noted, in the absence of specific Federal regulations for how and when to consider environmental factors, many agencies chose to make these considerations during long-range planning and, to a lesser extent, just prior to the National Environmental Policy Act review process.[5]

Most agencies involved with these case studies confirmed this assertion. Environmental mitigation considerations and interagency consultation practices had occurred or been developed prior to SAFETEA-LU. Section 6001 legitimized and endorsed existing business processes. It confirmed that early consideration of mitigation, and coordination with other agencies, were effective strategies. To a large extent, desires to meet Section 6001's requirements spurred agencies to document and, ultimately, institutionalize these processes. As reported during the phone discussions, Section 6001 strengthened the ability of transportation agencies to consult with resource agencies, legitimize and reinforce existing consultation efforts, and provide opportunities and incentives to formalize existing mitigation approaches. One contact commented that Section 6001 has ensured that "the wheel is not reinvented every time there is an actual project."

To begin the process, the MPOs typically requested initial assistance from the State DOT. Some MPOs reported that the State DOT could provide the MPO with broader access to data resources and resource agency contacts. In some cases, such as with the Baltimore Regional Transportation Board, the State DOT prepared the environmental mitigation discussion on behalf of the MPO. In the Piedmont Triad area of North Carolina, MPOs met after SAFETEA-LU and the planning regulations were issued to discuss upcoming LRTP updates and particular sections for which coordination might offer benefits. The Piedmont Triad MPOs decided that a regional transportation authority would assist them in preparing consistent environmental mitigation language for the plan, as well as in conducting resource agency consultation.

The Illinois Department of Transportation (IDOT) initially searched other State DOTs' websites for examples of approaches to making environmental considerations in planning, finding that one State DOT had developed "special reports" on factors that could threaten successful implementation of the LRTP. With these examples, IDOT decided

[5] See GAO. 2004. Transportation Planning: State and Metropolitan Planning Agencies Report Using Varied Methods to Consider Ecosystem Conservation.

to develop its own special report, focusing on mitigation. Other agencies, such as the Montana Department of Transportation (MDT), found FHWA's *Eco-Logical: An Ecosystem Approach to Developing Infrastructure* (2006)[6] to be a helpful resource for determining what a regional mitigation strategy in planning might "look like."

FHWA has also provided guidance through a series of interagency workshops. For example, in 2006, FHWA, in conjunction with Defenders of Wildlife and NatureServe, conducted three Linking Conservation and Planning workshops designed to facilitate collaboration between transportation and conservation communities. One of the objectives of the workshops was to provide guidance and references for how transportation agencies could respond to SAFETEA-LU Section 6001. These early workshops were held in Arkansas, Colorado, and Arizona and included 157 participants.

ENVIRONMENTAL MITIGATION DISCUSSION

The ways in which the case study agencies included environmental mitigation discussions in their transportation plans and studies varied. Some agencies dedicated specific chapters in their plans to environmental mitigation, while others incorporated the discussion as appendices and addenda, or policy papers and special reports. Others chose to use common language or templates across several transportation agencies in a region.

The Maricopa Association of Governments in Phoenix, Arizona uses "framework studies" as resources for developing mitigation approaches once corridor projects are implemented. The framework studies are assessments of transportation needs and environmental, land use, and community development issues, focusing on regions with likely growth potential and transportation needs that are not fully covered in the LRTP. In another example, little additional environmental mitigation planning was necessary in response to Section 6001: in the 1980s prior to ISTEA, Minnesota DOT (Mn/DOT) provided funding to a state resources agency to buy and maintain wetland banks so that when transportation projects are constructed, banked credits exist to offset resulting wetlands impacts. The banked wetland areas were of sufficient size to compensate for projects' impacts for the next 10-15 years and allowed Mn/DOT to focus mitigation on priority resource areas rather than only on areas at the project site.

There are instances, however, where mitigation efforts might not be fully captured in LRTPs. The San Diego Association of Governments' (SANDAG) RTP only briefly discusses SANDAG's mitigation efforts. To address the gap, SANDAG has developed companion documents to the LRTP that describe mitigation opportunities in the region. This has demonstrated that there may be other ways to address regional mitigation approaches that complement the planning activities done in response to Section 6001.

CONSULTATION

As the incorporation of environmental considerations becomes more common practice in transportation planning, information-sharing across disciplines and organizational boundaries will likely continue to become more and more important.[7] Both State DOTs and MPOs expected interagency collaboration per Section 6001's consultation requirement would become, over time, an increasingly integral part of typical business practice. However, the ways that the case study agencies bridged agency lines to conduct consultation varied.

[6] www.environment.fhwa.dot.gov/ecological/eco_index.asp

[7] NCHRP 25-25(32). ww.trb.org/NotesDocs/25-25(32)_FR.pdf

For some State DOTs, little change might be necessary. Those involved in the case studies had previously developed contacts and channels for conducting interagency coordination—usually as part of the NEPA process or on-going data collection and sharing activities. State DOTs' previously established relationships ultimately aided MPOs in addressing Section 6001 requirements. State DOTs often had access to data and resource agency contacts that MPOs did not have. By virtue of their knowledge of upcoming transportation projects, State DOT staff could help guide MPOs to better plan mitigation. In North Carolina, the FHWA division office convened a meeting of all the state's MPOs to discuss a statewide approach to outreach with resource agencies. During the meeting, FHWA provided the Piedmont Triad MPOs with an initial list of resource agency contacts, which the MPOs later expanded as needed. As a second step in coordinating consultation efforts, the State DOT arranged several meetings with the MPOs and resource agencies, including a two-day workshop to discuss Section 6001 requirements and their effects on regional and statewide transportation planning activities. At the meetings, the resource agencies agreed to provide input on the MPOs' environmental mitigation discussions.

Some agencies, such as IDOT, commented that in the future there may be an opportunity to partner with non-traditional stakeholders, such as the freight community, in planning for environmental mitigation. Given emerging priorities that focus on livability and sustainability, IDOT believed that new actors could, and should, be brought in as part of broader discussions on mitigation, transportation, and land use. In anticipation of future land use and transportation goals, IDOT believed dedicated outreach to freight stakeholders would be useful.

GEOSPATIAL DATA AND MAPPING TOOLS

Corresponding to previous assertions on the importance of using geospatial data to make environmental resource considerations,[8] geospatial data and mapping activities were critical to most of the case study agencies researched regardless of the approach to documentation used. Sharing data with, providing maps to, or developing environmental maps for inclusion in the LRTP in concert with resource agency staff were integral to the case study agencies' environmental mitigation planning efforts.

For example, GIS analyses on various environmental resources along Minnesota's corridors underlie most of Mn/DOT's environmental mitigation decisions. The Archaeological Predictive Model helps Mn/DOT avoid impacts on archaeological sites throughout the state. In the future, Mn/DOT plans to use geospatial technologies to develop all figures in environmental documents. The MDT used Quantm, a GIS-based route optimization tool that considers thousands of alignment options. to determine the most cost-effective route that also avoids and minimizes environmental and other impacts. Using the tool, MDT can optimize corridor routes at a planning level to minimize costs and avoid sensitive areas. In the Maricopa Association of Governments example, 14 one-on-one sessions with resource and environmental agencies were scheduled to solicit their input on available maps and data that could be used to develop the LRTP.

In New York, prior to the SAFETEA-LU Section 6001 requirements, the Capital District Transportation Committee (CDTC), the Albany-area MPO, did not possess its own GIS resources, maps, or files. In order to

[8] One example is NCHRP's 25-22 report (2000), which profiles 21 different technologies to improve consideration of environmental concerns in transportation decision-making. http://onlinepubs.trb.org/Onlinepubs/nchrp/cd-14/

begin analyzing how the region's natural and cultural resources related geospatially to proposed transportation projects, CDTC acquired GIS maps and files from a non-profit organization responsible for protecting scenic, natural, and historic landscapes. The MPO approached the institute after coming across a study on sprawl that the institute had authored. With these data in hand, CDTC plans to overlay proposed TIP projects against maps of natural and cultural resources to identify possible intersections and environmental impacts.

Contacts sometimes reported that identifying and obtaining appropriate data were challenges. For example, staff in the Piedmont Triad MPOs commented that although resource agencies provided environmental data in response to the MPOs' requests, it was difficult to interpret the data and understand which resources were most important or which resources should be considered as priorities when planning for future transportation projects. Other studies have noted this obstacle as a major concern for agencies as they work to meet Section 6001 requirements. Additionally, some agencies reported a past concern among state agencies about sharing too much information with counterpart agencies. According to IDOT, there was sometimes an "us vs. them" attitude. Agencies would meet the requirements they faced but would not always provide information above and beyond the minimum.

ANTICIPATED OUTCOMES

Most of the case study agencies are still in the early stages of assessing outcomes from addressing Section 6001 requirements and could not definitely report whether Section 6001 had led to streamlining transportation project delivery. Their anecdotal reports suggest that the improved, and in some cases, new relationships with resource agencies had helped to inform project-level decisions downstream in transportation delivery and would, at a minimum, make their jobs easier in the future.

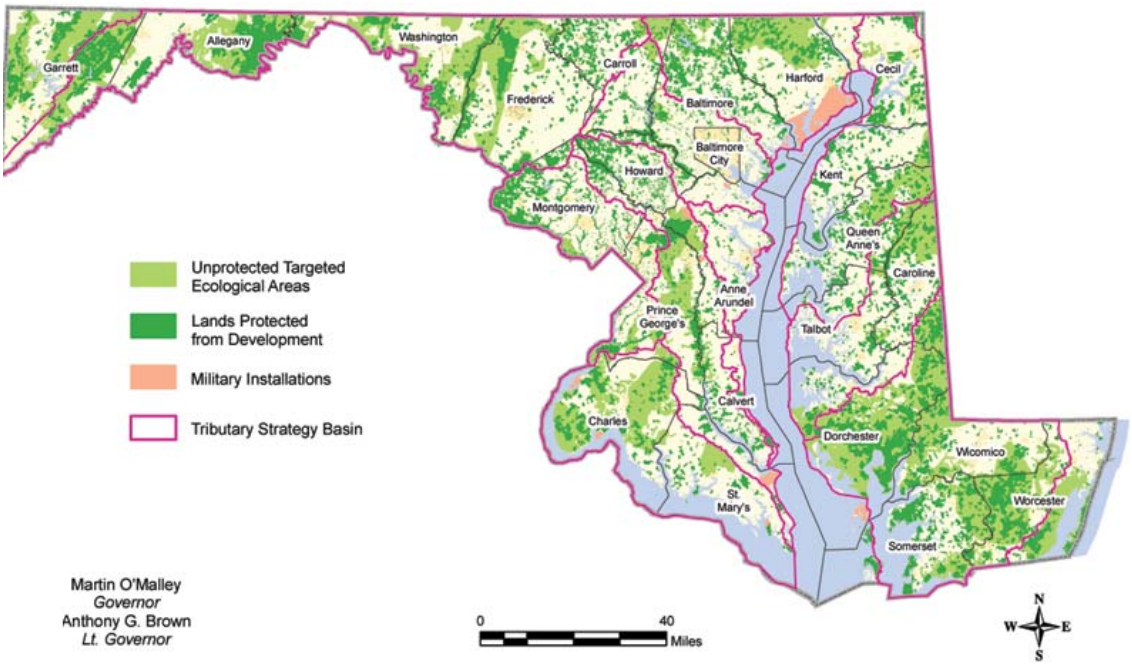
For example, it was pointed out that the consultation requirement of Section 6001 has allowed transportation agencies to be "in the room and at the table" with resource agencies for discussions that previously would not have occurred. State DOTs and MPOs also believed that having consulted with resource agencies on environmental topics in response to Section 6001 will likely result in time savings the next time LRTPs are updated; contacts have now been made and transportation officials will know with whom they should meet. At the Baltimore Regional Transportation Board (BRTB), interagency coordination had always occurred to some extent during project planning. However, BRTB affirmed that Section 6001 had strengthened efforts to consult with resource agencies earlier and that its jurisdictions were more aware of environmental factors—two aspects that likely help identify priorities and "red flags" to avoid delays in permitting or other problems later in project development. Another agency remarked that due to early stakeholder involvement, realistic project cost estimates could be developed more easily.

It was also intimated that measures of environmental streamlining could be broadened. One State DOT noted that measuring the length of time from project inception to completion—the traditional performance metric for project delivery and assessing environmental streamlining—could be a limited measure to evaluate progress. The measure may not capture the full extent or result of benefits that occurred during a project's lifecycle. It was also suggested that certain situations can provide an impetus for expediting project development—construction of the new I-35 bridge in Minnesota is one example. Measurements for environmental streamlining should account for exceptional circumstances while being more inclusive of all project elements.

Most discussions of environmental mitigation in the case study agencies' LRTPs did not include mention of mitigation monitoring. To date, there has been little consideration of mitigation performance monitoring in planning. Several study participants, however, indicated that it would be helpful to do so in the future. A challenge would likely be determining the extent to which planners should understand, monitor, or manage the mitigation projects actually implemented. In the Illinois DOT (IDOT) case study, funding constraints and a backlog of repairs on roads and bridges have contributed to a tendency to look at the transportation system's condition from a programming perspective. The focus of performance has often been viewed in terms of getting and keeping the system up and running rather than thinking about what constitutes performance afterwards. By developing and publishing performance measures for mitigation at a planning stage, IDOT expects the public would have a better understanding of the breadth of work for which IDOT is responsible.

Finally, in the future, it is expected that environmental justice considerations will play a more prominent role in planning for environmental mitigation. It is not uncommon to have multiple, different environmental justice maps that are kept separate from other environmental resource maps. Overlaying environmental justice and environmental mitigation maps can help identify issues, such as inequitable distribution of transportation services or access to clean air and water, not always previously addressed in planning environmental mitigation.

GreenPrint map displaying unprotected and protected ecological areas in Maryland.
For more information, see the Baltimore Regional Transportation Board case study on page 13.



III. RECOMMENDATIONS FOR FHWA

Observations from discussions indicate that incorporation of environmental mitigation in transportation planning is an evolving process. There were recurring challenges, including concerns that resource agencies do not have sufficient resources (such as staff, funding, and time) to participate in planning-level mitigation discussions, that it is difficult to conceptualize regional-level mitigation, and that geospatial data on environmental features are not always easily accessible or complete. Overall, MPOs and State DOTs are adjusting their mitigation strategies based on lessons learned during plan updates as well as guidance received from FHWA and other stakeholders.

Additionally, some case study participants suggested future areas of FHWA analysis or ways FHWA might continue to support State DOTs and MPOs in considering environmental mitigation in transportation planning. Where there was overlap among suggested measures, the study team combined recommendations:

Research and disseminate effective mitigation practices

FHWA should continue to research, compile, and disseminate examples of effective practice on mitigation approaches, policy-level mitigation, and strategies for assessing mitigation outcomes, including performance measures. Several contacts noted that it would be useful to have a guide or compilation of best practices for developing a regional- or policy-level mitigation approach. This type of guide might be particularly useful for MPOs that had not previously considered environmental mitigation prior to SAFETEA-LU, or for regions that had historically implemented mitigation only on a project-by-project basis. Information on the tools developed and approaches adopted in the cases highlighted here could serve as a foundation for assembling and publicizing additional examples of effective practice.

Support MPOs in identifying regional avoidance and minimization opportunities

Some MPO staff believed that inherent within a policy-level mitigation approach was the assumption that mitigation would occur no matter what type of project was implemented. Some discussion participants expressed concern that this assumption could lead a planning agency to focus only on mitigation, rather than on avoidance and minimization strategies that preclude the need for mitigation. To support MPOs in identifying regional avoidance and minimization opportunities, FHWA could compile and disseminate best practices and lessons learned on avoidance and minimization efforts nationwide.

Research connections between regional environmental mitigation and programs that aim to link planning and NEPA

The Mid-Ohio Regional Planning Commission (MORPC) in Columbus, Ohio believed that funding liaison positions, where the State DOT provides funding for a resource agency staff member to focus primarily, if not solely, on transportation projects, had helped build resource agencies' capacity for addressing mitigation at the project level. FHWA has investigated lessons learned from funded

positions programs at eight State DOTs, and findings have agreed. According to the forthcoming research, funded liaisons have helped improve the communication of resource agency perspectives to transportation agencies early on during mitigation planning.

In addition to continuing this work, FHWA can continue research on other efforts that focus on linking planning and NEPA and streamlining project development. Results from completed and ongoing research efforts can be compiled and further linked to MPOs' efforts to develop mitigation approaches at the conceptual level.

Support MPOs' collaboration with State DOTs

FHWA should continue to facilitate MPOs' collaboration with State DOTs when fulfilling Section 6001 requirements. Discussions revealed that there are often gaps between MPOs' plans and State DOTs' actions: the MPO sometimes had little knowledge of what State DOT projects were on the horizon, while the State DOT might not necessarily have knowledge of how the MPO was addressing planning-level mitigation. To address these gaps and ensure that MPOs' regional-level mitigation is reflective of upcoming work, the State DOT could provide input on upcoming transportation projects. Because the State DOT is the entity that implements or monitors mitigation projects, gathering the State DOT's input on mitigation at the planning stage could also facilitate later project implementation and monitoring. Finally, the State DOT might have access to and could share key resources, such as contacts at resource agencies or geospatial data, which are unavailable to an MPO or difficult for the MPO to access.

Expand partnerships

There may be an opportunity for FHWA to partner with stakeholders not traditionally included in making planning-level environmental considerations, such as the freight community. Given new priorities that focus on sustainability, it could be important for new actors to be brought in as part of a broader discussion on mitigation, transportation, and land use. For example, in anticipation of future land use and transportation goals, dedicated outreach to freight stakeholders could be particularly useful. Their input could lend a perspective on potential environmental mitigation decisions perhaps not previously considered.

Enhance MPOs' roles for regional coordination

Through including environmental mitigation in transportation plans, MPOs have opportunities to emerge as leading environmental coordinators in their respective regions. A regional-level approach to mitigation necessitates partnerships and cooperation to an extent that is broader than before. FHWA might be able to help MPOs' better understand how to coordinate various agencies' environmental mitigation-related contributions

Support MPOs and State DOTs in developing mitigation performance measures in planning

As State DOTs begin to implement mitigation projects identified during transportation planning, it may also become important to identify performance measures for these projects during the planning stage. Encouraging transportation planners to identify mitigation performance measures could help their respective agencies improve future project design and better link project implementation back to planning. To support development of meaningful performance measures in planning, FHWA could research and inventory examples of where mitigation performance measures have been incorporated into the planning process, compile and disseminate examples of useful measures, or produce guidelines for doing so.

FHWA could also help devise an approach or metrics for determining whether Section 6001 requirements have led to streamlined permitting.

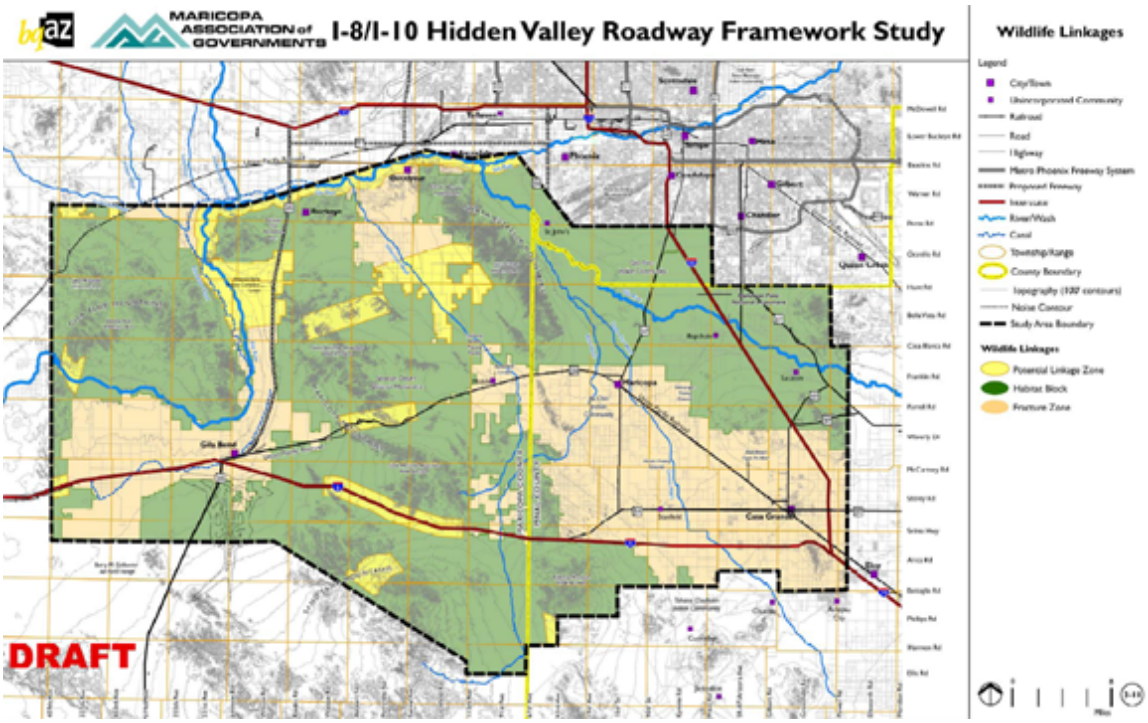
Support MPO and resource agency collaboration to identify the relative importance of environmental resources

Some MPO staff stated that it was difficult to identify the relative importance of environmental resources once they obtained environmental data from resource agencies, which could compromise the specificity of environmental mitigation considerations made. It was noted that the act of simply mapping environmental resources did not necessarily indicate a comprehensive knowledge of how transportation projects might impact priority resources. FHWA might consider opportunities to support resource agencies sharing information with MPOs on the relative importance of resources and then analyzing these data. This collaboration would help build MPO staffs' environmental competencies and abilities to more specifically target mitigation strategies to prioritized resources.

Address fiscal planning for mitigation

Some MPO staff indicated that the biggest change in daily job duties as a result of Section 6001 was that mitigation, and wetland mitigation in particular, is now included in preparing project cost estimates. Previously, MPOs' financial plans for the LRTP did not account for potential costs of planned mitigation. Agencies should consider that accounting for mitigation might add time and cost to developing estimates for the LRTP financial plan, as well as to the cost estimates for the projects themselves.

Wildlife linkages map from I-8/I-10 Hidden Valley Roadway Framework Study in Arizona.
For more information, see the Maricopa Association of Governments' case study on page 27.



IV. CASE STUDIES

The project team developed case studies for nine transportation agencies from discussions with agency contacts and reviews of planning documents. Each case study includes an overview that provides background on each agency's historic approach to considering environmental mitigation in transportation planning, the approach taken to meet SAFETEA-LU Section 6001 requirements, and the challenges encountered and lessons learned during these activities. Where possible, information about agencies' future mitigation and consultation efforts is also presented.

- **Baltimore Regional Transportation Board's (Baltimore, MD) case study** explores how the agency collaborated with the State highway administration and other stakeholders and developed a series of land use/land cover, green infrastructure, and watershed maps to include in the LRTP update.
- **Capital District Transportation Committee's (Albany, NY) case study** examines how CDTC became a more active participant in transportation project development discussions as a part of the process to update *New Visions 2030*, its LTRP.
- **Illinois DOT's case study** considers how review of other agencies' approaches to including environmental factors in transportation planning could be a useful strategy for addressing Section 6001 requirements.
- **Maricopa Association of Governments' (Phoenix, AZ) case study** describes the agency's use of a three-step process for addressing Section 6001 consultation requirements, as well as its development of framework studies that assess transportation and environmental issues for regions not fully covered in the LRTP.
- **Mid-Ohio Regional Planning Commission's (Columbus, OH) case study** discusses how the agency coordinated with the State DOT and partnered with watershed planning groups to address environmental mitigation.
- **Minnesota DOT's case study** focuses on the agency's implementation of a wetlands banking system and programmatic mitigation for historic bridges, which allows it to preserve 24 eligible bridges in perpetuity to mitigate potential future impacts to the state's other bridges.
- **Montana DOT's case study** demonstrates the agency's use of existing business procedures, including a corridor planning process, to guide consultation and mitigation efforts.
- **The Piedmont Triad MPOs' (North Carolina) case study** details its coordination with a regional transit agency to create a uniform consultation approach and consistent environmental mitigation language that could be included in all of the Piedmont Triad MPOs' LRTPs.
- **San Diego Association of Governments' case study** illustrates the region's historic involvement with environmental conservation efforts, including development of a mitigation program that allocates funds to protect, preserve, and restore native habitat disturbed by transportation-related construction.

Case Study: Baltimore Regional Transportation Board

Overview

The Baltimore Regional Transportation Board (BRTB) is the MPO for the Baltimore and Annapolis, Maryland, regions. BRTB serves six jurisdictions, including Anne Arundel, Baltimore, Carroll, Harford, and Howard counties, as well as the city of Baltimore (see Figure 1). The Maryland State Highway Administration (MDSHA), one of the six modal administrations of the Maryland Department of Transportation, is responsible for 31,634 road miles and ensuring that the transportation system can meet the state's transportation needs while addressing future demand.

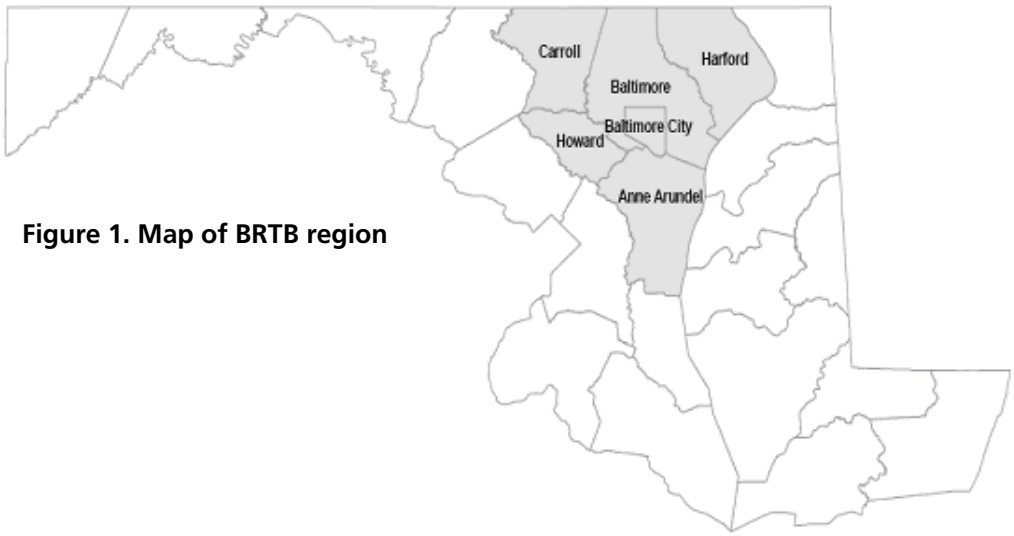


Figure 1. Map of BRTB region

Historically, BRTB had addressed environmental mitigation using a regional approach while MDSHA had addressed mitigation on project-by-project basis. As an example of BRTB's historic approach, the BRTB's 2004 LRTP, *Transportation 2030*, discussed watershed management and techniques for minimizing water quality impacts. It also included a method for project prioritization based on assessing, preserving, or maintaining green infrastructure such as open space or sensitive habitat areas. In addition, over the same time period, MDSHA conducted monthly interagency consultation meetings with a number of different partners, including a BRTB representative, as part of National Environmental Policy Act (NEPA) project reviews. Maryland's ongoing Smart Growth initiative, which was initially developed in 1997, is another important framework that has helped guide statewide and regional decision-making around growth, development, and preservation of natural resources.[9] When SAFETEA-LU was issued, BRTB sought to expand these existing activities to meet Section 6001 requirements.

Mitigation Approach

BRTB approached MDSHA in February 2006 to increase coordination. The request was made for several reasons. First, BRTB knew that MDSHA had existing relationships with the Federal, State, and local resource agencies as well as access to important resource data. Second, MDSHA had recently begun developing a regional mitigation approach that particularly

[9] More information about Maryland's Smart Growth initiative is available at www.priorityplaces.com/smartintro.htm#.

focused on watershed mitigation. BRTB believed that it could use MDHSA's watershed mitigation approach as part of a framework for addressing Section 6001 requirements.

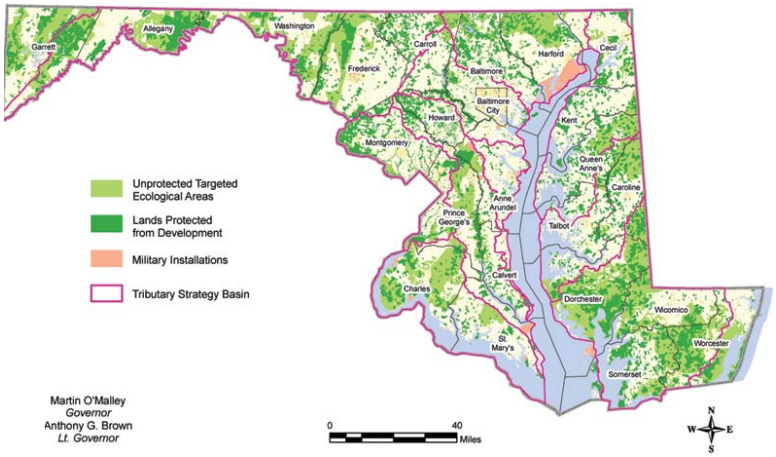
MDSHA, BRTB, and other coordination partner agencies worked together to build an inventory of environmental resources based on existing data. After reviewing this data inventory, MDSHA recommended priority information to BRTB that should be included in the LRTP update. MDSHA's goal was to ensure that mitigation approaches considered as part of long-term planning did not conflict with short-term mitigation for project development.

Considering time and resource constraints at many state agencies in Maryland, MDSHA's existing interagency coordination process provided a much needed venue for coordinating with a range of agencies. MDSHA provided BRTB with resource agency contact information for further consultation and encouraged BRTB to present issues to interagency partners and seek their input. MDSHA also provided the venue for an interagency meeting and invited the agencies to participate in BRTB's presentation on the concept of including environmental mitigation strategies in a SAFETEA-LU-compliant plan. Finally, MDSHA provided support and assistance in fielding questions and facilitating discussions during the meeting.

BRTB conducted additional meetings with resource agencies and MDSHA, and requested that agencies provide information on priority historic and natural resources. With this information, BRTB produced a series of maps to better compare the transportation plan with conservation plans. The maps produced included green infrastructure (e.g., ecologically valuable areas and corridors), protected lands and greenways, land use/land cover, and reservoir watersheds as well as other resources. Each map overlaid data from natural and historic resource inventories with proposed transportation projects and existing highways. After development, the maps were posted on an internal website for environmental coordination partners to review.

To develop the maps, BRTB used data from the state's resource agencies, MDSHA, and GreenPrint, a web-based, GIS-based program that displays Maryland's most valuable ecological parcels as well as conserved and protected land (see Figure 2).[10] GreenPrint uses geospatial data, aerial photography, and color-coded maps to display maps of critical unprotected environmental areas and protected spaces. An interactive map feature also allows users to select key layers to view (e.g., acquired protected parcels and tributary basins) from the statewide to the neighborhood scale.

Figure 2. GreenPrint map displaying unprotected and protected ecological areas



[10] More information on GreenPrint is available at: www.greenprint.maryland.gov.

In 2007, BRTB provided all of the maps and a draft environmental mitigation discussion from the LRTP to environmental coordination partners, including MDSHA, for review. The major feedback that MDSHA gave on the environmental mitigation chapter was that it preferred a strong focus on a watershed, regional approach to mitigation.

Examples of the final maps, which were developed from the consultation process with Maryland's resource agencies, are below (see Figures 3 and 4). The updated plan, *Transportation Outlook 2035*,[11] included these maps and also examples of mitigation measures that could be applied during project development.

Figure 3. Maryland green infrastructure

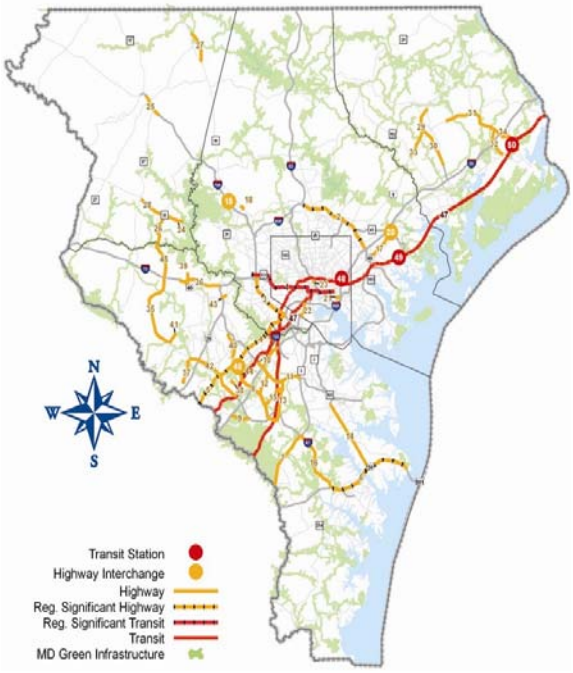
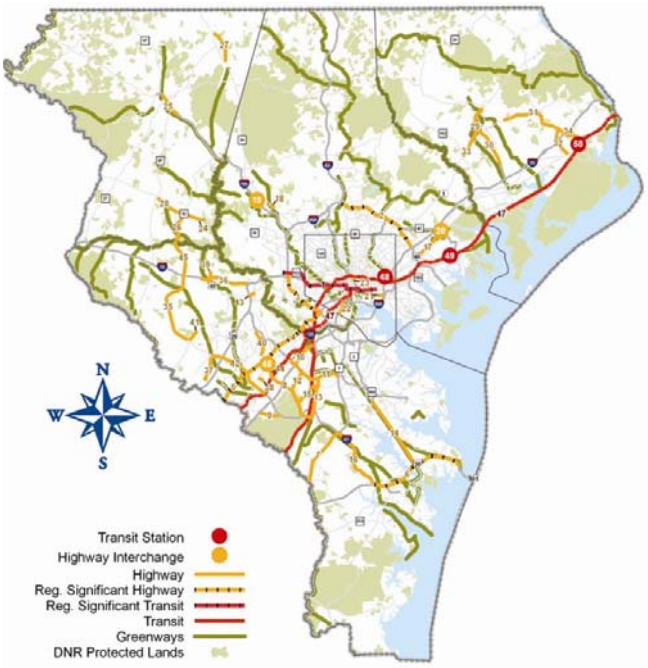


Figure 4. Protected lands and greenways



The LRTP did not directly address mitigation project monitoring or assessment, as MDSHA, rather than BRTB, typically manages mitigation outcomes.

In the future, BRTB anticipates increased coordination with resource agencies in the process of long-range transportation planning as well as coordination that goes beyond interagency review meetings. For future plan updates, BRTB may explore possibilities of mapping land cover and environmental features in a way that better explains how proposed transportation projects might impact regional environmental resources. In addition, BRTB may choose to explore possibilities for adjusting the project prioritization method to include additional environmental factors beyond just green infrastructure and air quality. Topics being discussed among MDSHA and state agencies for future implementation include advanced mitigation, mitigation banking, and criteria for determining priority sensitive environmental areas.

Challenges

Both BRTB and MDSHA reported encountering several challenges when considering mitigation in transportation planning:

[11] The full Transportation Outlook 2035 report is available at: www.baltometro.org/content/view/566/401/.

- **Lack of mitigation examples to use for modeling a regional approach**. MDSHA and BRTB recognized that a regional approach would facilitate identification of mitigation activities that provide aggregated environmental benefits, rather than project-by-project mitigation that might constrain activities to the project site. At the time of the plan update, however, there were few examples of regional mitigation applications to which BRTB could refer. No transportation projects were on the horizon that required regional mitigation and there were few examples of linking planning and NEPA at the statewide level. However, MDSHA had started to implement a regional watershed mitigation approach on several projects, including one on US Highway 301 to enhance traffic operations and address congestion. This project, while not in the BRTB region, appeared to hold promise for demonstrating a successful application of regional mitigation, but it was still in the beginning stages when the LRTP update was drafted.

  To address these challenges, MDSHA and BRTB consulted the framework from the Federal Highway Administration's (FHWA) Eco-Logical initiative. The Eco-Logical initiative promotes an ecosystem approach to transportation project development, implementation, and management. FHWA released the guiding document for the initiative, "Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects," in April 2006.[12] BRTB and MDSHA found the Eco-Logical document to be a helpful resource to improve links between planning and NEPA as well as to determine a vision for what regional mitigation might "look like."

- **Overcoming a 'business as usual' approach to mitigation**. Both BRTB and MDSHA found it difficult to encourage stakeholders to perceive mitigation from a regional and ecosystem perspective due to the state's historic emphasis on project-level mitigation. However, both agencies anticipated that a regional approach would build momentum over time especially with application of watershed mitigation to the Highway 301 project. Both agencies also believed that the process of making the 2007 LRTP SAFETEA-LU-compliant allowed them to develop more specific environmental data and better consultation processes for addressing mitigation in future plan updates.

Lessons Learned

Some lessons learned that BRTB and MDSHA reported include:

- **Achieve consensus on definitions and scale**. It is important to come to agreement on definitions used during the mitigation process, such as what constitutes proposed and potential mitigation. In addition, it is important to achieve consensus with all stakeholders on the best scale (e.g., project-specific, corridor-level, or regional) for approaching mitigation.

- **MPOs and State DOTs can work together in developing mitigation approaches**. BRTB noted several benefits resulting from working with MDSHA to address Section 6001 requirements. For example, MDSHA assisted BRTB with data-gathering efforts and provided specific language on mitigation for BRTB to include in the LRTP.[13] In addition, MDSHA's knowledge of resource agency contacts and upcoming projects helped BRTB

[12] Available at: www.environment.fhwa.dot.gov/ecological/eco_index.asp

[13] Some data were also obtained from the Maryland State Geographic Information Council (MSGIC), the state clearinghouse for geospatial information. More information about MSGIC is available at www.msgic.state.md.us/data.asp

during the consultation process and allowed them to more easily identify environmental priorities.

- **Use green infrastructure approaches as guides for visioning regional mitigation**. It can be difficult to conceive of regional mitigation because it involves aggregating activities outside a project site. Additionally, it has been difficult to find examples or guidance for how similar work has been accomplished in the past. Green infrastructure approaches and related training such as green infrastructure workshops offered by the U.S. Fish and Wildlife Service (USFWS)[14] can help stakeholders better understand and visualize regional-scale mitigation.

- **Early involvement in planning can lead to streamlined project implementation**. While some interagency coordination had always occurred during project planning at MDSHA and BRTB, both agencies reported that Section 6001 had strengthened efforts to consult with resource agencies earlier in a project's planning stages. BRTB also noted that the legislation had made its jurisdictions more aware of environmental considerations. Early coordination and awareness of environmental issues will help to identify priorities and key red flags to avoid delays in permitting or other problems later in project development. Both agencies believe that earlier engagement and coordination will, in the long-term, lead to streamlined project implementation.

Additional Resources

Maryland's Smart Growth Initiative: www.priorityplaces.com/smartintro.htm#

Maryland's GreenPrint: www.greenprint.maryland.gov.

Transportation Outlook 2035 Report: www.baltometro.org/content/view/566/401/

Maryland State Geographic Information Council: www.msgic.state.md.us/data.asp

USFWS' green infrastructure workshops: www.fws.gov/Midwest/EcoSystemConservation/training.html

[14] For more information on USFWS' green infrastructure workshops, see www.fws.gov/Midwest/EcoSystemConservation/training.html

Case Study: Capital District Transportation Committee

Overview

The Capital District Transportation Committee (CDTC) serves as the MPO for the Albany-Schenectady-Troy metropolitan area. Governed by a Policy Board comprised of locally appointed and elected officials, CDTC covers four counties (Albany, Rensselaer, Saratoga, and Schenectady), eight cities (Albany, Schenectady, Troy, Saratoga Springs, Cohoes, Watervliet, Mechanicville and Rensselaer), and other municipalities in the area. It includes representation from agencies such as the New York State Department of Transportation (NYSDOT), the Capital District Transportation Authority, and the New York State Thruway Authority. A Planning Committee carries out the technical work leading to implementation of the long-range transportation plan (or Regional Transportation Plan) and TIP.

CDTC's RTP, New Visions, was first adopted in 1997. The plan included 25 "planning and investment principles" that focused on the integration of environmental, fiscal, land use and community issues into transportation decisions. The principles have since guided the process of transportation planning in the region. New Visions was subsequently revised and updated, following extensive public involvement and working group discussions on regional transportation, land use, community, and environmental policies. The latest iteration of the plan, New Visions 2030,[15] was completed in 2007 and offers a framework for better understanding transportation issues such as traffic congestion, bicycle and pedestrian transportation, transit service, environmental quality, and urban reinvestment. The New Visions 2030 plan went beyond principles, strategies and actions of preceding plans to more fully ensure that the future of the Capital District will be one in which the transportation system appropriately supports and helps foster economic health, environmental stewardship and a high quality of life.

Mitigation issues are documented in a report titled "Meeting the Environmental Mitigation and Consultation Requirements of SAFETEA-LU: An Opportunity to Continue Moving Toward a Sustainable Regional Transportation System."[16] This report, along with fourteen other reports covering plans and processes such as finance, goods movement, and environmental justice, form the full New Visions 2030 plan.

Mitigation Approach

When determining how to best address Section 6001 requirements, CDTC reviewed examples and templates from other LRTPs. The agency also referenced resources such as the Mid-Ohio Regional Planning Council's plan, which provide a list of its natural and cultural resources.

By examining past and current activities, projects, and practices that originated from New Visions, CDTC was also able to identify particular processes and components of its program that essentially constituted environmental mitigation, although there had been no prior efforts to classify them as such. Although CDTC did not convene a separate working group to address Section 6001 requirements, it collaborated with NYSDOT (a member of CDTC's Planning Committee and Policy Board) to engage in discussions about the content to include

[15] New Visions 2030 is available at www.cdtcmpo.org/rtp2030/say.htm

[16] New Visions 2030: Meeting Environmental Mitigation and Consultation Requirements of SAFETEA-LU: An Opportunity to Continue Toward a Sustainable Regional Transportation System, available at: www.cdtcmpo.org/rtp2030/materials/em-doc.pdf

in the LRTP. The Planning Committee served as technical advisors to the project, and iterative discussions and revisions helped to shape the environmental mitigation chapter.

To document environmental mitigation activities in the plan, CDTC took the approach that it would focus on identifying potential opportunities for improving the current state of transportation. Since the MPO does not implement transportation projects, and is not always included as a participant in transportation project development discussions, initially it was a challenge to address the discussion on environmental mitigation in the traditional sense. Nevertheless, in Section I of the mitigation chapter, CDTC provided descriptions of particular programs and practices that "relate to enhancing environmental quality and promoting a sustainable regional transportation system."[17] These include:

- Analysis of ecosystem sustainability in the environmentally sensitive Pine Bush area. With growing suburbs and rising traffic volumes, there was a plan in place for a road widening project that would affect the unique habitat. The analysis resulted in the modification and down-scoping of the plan prior to the project development phase, and generated long-term strategies for preserving and protecting the habitat.

- Community and Transportation Planning Linkage Program.[18] This program provides funding for local communities to use towards integrated transportation planning and land use initiatives. Over 55 studies have been funded, many of which have resulted in local adoption of proposals for open space preservation, walkable communities, and other sustainable practices. The plan identifies improved local planning and decision-making as a critical element of the plan and for significant dampening of trends in traffic growth. This program's foundation stems from strong regional consensus that the region's quality of life and environment, mobility level, and economic vitality depend on improved local land-use planning and better integration of land-use development and the transportation system.

- Technical and staff support of the Clean Cities Coalition.[19] CDTC and the Clean Cities Coalition work together to conduct research on the types and costs of alternative fuel resources, such as bio-fuels and bio-diesel.

- Working cooperatively with the Capital District Regional Planning Commission, the Center for Economic Growth, and the University of Albany Department of Geography and Planning to explore the potential consequences related to alternative growth and development pattern scenarios in the Capital District. This produced a discussion document that provided the basis for a constructive regional and community dialogue about what policy options may be worth pursuing to manage the direction of future growth to achieve sustainable development in the Capital Region.[20]

Prior to the SAFETEA-LU Section 6001 requirements, CDTC did not possess its own GIS maps or data files related to some aspects of natural and cultural resources within the region. In

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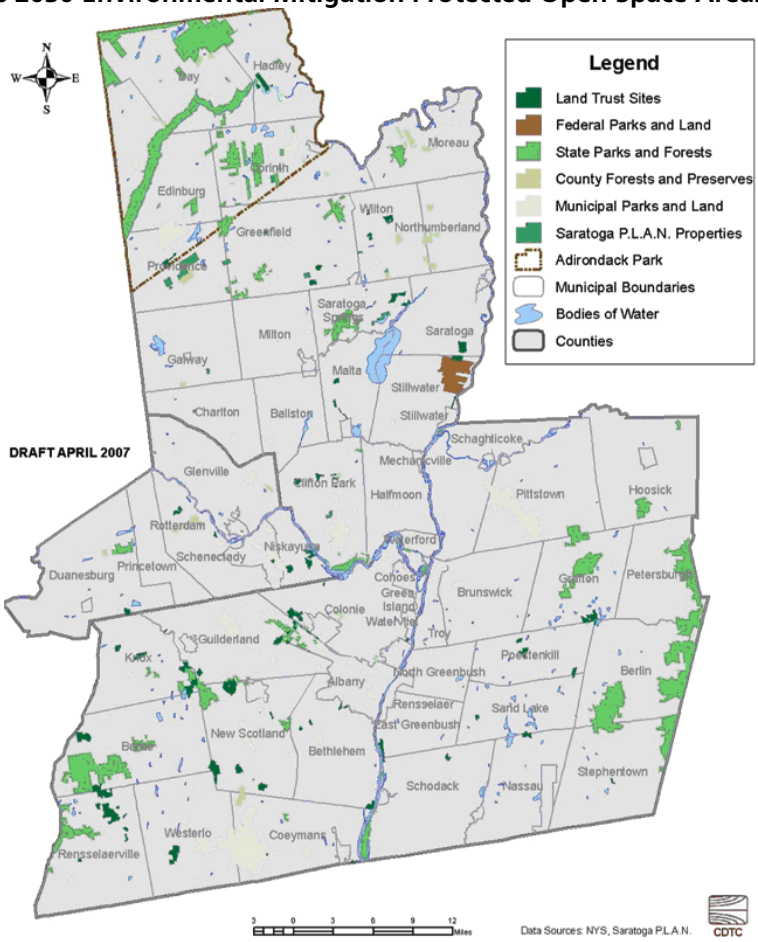
[17] Op. cit., p. 7.
[18] For more information on the CDTC Linkage Program, go to www.cdtcmpo.org/linkage.htm
[19] Information on the Clean Cities Coalition is available at www1.eere.energy.gov/cleancities/
[20] The report, "Effects of Alternative Development Scenarios in the Capital District," is available at www.cdtcmpo.org/rtp2030/materials/wa-doc.htm.

order to begin analyzing how the region's natural and cultural resources related geospatially to proposed transportation projects, CDTC acquired GIS maps and files from the Open Space Institute.[21] The MPO approached the institute after coming across a study on sprawl that the institute had authored. The report catalogued and documented the open space resources in the Capital District area--these resources included maps of existing farms, heritage areas, water areas, natural habitat, and woodlands, as well as others. With these data in hand, CDTC has mapped proposed TIP projects and natural and cultural resources to identify possible intersections and environmental impacts (see Figure 5).

Figure 5. New Visions 2030 Environmental Mitigation Protected Open Space Areas



The agency's goal is to continue to use this enhanced knowledge during the early or planning stages of transportation projects, and take action to avoid, minimize, or mitigate for environmental impacts. CDTC also believes that "mapping potential projects on a regional scale could result in potential opportunities for mitigation banking or joint mitigation activities."[22]

To address the consultation requirements of Section 6001, CDTC utilized its existing database of 1,200 individual stakeholder contacts and reviewed the list to identify any federal, state,

[21] The report is available at www.osiny.org/site/PageServer?pagename=Program_Institute_LandUseProjects_AlbanySprawlStudy&printer_friendly=1v

[22] "New Visions 2030: Meeting Environmental Mitigation and Consultation Requirements of SAFETEA-LU: An Opportunity to Continue Toward a Sustainable Regional Transportation System," p. 14.

and local entities that should be included in the consultation process. It targeted a core group of 80 contacts and sent them the draft report and letters soliciting comments and responses. Additional outreach was accomplished by leveraging the meetings of existing working groups to discuss issues such as integrating NEPA and land use. In this way, CDTC was able to interact with other stakeholders and employ various perspectives to examine the activities that it was already undertaking.

Challenges

The following constitute some of the challenges that CDTC encountered while developing the environmental mitigation chapter:

- **Utilizing a non-traditional mitigation approach**. Addressing environmental mitigation in the LRTP from a traditional, specific project mitigation perspective was initially a challenge for CDTC in that the New Visions 2030 plan does not contain a list of specific projects to be pursued. In contrast, CDTC's LRTP *New Vision 2030 Plan* and its investment principles and strategies encourage the protection of open space and environmentally sensitive areas, moderation of growth of vehicle miles traveled (VMT) to support energy conservation and air quality, and identification of opportunities for larger than project-specific mitigation of transportation impacts.[23]

- **Obtaining relevant GIS data**. As a member of the NYS GIS Data Sharing Cooperative CDTC had access to several New York State basemap GIS data layers through the NYS GIS Clearinghouse. However, CDTC had limited GIS data files relevant to environmental mitigation. By obtaining several relevant layers from the Open Space Institute, which had already completed a study on sprawl in the region and had worked with other regional planning agencies, CDTC was able to quickly and efficiently obtain data at a regional scale.

Lessons Learned

CDTC reported several lessons learned during the process of incorporating environmental mitigation concerns into the LRTP.

- **Approach environmental mitigation with a holistic view**. CDTC reported that it was useful to have a holistic view of how its region functioned together with its natural, built, and human resources, rather than considering environmental mitigation as a separate issue or check-off. Although this approach generates or requires more abstract thought and ideas, CDTC believes that it will ultimately result in avoidance of impacts to the environment. This coordinated approach includes planning for the region based on 20-year target levels of traffic (rather than trend line traffic), coupled with engagement with local communities in the development of land use/transportation plans, and funding TIP projects emerging from a local planning process consistent with New Visions principles. This approach necessitates an integrated conceptualization of land use and transportation.

- **Identify data gaps and resources early in the process**. CDTC was initially unsure of what guidance existed for the application and use of GIS for mitigation considerations, and had hoped that the Section 6001 regulations would provide more direction. Although it is part of an agency-sharing cooperative, CDTC does not own or maintain GIS data

[23] Also see FHWA/FTA Certification Review of the Transportation Planning Process November 2008 p. 106 available at www.cdtcmpo.org/cert2008.pdf.

Future Steps

CDTC's next LRTP update is due in four years. The new plan will include updates such as clarification of new legislation, details of CDTC's community processes, and particulars concerning revitalization of urban areas and growth of vehicle miles traveled. CDTC intends to continue to apply their funding priorities according to what is outlined in the LRTP. Since the TIP echoes the content in the LRTP, the plan should serve as the foundation for TIP projects. CDTC also hopes that the LRTP will be used to provide linkages between issues of concern and proposed strategies and actions, such as integrating climate change and energy concerns with a movement towards low impact development. In the near term, CDTC's main emphasis in terms of meeting the requirements of SAFETEA-LU Section 6001 will be the documentation of existing resource areas (linked to the mapping of TIP areas). Possibilities for coordinating inter-municipal environmental mitigation projects related to future transportation projects could exist, but there are no firm plans as of yet.

Additional Resources

New Visions 2030: www.cdtcmpo.org/rtp2030/say.htm

New Visions 2030: Meeting Environmental Mitigation and Consultation Requirements of SAFETEA-LU: An Opportunity to Continue Toward a Sustainable Regional Transportation System: www.cdtcmpo.org/rtp2030/materials/em-doc.pdf

FHWA/FTA Certification Review of the Transportation Planning Process: www.cdtcmpo.org/cert2008.pdf

Open Space for Tomorrow: A Capital District Sprawl and Open Space Action Strategy: www.osiny.org/site/PageServer?pagename=Program_Institute_LandUseProjects_AlbanySprawlStudy&printer_friendly=1v

CDTC Linkage Program: www.cdtcmpo.org/linkage.htm

Clean Cities Coalition: www1.eere.energy.gov/cleancities/

Effects of Alternative Development Scenarios in the Capital District: www.cdtcmpo.org/rtp2030/materials/wa-doc.htm.

Case Study: Illinois DOT

Overview

Illinois DOT (IDOT) is responsible for assuring that the State's transportation system, which includes the nation's the third largest interstate system, can meet its transportation needs while addressing future transportation demand. This effort begins in developing the state transportation plan, which IDOT last updated in March 2007.

Seeking a constructive way to communicate certain interests in depth, IDOT decided to include in the statewide transportation plan update several special reports that address a variety of subjects.[24] For example, the *Environmental Coordination and Quality of Life* report[25] was designed to demonstrate to the public IDOT's policy and approach to considering the state's sensitive areas in transportation decision-making as well as how IDOT interacts and shares information with Illinois' resource agencies.

Mitigation Approach

Historically, IDOT has not implemented environmental mitigation at an ecosystem level but rather on a case-by-case, project impact basis. Prior to SAFETEA-LU, IDOT's planning for environmental mitigation occurred only in a limited policy plan. The plan typically included a brief summary and overview of what was in the state transportation plan. Anticipating that expansion of this analysis would benefit the agency's effort to move towards a more ecosystem-based plan, IDOT searched other State DOTs' websites for examples of new approaches to incorporating environmental considerations in planning.

During this research, IDOT found that Florida DOT had developed special reports on trends and conditions that could pose threats to successful implementation of the 2025 Florida Transportation Plan.[26] IDOT also found maps of sensitive environmental resources that were incorporated in St. Louis' (the East-West Gateway Council of Government) LRTP[27] to be useful. Weighing the benefits of these models, IDOT decided to develop a number of special reports that would encourage more comprehensive, planning-level investigation of issues that affect transportation decision-making. IDOT believed that special reports would help improve the communication of information to the public, policy-makers, and other stakeholders—especially those who do not participate in public meetings. In addition, IDOT believed that the special reports would convey to the public IDOT's interest in interacting with stakeholders while documenting where the State's transportation network stands in regard to key concerns, including the environment.

The *Environmental Coordination and Quality of Life* special report was one of eight special reports that IDOT developed. This report, coincidentally, met the Section 6001 requirements—in timing and substance—for describing interagency consultation and environmental mitigation considerations. The report, which took a consultant approximately one year to develop, highlights the main environmental issues IDOT faces, as well as the resource categories for which it has well-established processes. It also provides an explanation of how IDOT interacts with other agencies regarding environmental mitigation and describes environmental programs in general.

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[24] Additional information on the special reports is available at www.illinoistransportationplan.org/.
[25] www.illinoistransportationplan.org/pdf/draft_plan07_dec/environmental_coordination_life.pdf
[26] www.dot.state.fl.us/planning/trends/
[27] www.ewgateway.org/trans/LongRgPlan/longrgplan.htm

In the future, IDOT expects that the special reports will continue to evolve, perhaps reducing some redundancy that may currently appear across the different reports. IDOT also plans to add new topic areas for special reports, such as sustainability and performance measurements.

Interaction with MPOs and Environmental Mitigation Templates

IDOT maintains an extensive partnership with the State's MPOs. For example, a designated group of staff from IDOT's central office regularly participates in MPOs' technical and policy meetings, and both technical and funding resources are shared with MPOs. IDOT provides comments and additional detail for MPOs' plans. There have been some cases in the past, however, when Illinois' MPOs expressed concern that they were being asked to develop environmental constraint maps but that limited follow-up occurred to assess the outcome of decisions based on the maps.

To address this issue as well as to help MPOs meet the Section 6001 requirement for discussing environmental mitigation, IDOT hired a consultant to produce templates for MPOs to use as guides for addressing various issues. In the environmental mitigation template, MPOs could, if they chose to do so, insert their name in placeholders included throughout. IDOT expected that the template would give MPOs time to complete more comprehensive environmental analyses to include in their respective LRTPs.

An excerpt from the template follows:

> "Environmental considerations have become integral elements in the planning and design of transportation investments in Illinois. In addition, all projects in which Federal funds are utilized, whether under state or local jurisdiction are administered by the Illinois Department of Transportation and must adhere to all state and Federal environmental laws. Thus the majority of transportation projects require a plan to protect the natural and social environment surrounding these projects. As such, IDOT has taken a proactive approach to preserving and protecting the environment and the quality of life for Illinois residents. Therefore, _____ MPO has incorporated the following discussion of environmental mitigation policies and strategies of IDOT, the key project implementer in the region and commits to facilitating similar discussions with other key implementing agencies as part of the underlying transportation planning process.
>
> **Environmental Goal**
> The goal of _____ MPO is that transportation planning and decision making, including project selection, will be integrated and coordinated with land use, water, and natural resource planning and management. The identification of a full range of environmental concerns will occur early in the transportation planning and project development process.
>
> **GIS**
> It is suggested that the MPO provide information in this section on current capabilities to map environmental resources and transportation projects and how this relates to the items mentioned above and the transportation planning process in general.[28]"

[28] The Ecological Compliance Assessment Tool (EcoCat)) is an on-line tool available through the Illinois Department of Natural Resources to help determine potential environmental impacts of certain types of proposed projects. EcoCat can be accessed at http://dnrecocat.state.il.us/ecopublic/.

The template also noted that MPOs in Illinois should make an effort to describe how they have coordinated with environmental resource agencies—a topic that produced some questions among the MPOs when SAFETEA-LU was issued. To help the MPOs enhance their interaction with the resource agencies, IDOT convened a series of meetings with MPOs and resource agencies. While this effort may have established new lines of communication, it also exposed a challenge that remains a "work in progress." Early on during the meetings, resource agency staff commented that their workloads were extensive and that they had no time to have conceptual, planning-level discussions. Instead, they noted they would like to wait until transportation projects were being developed before being involved.

Challenges

Although IDOT has good working relationships with the State's resource agencies, it is unclear whether considering environmental mitigation early on during planning in Illinois has led to streamlined project development. Because the resource agencies' constituencies can differ from IDOT's, it can be challenging to quickly develop transportation projects no matter how much planning-level coordination occurred; some resource agencies might not yet view the transportation planning stages as the best place to devote their already limited time.

Additionally, in the past there has been little consideration of mitigation performance monitoring in planning. Due to funding constraints and the backlog of repairs on roads and bridges that IDOT faces, there has been a tendency to look at condition of the transportation system as a programming decision. The focus on performance is often viewed in terms of getting and keeping the system up and running rather than thinking about what constitutes performance afterwards. By developing and publishing performance measures for mitigation at a planning stage, IDOT expects the public would have a better understanding of the breadth of work and responsibility the department manages.

Furthermore, IDOT reported that it has sometimes been difficult to encourage a regional mitigation perspective. Illinois is a state with fairly low growth and development and little demand for new highways outside the MPOs' areas. While the MPOs have been more accustomed to factoring environmental considerations into transportation planning, there has been a sense that impacts to Illinois' environment from highway projects are usually minimal due to the limited scope of highway building projects. As such, some in IDOT have perceived little need for a systems-level environmental analysis that includes mitigation.

A final challenge for making environmental mitigation considerations in planning has been that in some cases policy-level demands can create pressure to build a project where no engineering or transportation need has been demonstrated. It is sometimes difficult in planning to balance the political rationale for projects with where actual demand exists.

Lessons Learned

- **Share information with stakeholders**. In the past, some Illinois agencies were concerned about sharing too much information with counterpart agencies. According to IDOT, there was sometimes an "us versus them" attitude. Agencies would meet the requirements they faced but would not always provide information above and beyond the minimum. By promoting an open exchange of data resources, time can be freed for more robust analyses, helping to ensure that decisions are based on the best information available.

- **Consider expanding partnerships**.
  There may be an opportunity to partner with non-traditional stakeholders, such as the freight community. Given new priorities that focus on sustainability, IDOT believed that new actors could, and should, be brought in as part of a broader discussion on mitigation, transportation, and land use. In anticipation of future land use and transportation goals, IDOT believed that dedicated outreach to freight stakeholders would be useful.

Additional Resources

Ecological Compliance Assessment Tool: http://dnrecocat.state.il.us/ecopublic/

IDOT special reports: www.illinoistransportationplan.org/

Florida DOT Trends and Conditions: www.dot.state.fl.us/planning/trends/

East-West Gateway Council of Governments LRTP: www.ewgateway.org/trans/LongRgPlan/longrgplan.htm

Case Study: Maricopa Association of Governments

Overview

The Maricopa Association of Governments (MAG) is the regional planning agency for the metropolitan Phoenix, Arizona area. MAG members include the region's 25 incorporated cities and towns, Maricopa County, the Gila River Indian Community, the Fort McDowell Indian Community, the Salt River Pima-Maricopa Indian Community, the Citizens Transportation Oversight Committee, and the Arizona Department of Transportation (ADOT). MAG serves a population of approximately four million.

Prior to SAFETEA-LU, MAG included environmental considerations in corridor and sub-area studies but did not incorporate environmental mitigation into the LRTP. In addressing Section 6001 requirements prior to issuance of the final regulations, MAG sought to include as many aspects of its mitigation approach as possible in "Consultation on Environmental Mitigation and Resource Conservation," a chapter in the LRTP.[29] The process for developing the chapter was based on MAG's existing public participation approach, which allowed MAG to take a broad perspective on how environmental mitigation might be best incorporated into long-range planning efforts. In addition, the proposed FHWA and FTA transportation planning regulations, which were available in June 2006, were used to guide the consultation process. No significant changes were required in MAG's approach to the LRTP because the final regulations, which were issued in February 2007, closely followed the earlier plan.

Mitigation Approach and Consultation Process

MAG expanded on existing consultation practices and networks of contacts to minimize duplication of interagency coordination efforts. Historically, stakeholders such as ADOT and city, town, and county agencies would assess the environmental and resource impacts of adopted LRTP projects as part of the implementation process. For the 2007 update to the LRTP, MAG asked these stakeholders, as well as Federal, State, tribal, and regional environmental and resource agencies, to comment on future transportation planning efforts and elements of the plan in addition to assessing the impacts of adopted projects that they were implementing. The consultation consisted of three major steps: conducting an interagency workshop, individual agency meetings, and involving agencies in the MAG public participation process.

- **Interagency workshop**. In fiscal years 2007, 2008, and 2009, MAG held workshops at its offices involving over 25 Federal, State, tribal, and county agencies it identified from the region. The purpose of the workshops was to discuss an approach for addressing environmental mitigation while ensuring agencies' input early in project planning. Participants provided input on what types of data and information might be needed to identify mitigation needs and develop appropriate actions, as well as what data and resources were currently available from resource agencies.

- **Individual agency meetings**. As a follow-up to the interagency workshop held in fiscal year 2007, MAG scheduled one-on-one sessions with 14 key resource and environmental agencies. The purpose of the individual agency meetings was to discuss mitigation and conservation issues in more depth than was possible during the workshop. MAG solicited agency input on the available maps, plans, and data that could be used as resources for

[29] The MAG LRTP is available at: www.mag.maricopa.gov/pdf/cms.resource/RTP_2007-Update_07July.pdf

- **Participation in the public involvement process**. Agencies participating in the inter-agency workshop and individual meetings were also invited to engage in the overall MAG public involvement process, which occurred on a continual basis throughout development of the LRTP update.

As a result of the three-part consultation process and stakeholder feedback, MAG identified several priority mitigation areas, including air and water quality, noise, and habitat. For example, in the habitat area, MAG found that a key concern was to identify wildlife corridors prior to project design and construction so that appropriate mitigation measures—such as wildlife crossings, mitigation banking, or retiming construction to avoid breeding seasons—could occur. Another key concern was to establish off-site mitigation banks to maintain uninterrupted habitat. Conservation for cultural, natural, and land use (i.e., open space) conservation were other key considerations voiced by resource agencies. MAG also determined that the corridor level was the most appropriate scale for addressing mitigation in the region, since it is at this level that mitigation activities can be most closely tailored to a corridor's specific features, needs, and landscape.

Since the 2007 LRTP update, MAG has convened two sessions with resource agency stakeholders to follow-up on environmental mitigation and resource conservation issues. Currently, MAG is preparing the 2010 update of the LRTP. The ongoing public participation process for this update has provided additional opportunities for continuous interaction with resource and environmental agencies.

Framework Studies

To better consider transportation and land use from a regional perspective, MAG develops "framework studies." These are assessments of transportation needs and environmental, land use, and community development issues, focusing on regions with likely growth potential and transportation needs that are not fully covered in the LRTP. The documents describe environmental and natural features of particular regions and evaluate the potential impacts of various transportation alternatives on these resources.

The framework studies were initiated not as a result of SAFETEA-LU Section 6001 but as part of the "Building a Quality Arizona" (bqAZ) initiative,[30] an effort developed by Councils of Government and MPOs in Arizona to promote a long-term statewide vision for transportation. Three framework studies have now been completed—each focusing on a different region of Arizona—and MAG anticipates that additional studies might be developed in the future.

The studies do not explicitly focus on project-based mitigation but MAG intends to use them as resources for developing mitigation approaches, as necessary, for corridor projects once implemented. The studies, however, do consider mitigation from broader, regional or corridor-level perspectives. MAG used GIS-based data for each of the studies to produce maps that identify specific resource features and areas of potential corridor overlap.

MAG's initial contact with environmental and resource agencies during consultation for the 2007 LRTP update helped pave the way for interaction when developing the framework

[30] More information on the bqAZ initiative is available at: www.bqaz.org

studies. For example, to develop the I-8 and I-10 Hidden Valley framework study,[31] MAG engaged in cross-county consultation with some of the agencies involved in the 2007 LRTP update. First, MAG and the Central Arizona Association of Governments (CAAG) in Pinal County jointly identified key environmental features of the study area and gathered other data to develop an inventory of key regional features that transportation projects could impact. Since part of the study area includes wilderness, MAG also worked with the Arizona Wildlife Linkages Workgroup, a partnership between nine public and nonprofit agencies to identify, protect, and manage wildlife corridors while supporting wildlife habitat conservation.[32] The workgroup initiated the Wildlife Linkages Assessment project to document, inventory, and map habitat connectivity zones across Arizona. Results from the assessment were included as part of the Hidden Valley framework study to establish a baseline for evaluating mitigation measures in the study area (e.g., wildlife crossings, land protection policies, mitigation banking) that might be implemented in the future (see Figures 6 and 7).

Figure 6. Biological resources map from I-8/I-10 Hidden Valley Roadway Framework Study in Arizona

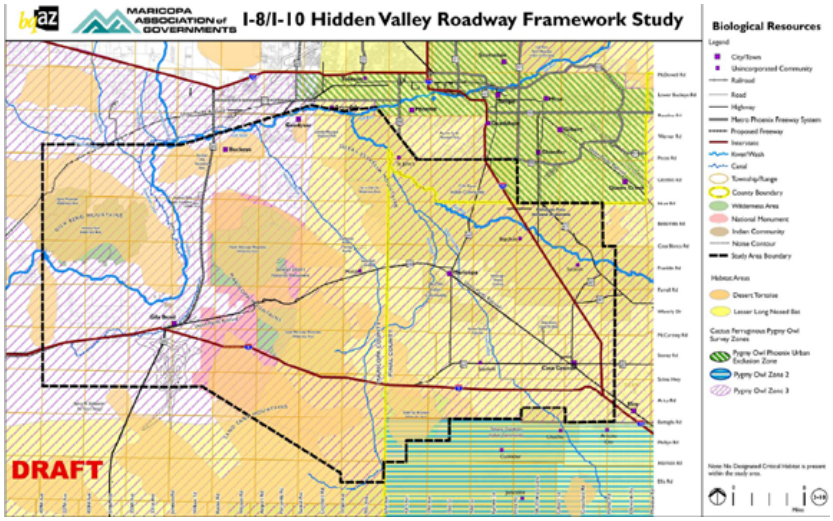
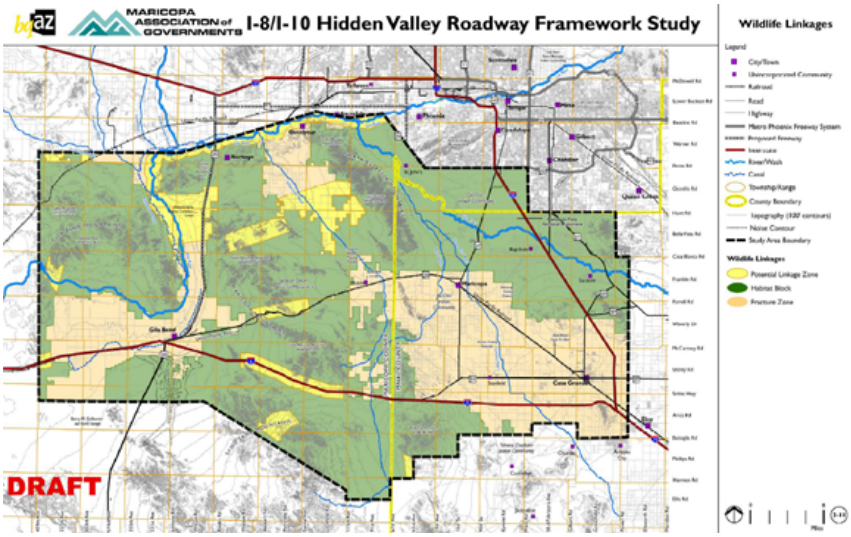


Figure 7. Wildlife linkages map from I-8/I-10 Hidden Valley Roadway Framework Study in Arizona



[31] See www.bqaz.org/hiddReports.asp?mS=m4
[32] See www.azdot.gov/Highways/OES/AZ_WildLife_Linkages/workgroup.asp

In addition to consultation with resource agencies, the framework studies contain the feedback received from extensive public participation. Outreach occurs on a continuous basis to engage the public in developing the study and identifying specific project issues.

Future Efforts
In the future, MAG might consider implementing performance measures to assess or monitor outcomes of environmental mitigation activities. However, no mitigation project has been implemented since the 2007 update to the RTP. MAG also anticipates continued work to ensure that consultation occurs early in project planning and views incorporation of mitigation considerations in transportation planning as an ongoing effort.

Lessons Learned

MAG reported several lessons learned and critical success factors for addressing Section 6001 requirements, including:

- **Maintain a broad perspective when considering environmental mitigation**. In the absence of final regulations prescribing what to include in the LRTP for environmental mitigation, MAG decided to summarize as many aspects as possible regarding its mitigation and consultation activities. MAG believed that this perspective was helpful in allowing mitigation activities to be considered more broadly than if the legislation had been overly prescriptive in its requirements.

- **Developing framework studies has led to more streamlined agency coordination**. According to MAG, the framework studies led to a number of benefits, including identification of corridor-specific environmental factors early on in project planning and appropriate resource agency contacts to expedite future consultation. The collaboration needed to develop the studies has helped establish better interagency working relationships, which MAG anticipated will facilitate a more streamlined consultation process for future LRTP updates. Furthermore, the studies have helped present a broader picture of regional transportation issues while helping to identify key environmental issues earlier in transportation planning than in the past. MAG also reported that resource agencies have received the framework studies well. Feedback has been positive and stakeholders have expressed appreciation for having opportunities to be involved at an early project stage. However, MAG has found that staff turnover at some resource agencies can make it difficult to sustain consultation efforts.

- **Section 6001 and NEPA requirements should be viewed as complementary, rather than competing, efforts**. MAG reported that its objective in meeting Section 6001 was to increase linkages between the NEPA process and environmental mitigation resource requirements at the regional level. MAG drew on existing NEPA processes when conducting mitigation consultation, which helped to streamline and avoid duplication of efforts.

Additional Resources

MAG LRTP: www.mag.maricopa.gov/pdf/cms.resource/RTP_2007-Update_07July.pdf

Building a Quality Ariziona Initiative: www.bqaz.org

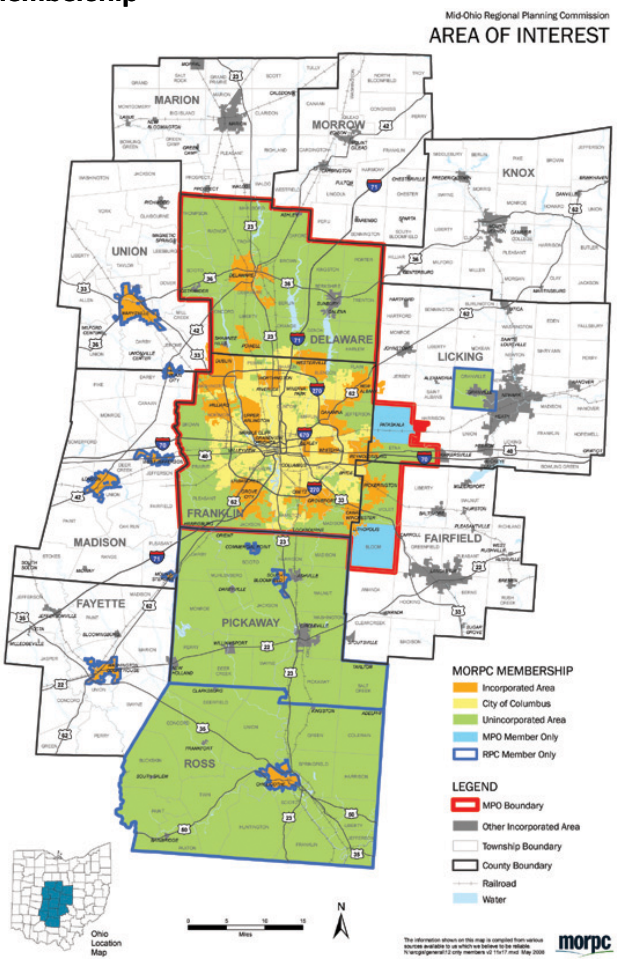
Arizona Wildlife Linkages Workgroup: www.azdot.gov/Highways/OES/AZ_WildLife_Linkages/workgroup.asp

Case Study: Mid-Ohio Regional Planning Commission

Overview

The Mid-Ohio Regional Planning Commission (MORPC) is the MPO for a four-county region in central Ohio, which includes the City of Columbus. MORPC serves a population of 1.6 million (see Figure 8).

Figure 8. Map of MORPC membership



Prior to SAFETEA-LU, MORPC had not specifically considered environmental mitigation in transportation planning. When determining how to address Section 6001 requirements during the update of its LRTP, the *CapitalWays Transportation Plan*, MORPC internally discussed an approach and then consulted with the Ohio Department of Transportation (ODOT). MORPC believed that it would be useful to coordinate with ODOT because MORPC did not have extensive experience addressing mitigation in planning. MORPC believed that ODOT had better resources at its disposal to assist with meeting the legislative requirements, including:

- Broader access to Federal, State, and local resource agencies,
- Ongoing project-level coordination with resource agencies (on which to build and expand consultation efforts),
- Access to statewide geospatial and environmental data, and
- History with implementing mitigation on a project-by-project basis.

At the same time that MORPC approached ODOT for assistance, ODOT expressed interest in developing a common approach that all Ohio's MPOs could use when addressing environmental mitigation in transportation planning. To that end, ODOT took the lead in developing a statewide framework on environmental mitigation, including developing language on mitigation for the state's MPOs to include in their updated LRTPs and consulting with resource agencies on behalf of the MPOs. The goal was to ensure consistency across LRTPs while avoiding the need for each of Ohio's MPOs to approach resource agencies with the same mitigation questions, which might unnecessarily burden resource agency staff.

Mitigation Approach in Developing the LRTP

The ODOT statewide approach to environmental mitigation was communicated to MORPC, other MPOs in the State, and resource agencies during several meetings and training sessions, including a one-day workshop conducted by ODOT. During the workshop, MPOs' environmental data needs and strategies for implementing the statewide framework were discussed. During communication with resource agencies, ODOT's goal was to address MPO's data needs for developing the LRTPs and to discuss review of the MPOs' plans.

Prior to the ODOT-led consultation effort, MORPC had involved the resource agencies as part of its public participation process for developing the LRTP, *CapitalWays Transportation Plan*, which was adopted in 2008.[33] A separate appendix was included in the *CapitalWays* plan that focused on environmental mitigation. Resource agencies were kept apprised of LRTP drafts for review and comment as well as other notices regarding development of the LRTP and appendix.

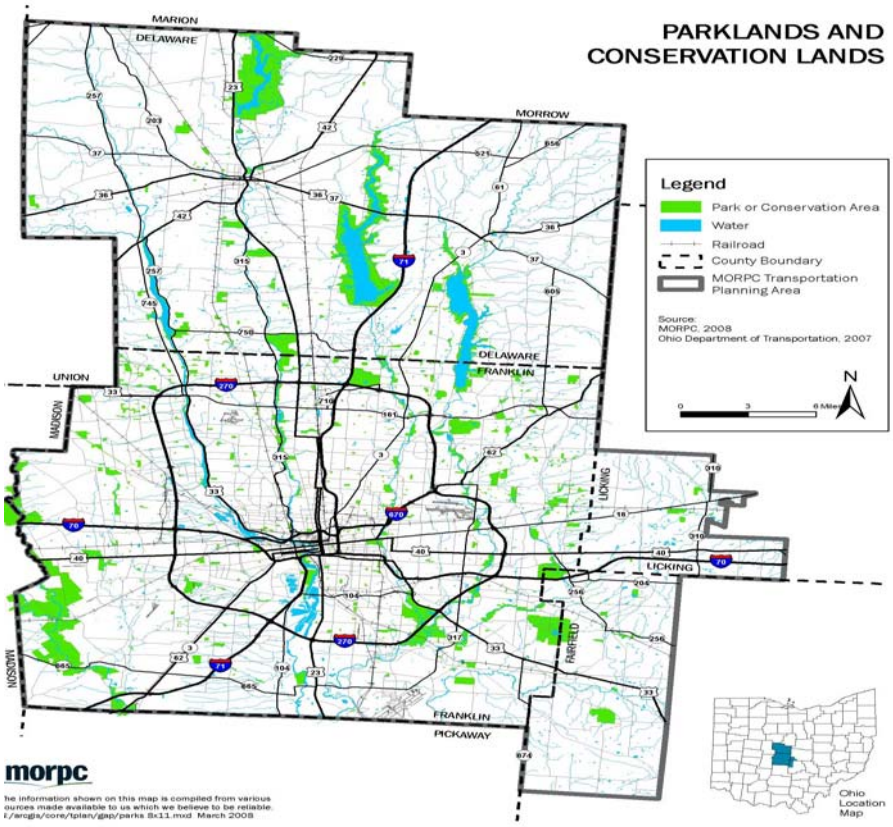
MORPC had partnered with watershed planning groups in the past. These existing relationships facilitated coordination and addressing watershed mitigation issues in the plan. MORPC conducted outreach to existing contacts was conducted to obtain data and solicit reviews of the draft environmental mitigation appendix.

As a result of the larger consultation effort that ODOT led, the ODOT identified four major environmental issues for discussion in the environmental appendix: streams and wetlands, threatened and endangered species, cultural resources, and Section 4(f) land.[34] To identify specific resources and develop maps detailing each of these issues and their interaction with transportation infrastructure, MORPC used ArcGIS software and geospatial data that agencies such as the Ohio Environmental Protection Agency and the U.S. Army Corps of Engineers, Great Lakes and Ohio River Division provided (see Figure 9).

[33] For more information on the *CapitalWays Transportation Plan*, see www.morpc.org/transportation/capitalways/capitalways.asp

[34] Section 4(f) land refers to publicly owned parks, recreational areas, wildlife refuges, or public/private historical sites that are impacted by Federal transportation projects. For more information on the DOT Act Section 4(f), see www.environment.fhwa.dot.gov/4f/index.asp

Figure 9. Map of Parklands and Conservation Lands from Ohio LRTP



MORPC noted that the map of National Historic features, a component of the LRTP environmental mitigation appendix, was not complete because geospatial data on historic properties were not readily available. The agency speculated that this might be due to the fact that historic properties are typically not identified until project alignments are chosen and then are not systematically inventoried and documented. Contacts expected that, over time, considerations of mitigation during project planning would help identify historic properties earlier than in the past and facilitate development of a more complete data library.

Outcomes from Addressing Section 6001 Requirements

As a result of addressing Section 6001 requirements, MORPC believes that the agency has become better educated about the project development process. In addition, MORPC believes that, through developing the mitigation appendix, MORPC had been able to better educate the public on regional environmental resources as well as the methods for protecting, managing, and monitoring these resources. MORPC also indicated that Section 6001 strengthens MORPC's ability to consult with resource agencies earlier in project planning and encouraged stronger working relationships between the MPO and ODOT. Overall, the heightened emphasis on environmental issues generally increases attention to sustainable modes of transportation.

Whether early consultation with resource agencies would lead to streamlined project development, however, was unknown, although MORPC staff believes it is a possibility in the long-term. It was noted that the process for project development is well-established and understood in the state. Changes to this process might take extended periods of time to evolve and become part of institutionalized, "business-as-usual" procedures. For example, in

1997, MORPC conducted a pilot project as an attempt to involve resource agencies earlier in the transportation planning process. The project helped establish the appropriate resource agency contacts for MORPC to speak to regarding project reviews. However, resource agencies expressed concerns about their ability to provide comments during the planning stage, since concrete details about projects could not be provided. This concern was repeated during Section 6001-related consultation efforts.

MORPC staff noted the agency will continue to work with ODOT to develop future plan updates on environmental mitigation, since ODOT has access to data and other resources that are helpful to MORPC. MORPC will continue to work across jurisdictional and regional boundaries or outside the MPO's boundaries to address environmental issues.

Challenges

When consulting with resource agencies, MORPC sometimes found it difficult to obtain feedback, noting that agencies were more familiar with a project-by-project approach rather than a policy-level mitigation discussion.

Some MORPC staff also reported difficulty in determining the appropriate level of detail for a regional approach to mitigation, as well as finding models for this approach. It was not always necessary to include detailed data in what would be a more general, policy-level discussion. However, it was also important to provide enough data to make the plan meaningful and specific to priority environmental areas. Some MORPC staff also believed that inherent within any policy or regional level mitigation approach was an assumption that mitigation would occur no matter what type of project was implemented. This could be problematic in terms of leading a planning agency to focus only on mitigation implementation, rather than on avoidance and minimization strategies that preclude the need for mitigation.

Additionally, geospatial data on features, such as historic properties, were not readily available despite ODOT having provided MORPC with many data layers. MORPC anticipated that as mitigation opportunities for historic sites are identified earlier in project planning, a more robust inventory for these data could be developed. MORPC also believed that future LRTPs would evolve to be more cross-cutting and inclusive of environmental and energy issues as a course of business, making the plans more conducive for considering mitigation.

Lessons Learned

MORPC reported that due to its small staff size, there was insufficient time to consider mitigation strategies when engaged in other transportation planning work. MORPC noted that some resource agencies have implemented funded positions programs. In these instances, ODOT has provided funding for resource agency liaisons to dedicate their time to transportation projects. Anticipating a better linking of planning and NEPA reviews that leads to a streamlined project development process, the liaisons are to provide dedicated review of ODOT transportation project permits. MORPC's perception is that funded positions have helped build resource agencies' capacity for addressing issues at the project level because their staff—who are now involved from the earliest planning stages—are more cognizant of the rationale for the transportation projects and any necessary mitigation.

Additional Resources

CapitalWays Transportation Plan: www.morpc.org/transportation/capitalways/capitalways.asp

Information on USDOT Act Section 4(f): www.environment.fhwa.dot.gov/4f/index.asp

Case Study: Minnesota DOT

Background

In the early 1980s, prior to SAFETEA-LU and its predecessor Acts TEA-21 and ISTEA, the Minnesota Department of Transportation (Mn/DOT) began implementing an extensive wetland banking program.[35] Before that time, Minnesota was involved only in a limited manner with wetlands permitting activities that the Minnesota Department of Natural Resources (DNR) administered. Based on the charge made by and authority given in the U.S. Executive Order 11990, *Protection of Wetlands*, in 1977[36], Mn/DOT initiated the establishment of a programmatic approach to wetland mitigation. Over the nearly 30 years following, Mn/DOT has extended this approach to other components of its overall environmental mitigation effort, including its historic bridge program. Environmental mitigation is now considered early on and often in a transportation project's life cycle, commencing in the transportation planning stage.

In June 2009, Mn/DOT completed its five-year update to Minnesota's statewide transportation plan.[37] While the plan's environmental mitigation language was included, not in response to SAFETEA-LU, Mn/DOT drafted the discussion to be compatible with and reflective of Section 6001's requirements; efforts are made to ensure that planners have considered the environmental mitigation context Mn/DOT and counterpart agencies have created over time. Specifically, the plan indicates whether Mn/DOT expects proposed transportation projects to "outpace," or be developed a rate exceeding credits made available in existing wetland banking agreements. Reinforcing the goal of developing mitigation strategies at a system level rather than at the individual project level, the plan also reiterates Mn/DOT's commitment to greater public and agency involvement and consultation to better inform the planning process.

Programmatic Mitigation for Wetlands

> *"Mn/DOT will continue to work cooperatively with wetland regulatory agencies regarding wetland permitting and to provide acceptable mitigation sites. Mn/DOT's coordination with the Minnesota Board of Water and Soil Resources is a specific resource example that has resulted in a cooperative agreement between the two agencies to facilitate the development of wetland banking sites for transportation project mitigation."*
>
> *–Excerpt from Minnesota Statewide Transportation Plan 2009—2028*

During the 1980s, Mn/DOT worked with Federal and State agencies to develop a wetlands banking system that has led to a steady state of no net loss of Minnesota's wetlands. The initial idea for the banking system was derived from a training course on habitat evaluation procedures the USFWS offered. Prior to this course, traditional mitigation practice in Minnesota involved "postage-stamp" mitigation, or small-scale enhancements made on a project-to-project basis without holistic consideration of the state's environmental resources. These traditional practices likely missed opportunities for making far-reaching environmental improvements that maximized return on mitigation investment.

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[35] Wetland banking involves the restoration, creation, enhancement, and - in exceptional circumstances - preservation of aquatic resources expressly for the purpose of compensating for unavoidable aquatic resource losses.

[36] www.epa.gov/wetlands/regs/eo11990.html

[37] Mn/DOT's *Minnesota Statewide Transportation Plan 2009—2028* is available at: www.dot.state.mn.us/planning/stateplan/index.html.

Mn/DOT began keeping records on wetlands it purchased in 1983. By 1985, it had developed an agreement, in principle, with other State agencies that would permit a wetland banking system intended to help Mn/DOT to offset transportation project impacts at a more environmentally practical scale. In 1987, a number of agencies, including the Minnesota Department of Natural Resources (DNR) and the USFWS, formalized the banking system through the signing of a MOU with Mn/DOT. FHWA supported the MOU by sending letters of concurrence.

Efforts were further solidified in Minnesota's Wetlands Conservation Act of 1991. The Act included provisions for wetland banking to avoid undermining the progress Mn/DOT and others had made in coordinating approaches. The Act made the Minnesota Board of Water and Soil Resources (BWSR) the agency responsible for both local wetland mitigation projects and the overall state bank. In the banking system that has followed, Mn/DOT is an "accountholder." Mn/DOT provides BWSR funding—approximately $1 million per year—to buy and maintain wetlands of sufficient types and sizes so that when transportation projects are constructed, banked credits exist to offset resulting wetlands impacts. This occurs well in advance of any transportation project. Mn/DOT now estimates that sufficient wetland areas have been banked to compensate for transportation projects' impacts for the next 10–15 years. Most importantly, mitigation efforts can now be focused in the areas with the highest historical loss of wetlands rather than just within the designated service areas or within the watershed or vicinity of the transportation project. In the future, Mn/DOT expects the program to become even more cost-effective as the agency shifts focus from buying credits to maintaining them.

Programmatic Mitigation for Historic Bridges

> *"Mn/DOT is committed to preserving and maintaining the 24 bridges listed…Mn/DOT…will provide training to Mn/DOT bridge maintenance workers in order to ensure that appropriate maintenance treatments are being applied to the 24 bridges identified for preservation."*
>
> *–Excerpt from the Programmatic Agreement Concerning Pre-1956 Historic Bridges*

Similar to the wetlands banking system, Mn/DOT has developed a programmatic approach to mitigating for impacts to historic bridges over the last decade. The approach, which was formalized in a MOA[38] with FHWA, the Advisory Council on Historic Preservation, the Minnesota State Historic Preservation Office (SHPO), and the U.S. Army Corps of Engineers, stipulates Mn/DOT's responsibilities for maintaining, preserving, or rehabilitating eligible historic bridges. The programmatic approach helped create an agreed upon process that could be in place before future improvement actions occurred on bridges.

To develop the programmatic approach, Mn/DOT hired a consultant to conduct an inventory of all 50-year-old and older bridges in Minnesota. With the inventory complete, Mn/DOT proposed that 24 of the historic bridges identified be preserved in perpetuity to offset potential future impacts to the remainder of the state's old bridges. In other words, Mn/DOT's mitigation would be composed of its commitment to manage and maintain the 24 designated bridges.

[38] www.dot.state.mn.us/environment/pdf_files/CRUbridgepa.pdf

While Section 106 consultation still occurs on a project-by-project basis, the programmatic approach to historic bridge preservation has helped to formalize a statewide commitment to mitigating bridge impacts and facilitating the environmental review process. FHWA recognized Mn/DOT's innovative program in September 2009 with an Environmental Excellence Award.

Additional historic bridge mitigation efforts have included development of the Stillwater Bridge endowment fund. As part of the fund, the current Stillwater Lift Bridge over the St. Croix River between Minnesota and Wisconsin is planned to be converted to a bicycle/pedestrian facility while a new, four-lane bridge is constructed downriver. As part of the MOA developed for this project, the endowment will cover operations and maintenance costs for the bridge's bicycle/pedestrian facility. A portion of the initial endowment funds were also used to mitigate for impacts that enhancements to the Stillwater Lift Bridge caused.

Future Environmental Considerations in Transportation Planning

The Minnesota DNR developed a statewide conservation agenda in 2009 to outline trends in several areas, such as growth and development, and detail strategies from a conservation perspective for addressing these trends.[39] While the statewide agenda has helped advance a broad perspective on integrated land management, widespread analysis on conservation resources at the highway corridor level in Minnesota has not occurred. Historically, there has not been much information that would help Mn/DOT develop a plan for spending transportation enhancement funding on improving environmental attributes, such as habitat connectivity.

For this reason, Mn/DOT recently hired a consultant to create habitat cover maps at the corridor level. Once the maps were developed, six habitat corridors that major highways bisected were identified. Mn/DOT and the DNR are now assessing opportunities for increasing habitat connectivity along those corridors. Currently, transportation enhancements for wildlife-related projects often originate on an ad hoc basis and not in a plan. If funding allows the effort to continue, Mn/DOT foresees using the statewide planning process to identify potential transportation, and habitat, enhancement projects.

Lessons Learned

- **Enhance regional transportation planners' awareness and understanding of the environmental mitigation context at the state level**. In Minnesota, MPOs develop their own LRTPs, which Mn/DOT then uses to devise district investment plans outlining how funding will be distributed. Due to the wetlands and historic bridge programmatic agreements that Mn/DOT has instituted, Minnesota's MPOs typically do not need to duplicate effort considering environmental mitigation for these resources. The state's MPOs usually address mitigation for impacts to other resources on a project-by-project basis.

- **Consider how to develop appropriate measures to monitor mitigation efforts**. To address Section 6001 requirements, Mn/DOT included a section on environmental mitigation in Policy 9 of its statewide transportation plan.[40] Policy 9 summarizes the agency's mitigation approach, emphasizing that systems-level solutions will be promoted rather than mitigation on a project-by-project approach. Mn/DOT also included

[39] The conservation agenda is available at: www.dnr.state.mn.us/conservationagenda/index.html.
[40] Policy 9 is available at: www.dot.state.mn.us/planning/stateplan/pdfs/7%20Policy%209%20Energy%20and%20Environment.pdf.

environmental streamlining as one of the performance measures to assess progress made towards reaching Policy 9's objectives. Mn/DOT believes that while measuring environmental streamlining is important, measuring the length of time from project inception to completion—the traditional performance metric for project delivery—could be of limited value to evaluate progress. The measure may not capture the full extent or result of benefits, such as interagency cooperation, that occurred during a project's lifecycle.

- **Find another entity in the State (e.g., State agency or a non-profit organization) to help identify new environmental mitigation strategies**. Mn/DOT needed a significant amount of time and money to establish its districts' mitigation projects, which became the foundation of the department's wetland banking program. Good working relationships with counterpart state agencies can help reduce the time and money spent on planning mitigation.

- **Use geospatial technologies to inform environmental mitigation decisions to the extent practicable**. GIS analyses on various environmental resources along Minnesota's corridors underlie most of Mn/DOT's environmental mitigation decisions. For example, Mn/DOT's Archaeological Predictive Model[41] is used to help Mn/DOT avoid impacts on archaeological sites throughout the state. Data from the model are used to inform decision-makers when specific projects necessitate avoidance, realignment, or mitigation.

  In the future, Mn/DOT plans to use geospatial technologies to develop all figures in environmental documents. Mn/DOT believes that by accompanying that effort with the coordination of all relevant regulatory agencies, the goal of completing an "environmental assessment in one day" may be possible. Before this becomes a reality in Minnesota, however, improved data—specifically for habitats and endangered species—is needed.

Additional Resources

Executive Order 11990, Protection of Wetlands: www.epa.gov/wetlands/regs/eo11990.html

Mn/DOT's Minnesota Statewide Transportation Plan 2009—2028:
www.dot.state.mn.us/planning/stateplan/index.html

Mn/DOT's Programmatic Bridge Agreement:
www.dot.state.mn.us/environment/pdf_files/CRUbridgepa.pdf

Minnesota DNR's conservation agenda: www.dnr.state.mn.us/conservationagenda/index.html

Mn/DOT's Policy 9:
www.dot.state.mn.us/planning/stateplan/pdfs/7%20Policy%209%20Energy%20and%20Environment.pdf

Mn/DOT's Archaeological Predictive Model: www.mnmodel.dot.state.mn.us/

[41] More information on the Archaeological Predictive Model is available at: www.mnmodel.dot.state.mn.us/.

Case Study: Montana DOT

Overview

The Montana Department of Transportation (MDT) has historically considered environmental mitigation as part of its project development process. Although mitigation opportunities may be identified on the corridor level during planning, they are executed on a project-by-project basis through construction projects. When considering appropriate options for mitigation, MDT's objective has always been to select an option that will allow the mitigation site to maintain itself in perpetuity without the need for ongoing maintenance. For example, for wetlands mitigation projects, the agency has historically sought to avoid use of mechanical devices that regulate wetlands flow or other mechanisms that would require monitoring or continued upkeep.

MDT has traditionally taken an approach to corridor planning during environmental document development that emphasized consultation with resource agencies and integration of ecological considerations in project development. These approaches were originally developed during the early- and mid-1990s and have evolved over time to become more formalized aspects of MDT's business procedures for project development.

When SAFETEA-LU Section 6001 was issued, these and other existing business processes, which primarily emerged from previous updates to Montana's statewide transportation plan (SWTP), already reflected Section 6001's requirements. Specifically, the Corridor Planning Process and Integrated Transportation and Ecological Enhancements for Montana (ITEEM) Process addressed early consultation with resource agencies and consideration of mitigation approaches during project planning.

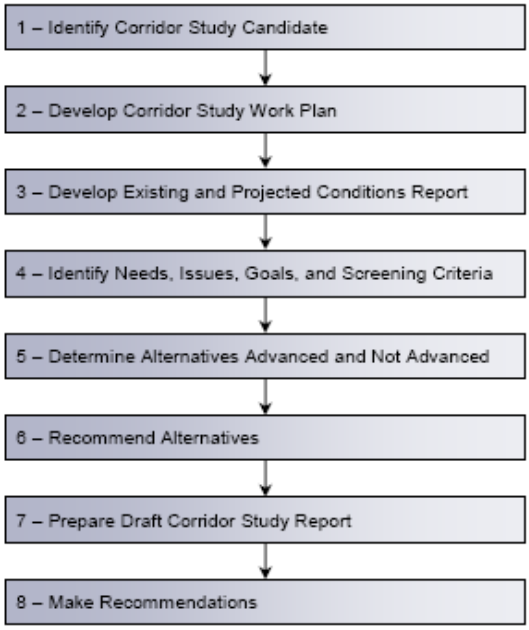
SAFETEA-LU Section 6001 provided an impetus for MDT to more thoroughly formalize and document these processes. Section 6001 also strengthened MDT's inclusion of mitigation opportunities as an explicit part of corridor planning while confirming that early consideration of mitigation at the planning stages was an effective approach.

Mitigation Approach and the Corridor Planning Process

The Corridor Planning Process provides a framework for MDT to engage in early, planning-stage consultation with resource agencies, the public, and other stakeholders to develop specific products to be used in the formal environmental review process, including purpose and need statements, identification/elimination of alternatives, and mitigation opportunities (see Figure 10). MDT formalized this process in a 2009 document that outlined linkages among the Corridor Planning Process, MDT's transportation planning process, and NEPA and Montana Environmental Policy Act reviews.[42] One of the anticipated outcomes of the Corridor Planning Process is earlier identification of environmental mitigation opportunities achieved from consultation during project planning.

[42] Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews. May 2009. Available at: www.mdt.mt.gov/publications/docs/brochures/corridor_study_process.pdf

Figure 10. MDT's Corridor Planning Process



MDT reported that it was still "too early to tell" whether the Corridor Planning Process has directly led to benefits such as streamlined project development, as no project that has been through the Corridor Planning Process has advanced through the construction stage since issuance of Section 6001. However, the project that currently has the most potential to demonstrate streamlined project development is the Libby North Corridor Study. The study assesses potential improvements to State Highway (HWY) 567/Pipe Creek Road. The highway lies in an environmentally challenging area due to its proximity to critical habitat for threatened and endangered species, including the grizzly bear. Given these considerations, it was not expected that MDT would be able to implement any roadway project in the area.

Using the Corridor Planning Process as a framework for consultation, MDT initiated a planning-level effort to engage the U.S. Fish and Wildlife Service, the U.S. Forest Service, FHWA, and public stakeholders. Outcomes from consultation included the identification of a reduced project scope that minimized environmental impacts while making safety improvements. All stakeholders reached consensus on the reduced project scope, thus precluding the need to develop an environmental impact statement and avoiding the associated costs.

Integrated Transportation and Ecological Enhancements for Montana (ITEEM) Process. ITEEM initially evolved from mandates of Executive Order (EO) 13274 in 2002,[43] which aimed to streamline environmental reviews. Later, MDT identified ITEEM's efforts as matching those of the FHWA Eco-Logical initiative, which seeks to promote an ecosystem approach to transportation project development, implementation, and management.[44]

In April 2006, FHWA released "Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects," [45] a framework document for Eco-Logical. Shortly after the release of the Eco-Logical guiding document, MDT and an Interagency Review Teem (IRT) integrated the

[43] EO 13274 can be found at: www.archives.gov/federal-register/executive-orders/2002.html.
[44] More information on FHWA's Eco-Logical initiative is available at: www.environment.fhwa.dot.gov/ecological/eco_index.asp.
[45] Available at: www.environment.fhwa.dot.gov/ecological/eco_index.asp

ITEEM process into the Eco-Logical process, seeking to promote a similar ecosystem approach for Montana. In April 2008, MDT, FHWA, and several Federal and state resource agencies signed a Memorandum of Understanding to formalize the IRT.

ITEEM's goal is to:

> [S]treamline transportation program delivery while applying more effective ecosystem conservation. More specifically, the goal of the ITEEM process is to collaboratively identify, within an identified region, issues and opportunities for larger scale ecological conservation or restoration projects to offset adverse impacts for multiple transportation projects within that given region. – *Developing the "Integrated Transportation and Ecological Enhancements for Montana Process": Applying the Eco-Logical Approach*[46]

ITEEM seeks to apply Eco-Logical principles to "real-world" transportation projects. In addition, ITEEM functions as a framework to allow MDT to transfer its ecosystem approach to project sites statewide. Steps in the framework include close collaboration with agencies and project stakeholders to:

- Define and document boundaries for an affected region,
- Collect relevant data such as road densities, plant and animal species, and land ownership,
- Prepare materials for an ITEEM workshop that identifies potential approaches to addressing project impacts through mitigation, conservation, or large-scale environmental restoration,
- Conduct an ITEEM workshop and document outcomes, and
- Develop measures of success for chosen approaches.

MDT is currently piloting ITEEM for projects along Montana HWY 83 near the town of Seeley Lake, Montana. The final report summarizing efforts from the HWY 83/ITEEM pilot study is anticipated to be available in fall 2009. MDT considers ITEEM as part of the Corridor Planning Process but reported that ITEEM might not be applicable for every corridor. The agency reported that ITEEM is a worthwhile "tool in the toolbox" for addressing the requirements of 6001 as well as mitigation considerations, but not the only tool for doing so. For example, the Systems Impact Action Process, Highway Economic Analysis Tool, and Quantm are other resources that have helped MDT address Section 6001 requirements:

Systems Impact Action Process (SIAP). The SIAP, initially developed in the mid-1990s, provides a framework and checklist for MDT's review of transportation projects that are initiated by external stakeholders and that have impacts above a certain threshold. Through the SIAP framework, MDT engages in coordination with relevant parties (e.g., developers and state agencies) to address transportation impacts. MDT reported that SIAP reflects Section 6001's aim of facilitating earlier agency consultation and identification of mitigation opportunities during planning stages.

Highway Economic Analysis Tool (HEAT). Developed by Cambridge Systematics, HEAT enables agencies to understand the relationship between changes in highway capacity and economic development. HEAT incorporates a broad range of quantitative metrics to provide an objective, consistent, efficient, and accurate way to evaluate the potential economic benefits of highway improvements. For MDT, HEAT was developed in 2002 during the second major update to *TranPlan* 21, Montana's SWTP. HEAT is a tool used to help MDT assess the

[46] Available at: www.mdt.mt.gov/research/docs/research_proj/integrated_transportation.pdf

effectiveness of a variety of transportation projects, such as operations enhancements or corridor improvementss. Effectiveness is measured in terms of safety, environmental and transportation factors, among others. HEAT can be applied to assess the costs and benefits of numerous transportation-related projects, including proposed mitigation approaches. Currently, MDT operates their version of HEAT in-house to help prioritize statewide highway investment decisions.

Quantm. Quantm is a GIS-based route optimization tool. The tool considers thousands of alignment options to determine the most cost-effective route that also avoids and minimizes environmental and other impacts. Using the tool, MDT can optimize routes at a planning level to minimize costs and avoid sensitive areas. MDT reported that Quantm was a valuable tool for identifying avoidance and minimization strategies.

To explicitly address Section 6001 requirements in the 2008 amendment to *TranPlan 21*, MDT developed a Draft Policy Statement focused on environmental mitigation.[47] The draft statement outlines the requirements of the legislation as well as existing business systems, such as SIAP and HEAT, which matched the legislation's intent. In addition, the policy statement reviewed aspects of the existing *TranPlan* 21 that reflected Section 6001. For example, Policy B of the Land Use and Transportation Policy Goal states that MDT will "consistently apply MDT's Systems Impact Action Process to ensure developers equitably mitigate their impacts to the highway system."[48]

As part of addressing 6001requirements, MDT also proposed adding an action item to *TranPlan* 21 that better positioned the Corridor Planning Process as a mechanism to allow early resource agency consultation. The action item, which was added to the plan's Roadway System Performance Policy Paper, specifies that MDT will "continue to use the corridor planning process to consult with resource agencies in identification of environmental sensitivities, avoidance areas, or potential mitigation measures."[49]

Consultation

In line with Section 6001, the Corridor Planning Process and ITEEM encourage and guide consultation with resource agencies, the public, and other stakeholders. However, to explicitly fulfill the consultation requirements of Section 6001, MDT conducted outreach to resource agencies to solicit comments on existing MDT environmental mitigation processes. Agency representatives' feedback indicated that existing mitigation processes worked well but that participation in project planning would be beneficial. MDT included a draft policy statement in *TranPlan 21* to summarize the outcomes of and list the agencies contacted as part of the effort.

MDT did not receive any inquiries from MPOs regarding how they should address Section 6001 requirements, but MDT proactively conducted outreach to the MPOs after issuance of the legislation and prior to the 2008 amendment of *TranPlan* 21. To better understand MPOs' needs in the mitigation area, MDT hired a consultant to scan MPOs' LRTPs. The consultant then provided recommendations on how MDT could best assist MPOs to comply with

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[47] Limited Amendment TranPlan 21 to Comply with SAFETEA-LU: Draft Policy Statement and Supporting Background Material. Task 2.3—Environmental Mitigation. June 2007. Available at: www.mdt.mt.gov/pubinvolve/tranplan21_amend/docs/finaltask_%202.3_environmental_mitigation.pdf

[48] www.mdt.mt.gov/publications/docs/brochures/tranplan21/accessmgmt.pdf

[49] Action B.7 from Roadway System Performance Policy Paper is available at: www.mdt.mt.gov/publications/docs/brochures/tranplan21/roadwaysysperf.pdf.

SAFETEA-LU's environmental requirements. Recommendations from this effort were considered by the MPOs during their plan updates and many were implemented, such as a recommendation to develop and include resource maps in the LRTPs. MDT also offered to assist MPOs with geospatial data-gathering efforts, although the MPOs had their own GIS-based data or obtained data from the Montana State Natural Resource Information System Geographic Information Clearinghouse, the state's library for GIS data.[50]

In addition to MDT's consultation with MPOs, MDT worked with FHWA's Montana Division Office to identify appropriate contacts at resource agencies and in Tribal governments with whom MPOs could consult for developing mitigation approaches or for engaging in Tribal consultation. MDOT compiled contact information in a list, which was provided to MPOs.

Prioritizing and Monitoring Mitigation

Mitigation monitoring is done on a project-by-project basis, and there is currently no formal process in place to evaluate and assess what might be determined to be a priority mitigation project. However, a process for assessing baseline data for wetlands is outlined in the Montana Wetland Assessment Method manual.[51] Evaluation of wetlands includes rating the quality and extent of wildlife habitat features, short- and long-term surface water storage, and level of biological activity observed. The manual also includes a map of Montana's major watershed basins.

While monitoring was not initiated in response to Section 6001, the legislation did provide an impetus to strengthen and improve monitoring as a whole. MDT also noted a national trend emphasizing development of performance measures that has facilitated the improvement of monitoring processes over time. Reports assessing outcomes from specific wetland mitigation projects are produced on an annual basis. To develop these monitoring reports, MDT collects information on several wetlands features, including vegetation, soils, wildlife, and hydrology.

Prioritization of mitigation projects occurs on an informal, case-by-case basis and involves compromise and cooperation from both MDT and relevant stakeholders. MDT noted, however, that the Quantm GIS-based tool has been useful in helping to identify the most cost-effective roadway projects that involve the least amount of impact on natural and other resources. Quantm has also helped to generate and provide to stakeholders an understanding of the issues and challenges associated with new alignments in order to gain consensus on whether or not to pursue a project.

While no specific wetland mitigation project has been through the complete feasibility-to-construction cycle since issuance of Section 6001, MDT anticipates use of existing business processes, such as the Wetland Assessment Method manual and monitoring reports, for assessment purposes.

Lessons Learned

MDT reported several outcomes from its efforts to address Section 6001 requirements. First, MDT reported that Section 6001 has been advantageous in providing a formalized means for conducting early coordination with resource agencies, Tribal governments, local planning organizations, and others, particularly during corridor planning.

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[50] More information on the Montana Geographic Information Clearinghouse is available at: http://nris.mt.gov/gis/.
[51] Montana Wetland Assessment Method manual (March 2008) is available at: www.mdt.mt.gov/other/environmental/external/wetlands/2008_WETLAND_ASSESSMENT/2008_MWAM_MANUAL.PDF.

As the Corridor Planning Process and ITEEM developed and evolved over time, MDT also found that:

- **The corridor level is the most appropriate scale for early consideration of mitigation opportunities**. Mitigation or avoidance considered holistically rather than piecemeal (i.e., on a project-by-project basis during development) can be better targeted to priority environmental areas and, as a result, help to minimize impacts. MDT believed that waiting until the project development process to consider mitigation, on the other hand, increased the potential of permitting delays and higher project costs. Early coordination at the planning level helps minimize impacts and gain consensus, which is helpful in facilitating efficient project delivery.
- **Increased stakeholder involvement** in project planning helps to avoid conflict while setting a stage for streamlined project development in the future.
- **Realistic project cost estimates could be developed more easily** because stakeholders were involved early in project planning. MDT reported that one of the challenges encountered in addressing mitigation approaches is identifying funding sources. Funding is required to implement mitigation approaches but it has sometimes been difficult to identify source of funds and obtain funds.

Additional Resources

Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews:
www.mdt.mt.gov/publications/docs/brochures/corridor_study_process.pdf

Executive Order 13274: www.archives.gov/federal-register/executive-orders/2002.html

Developing the "Integrated Transportation and Ecological Enhancements for Montana" Process:
www.mdt.mt.gov/research/docs/research_proj/integrated_transportation.pdf

MDT Limited Amendment TranPlan 21 to Comply with SAFETEA-LU:
www.mdt.mt.gov/pubinvolve/tranplan21_amend/docs/finaltask_%202.3_environmental_mitigation.pdf

MDT Policy Papers: www.mdt.mt.gov/publications/docs/brochures/tranplan21/accessmgmt.pdf
www.mdt.mt.gov/publications/docs/brochures/tranplan21/roadwaysysperf.pdf

Montana Geographic Information Clearinghouse: http://nris.mt.gov/gis/

Montana Wetland Assessment Method Manual:
www.mdt.mt.gov/other/environmental/external/wetlands/2008_WETLAND_ASSESSMENT/2008_MWAM_MANUAL.PDF

Case Study: Piedmont Triad MPOs

Overview

The Piedmont Triad MPOs of North Carolina comprise four of the state's 17 MPOs: the Burlington-Graham MPO, the Greensboro Urban Area MPO (GUAMPO), the High Point MPO, and the Winston-Salem Urban Area MPO (see Figure 11). Together, these MPOs serve part or all of eight North Carolina counties.

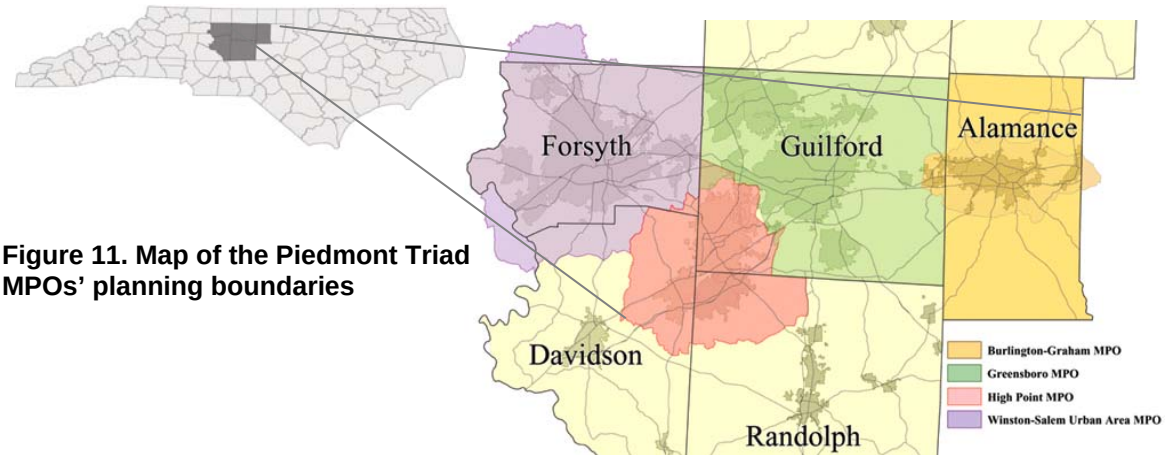


Figure 11. Map of the Piedmont Triad MPOs' planning boundaries

Prior to Section 6001, discussions of environmental mitigation in the Piedmont Triad MPOs' LRTPs seldom occurred in the region. At the time, none of the LRTPs mentioned potential environmental mitigation strategies, although the contacts indicated the MPOs were interested in doing so. When developing the update to the current LRTPs, the Piedmont Triad MPOs sought guidance from FHWA's North Carolina Division on meeting the new SAFETEA-LU requirements. North Carolina had previously implemented a successful, flexible air quality consultation process, which was the result of several iterations through the transportation conformity process and the need to comply with the requirements of 40 CFR Parts 51 and 93. The North Carolina FHWA Division Office suggested use of a similar approach for integrating environmental mitigation opportunities into transportation planning. One identified challenge was ensuring that resource agencies were involved in the environmental mitigation approach. Historically, regulatory requirements and staffing constraints have required resource agencies to focus on requirements at the project level rather than at the level of the LRTP.

To address this issue, the Piedmont Authority for Regional Transportation (PART),[52] a regional transit agency responsible for conducting transportation conformity and travel demand modeling for the Piedmont Triad MPOs,[53] volunteered to help identify and engage resource agencies in the environmental mitigation consultation effort. PART also helped the MPOs determine what environmental mitigation language should be included in their LRTPs. Since their planning boundaries are adjacent, the Piedmont Triad MPOs expected that regional

[52] The North Carolina General Assembly formed PART in 1997 to help address transportation issues at a holistic, regional level. Article 27, GS160A.

[53] In 2004, the Piedmont Triad MPOs and PART signed a Memorandum of Understanding (MOU) that made PART the custodian for Triad region's travel demand model and transportation conformity process. It was expected that by conducting one air quality conformity analysis on the same time schedule for the entire region, instead of four separate analyses, the analysis would be improved and duplication of effort avoided. In addition, this approach is more consistent with the conformity process 40 CFR Parts 51 and 93.

coordination during the long range planning process would likely yield consistent and effective LRTPs.

Mitigation Approach: PART's Role

In 1989, the North Carolina Department of Transportation (NCDOT) initiated a highway program to improve statewide connectivity. The $10 billion, 12-year program sought to have a major highway within close proximity of all the state's citizens.[54] During the widening of Interstate 40 (I-40), a highway that runs through the Triad region, it became apparent that comprehensive coordination among the MPOs did not exist. For example, the Piedmont Triad MPOs are divided across three NCDOT Highway Divisions. During the I-40 improvements, one Highway Division had finished construction when another Division had not planned to begin construction for another year or two. To improve coordination among the Triad MPOs, elected officials and transportation professionals for the Cities of Greensboro, High Point, and Winston-Salem convened to discuss transportation-related issues in the Triad region. Those attending the meeting agreed that better planning needed to occur to improve the region's transportation systems. Participants believed that a lack of communication and planning at the regional level were contributing factors to congestion and a diminishing quality of life.

After SAFETEA-LU was issued, the Piedmont Triad MPOs met to discuss upcoming LRTP updates and particular sections for which coordination might offer benefits. The environmental mitigation discussion was one of these sections. Ultimately, the Triad MPOs decided that PART would assist them to conduct resource agency consultation as well draft the potential environmental mitigation strategies included in the plans.

Consultation

To begin the required consultation process, the FHWA North Carolina Division convened a meeting of all of North Carolina's MPOs to explain how and when consultation with and outreach to resource agencies should occur. During the meeting, FHWA provided the MPOs with an initial list of resource agency contacts, which PART later expanded to ensure as many relevant perspectives as possible were gathered. Because some issues affect one MPO more than another and because of the administrative structure of resource agencies in North Carolina (e.g., some of North Carolina is served by the Wilmington District of the Corps of Engineers, some by the Asheville District, and some by the Savannah District), the Piedmont Triad MPOs found it necessary to revise the contacts list to make in more precise and applicable to their needs.

As a second step in coordinating consultation efforts, NCDOT arranged several meetings with the MPOs and resource agencies, including a two-day workshop to discuss Section 6001 requirements and their effects on regional and statewide transportation planning activities. At the meetings, the resource agencies agreed to provide input on the environmental mitigation discussions that MPOs sent.

Discussion with the Piedmont Triad MPOs and PART indicated an expectation that the consultation efforts will save time when making future environmental mitigation considerations during LRTP development. In the future, initial outreach and time spent determining appropriate agencies and persons to contact will likely not need to be repeated to the same extent.

[54] This construction program remains uncompleted in 2009.

Early in the consultation process, it became apparent that there was some confusion among the resource agencies about what they believed should be included in the mitigation discussions of the MPOs' plans. One Piedmont Triad MPO commented that some resource agencies had a philosophy of "I don't know what I want, but I'll know when I see it."To better address and manage expectations, the MPOs believed that it would be more productive to provide resource agencies with draft text to which they could respond, instead of continuously refining the text without knowing the resource agencies' reaction.

To provide uniformity or a "common ground" across MPO jurisdictions, PART and the Triad MPOs agreed that PART would be the primary author of draft template language on environmental mitigation. The language would be provided to the MPOs to integrate and individually adapt as necessary in three sections of their LRTPs, including the environmental mitigation section.[55] The decision to create consistent environmental mitigation language was based on several factors:

- Regional cooperation could best advance environmental mitigation activities that potentially cross jurisdictional boundaries.
- Having only one entity—instead of four separate MPOs—request resource agencies' input would provide time- and cost-savings.
- Promotion of mitigation predictability could ensure that the public and private sectors could identify likely mitigation activities regardless of the district or region where the transportation project was located.

The language PART created for the MPOs' LRTPs evolved from examples from other states that had already drafted environmental discussions and local knowledge of past projects from North Carolina's resource agencies' staff. Some MPOs in other states had addressed the new Section 6001 requirements in their plans before the Piedmont Triad MPOs updated their LRTPs. PART researched what these peer MPOs included in the LRTPs and determined what parts of their environmental mitigation discussions might be applicable in the context of North Carolina. The MPOs also considered preliminary best practice suggestions from FHWA. The findings from this research were compiled into a table outlining mitigation strategies for addressing different types of impacts (see Figure 12).

According to one of the Piedmont Triad MPOs, the entire consultation and environmental mitigation map development processes took approximately two years to complete.

Figure 12. Excerpt from Mitigation Strategies Table.

Impacts	Mitigation Measures
Air Quality	• Designate pedestrian/transit oriented development areas • Adopt local air quality mitigation fee program • Develop energy efficient incentive programs • Adopt air quality enhancing design guidelines • Fund Transportation Control Measures program
Archaeological	• Archaeological excavation • Design modifications to avoid area • Educational activities

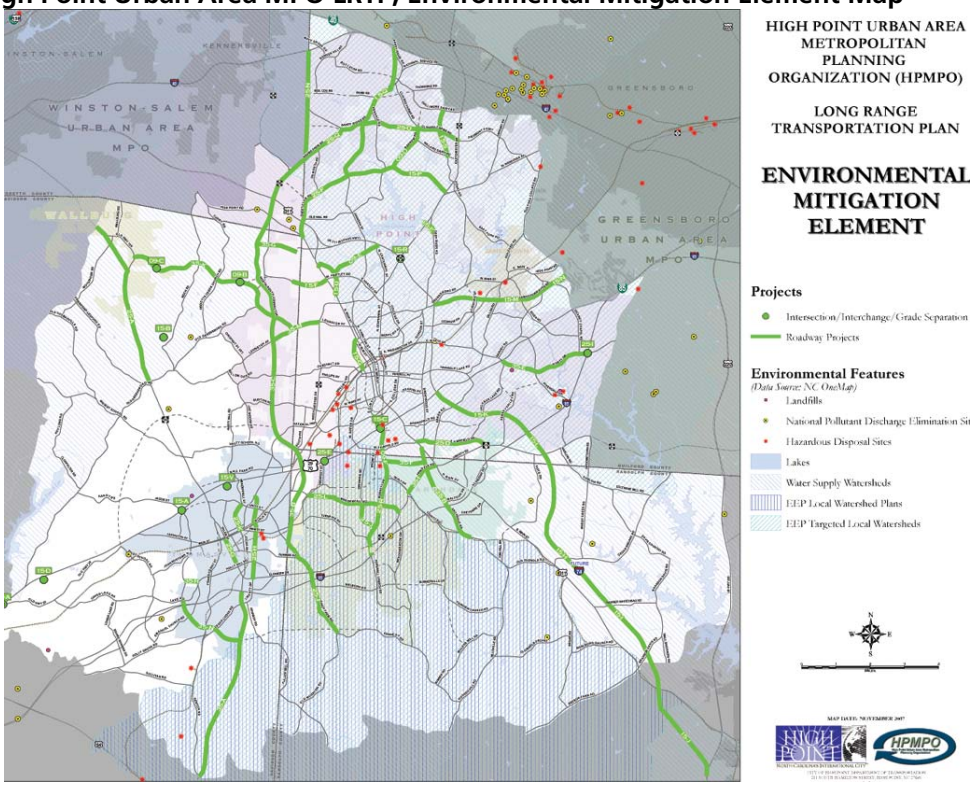
[55] Other sections for which PART provided assistance were freight planning and transit planning.

Community Impacts	• Bridge community • Sidewalks • Bike lanes • Develop recreational areas • Traffic calming • Oral history project

Mapping

While PART provided the groundwork language for the MPOs' mitigation discussions, each MPO developed its own maps. One example is the High Point MPO's Environmental Mitigation Element Map (Figure 13), which was specifically produced in response to Section 6001's requirements. It is based on data from North Carolina's Center for Geographic Information and Analysis, a statewide resource for geospatial data. In the future, High Point MPO intends to update the map to include data on section 6F boundaries (land and water conservation) and known historic properties. Since some of High Point MPO's proposed projects are near these resources' boundaries, the MPO believes early identification of potential issues in these areas in the long range plan phase could help avoid delays when projects are being implemented.

Figure 13. High Point Urban Area MPO LRTP, Environmental Mitigation Element Map



Challenges

In many cases, the resource agencies did not respond to PART's consultation outreach. As a result, the MPOs individually followed up with non-responding resource agencies to ensure adequate consultation. When comments were received, the MPOs summarized the resource agencies' issues and concerns. In the Appendix B of its LRTP,[56] GUAMPO outlined all public outreach efforts to develop the plan and included direct communications from resource

[56] GUAMPO's LRTP Appendix B is available at: www.greensboro-nc.gov/NR/rdonlyres/E240354D-DD88-4124-83F5-EED640E75391/0/AppendixBPublicInvolvement.pdf.

agency stakeholders mitigation issues and opportunities. PART's initial memorandum requesting resource agency input on mitigation needs was also included in this appendix.

Some Piedmont Triad MPO staff also indicated that while they made suggested changes to environmental constraints maps, sometimes they did not understand the relative importance or significance of the resources they were mapping. Instead, important resources would not be identified until a transportation project was being implemented. MPOs reported that future efforts might involve focusing outreach efforts to resource agencies on helping them gain a clearer understanding of how transportation projects might impact resources.

An additional challenge mentioned was difficulty gathering data to build the environmental maps included in the LRTP. The NC OneMap Program, a state initiative developed in 2003 to provide consistent, accurate, statewide geospatial data in 37 areas, has greatly facilitated data-gathering.[57] Prior to this program, however, obtaining data layers could be difficult. One Triad MPO mentioned that its efforts to collect data available from resource agencies' websites. This could be a cumbersome and time-consuming process; data were not always readily accessible via the websites or a specific data layer needed by the MPO was not available.

To better address data-gathering challenges, one of the Triad MPOs reported using the One North Carolina Naturally Conservation Planning Tool, which is available through the North Carolina Department of Natural Resources (DENR).[58] The tool support statewide land use planning and offers several related data layers, including open spaces, biodiversity and habitat, and agricultural lands. To augment the information included in the Conservation Planning Tool, the MPO stated that it was establishing more detailed GIS data to provide to DENR for inclusion in the tool.

Lessons Learned

The Piedmont Triad MPOs reported several lessons learned related to development and implementation of mitigation approaches. Several of these lessons learned are summarized here:

- **Consider regionalism in environmental mitigation approach**. Some contacts believed an approach similar to that used in the North Carolina Piedmont Triad region might also work for larger MPOs in other areas. In deciding to have one agency draft regionally applicable mitigation language, the Piedmont Triad MPOs maintained a regional perspective on their respective transportation systems and environmental resources.
- **Some degree of "give and take" is necessary to help keep the bigger, regional picture in view**. One of the Piedmont Triad MPOs reported that regardless the amount of help received, it is necessary to go through a process at least once to understand how it should work and how it can be improved. Cooperation and compromise are critical ground rules to adopt as coordination across jurisdictional boundaries proceeds. Although neighboring MPOs' may have slightly different contexts in which they work, there are likely shared goals. Accomplishing these goals may require exploring new approaches to working with those who may not have previously been partners.

[57] More information on NC OneMap is available at: www.nconemap.com/Default.aspx?tabid=289#initiative.
[58] More information on the Conservation Planning Tool is available at: www.onencnaturally.org/pages/ConservationPlanningTool.html.

- **Consider joint approaches to environmental mitigation and environmental justice**. In the future, contacts expect that environmental justice considerations will play a more prominent role in the Piedmont Triad MPOs effort to plan for environmental mitigation. It is not uncommon to have multiple different environmental justice maps that are kept separate from other environmental resource maps. Overlaying environmental justice and environmental mitigation maps can help identify issues not previously addressed.

  The Winston-Salem Urban Area's and GUAMPO's LRTPs already integrate environmental justice plans with the environmental mitigation discussion. During their Federal certifications in Fall 2008, the MPOs received commendation for the environmental justice plans and the extensive analysis and mapping that was included in the LRTP process. One of the staff members responsible for developing the plan will serve on a Federal Transit Administration Roundtable on Social Equity in the Transportation Planning process and was told the Winston-Salem Urban Area and GUAMPO were 2 of 4 to receive this recognition from over 110 MPOs nationwide.

- **Be as specific as possible when describing the extent and scale of mitigation approaches**. Several of the Triad MPOs reported that it was difficult to ask for resource agency input on very general mitigation approaches that were not tied to current or proposed projects. One MPO noted that it can be difficult for some to react to "lines on a map" and that responses are more likely once people can react to specific project proposals.

- **Versatile products can meet a variety of needs**. Many of the Piedmont Triad MPOs stated that it is important to make a product that serves multiple purposes, such as a map that includes a variety of data layers and can be used by a large number of stakeholders. Products that are versatile and can meet different business needs can provide both time- and cost-savings to an agency. In addition, products that include too much—versus too little—information are still valuable. Identifying what information is incorrect is easier than identifying what information is missing.

- **Address fiscal planning for mitigation**. One of the Piedmont Triad MPOs indicated that the biggest change in its daily job duties as a result of Section 6001 was that mitigation, and wetland mitigation in particular, is now included in preparing project cost estimates. Previously, this MPO's financial plan for the LRTP did not account for potential costs of planned mitigation. Agencies should consider that accounting for mitigation might add time and cost to developing estimates for the LRTP financial plan.

Additional Resources

Burlington-Graham Transportation Plan 2000—2025 Update
www.mpo.burlington.nc.us/datanreports/main.htm

Greensboro Urban Area MPO 2035 LRTP. The MPO's Transportation Advisory Committee adopted GUAMPO's 2035 LRTP on January 28, 2009, and it is scheduled to remain in effect through September 2012. www.greensboro-nc.gov/departments/GDOT/divisions/planning/longrange/2035lrtp.htm.

High Point MPO 2035 LRTP. www.hpdot.net/HPMPO/plans/LRTP2035.html

Winston-Salem Urban Area 2035 LRTP and the Air Quality Conformity Analysis Report
www.cityofws.org/Home/Departments/Transportation/Planning/Articles/2035LongRangePlan

Case Study: San Diego Association of Governments

Overview

The San Diego Association of Governments (SANDAG) is the planning authority for the San Diego region, including 18 cities and the county government in the southern California region. In 2003, a state law consolidated SANDAG with two regional transit agencies, allowing SANDAG to assume responsibility for transit planning, funding projects, and construction, in addition to other transportation planning. The law assigned SANDAG the role of a regional transportation agency and planning authority. SANDAG currently works closely with the California Department of Transportation (Caltrans) to develop transportation plans and implement projects.

The San Diego region has a long history of undertaking significant environmental conservation efforts. In 1991, California implemented the Natural Community Conservation Planning (NCCP) Act.[59] The NCCP Act was created to develop a plan for open space and avoid future endangered species listings in California. The overall intent was to implement an ecosystem-based conservation strategy that provided long-term species protection while allowing for continued development. The Act was also designed to facilitate cooperation between the California Department of Fish and Game (DFG) and other government and local agencies to address potential development impacts on natural habitat. Overall, the NCCP Act moved the state to ward a regional conservation approach and away from a case-by-case species protection.

Pursuant to the NCCP Act, SANDAG developed several environmentally focused programs and documents that aligned with the state approach to conservation, as well as Section 6001 of SAFETEA-LU. Some examples are highlighted below:

- **Regional Comprehensive Plan and Regional Transportation Plan**. Starting in 2000, SANDAG began to consider ways to address many different factors—including housing, transportation, and the environment—in one plan. The regional comprehensive plan (RCP)[60] was developed in 2004 as an overarching, regional planning framework for the future. Because the regional transportation plan (RTP), *Mobility 2030* (approved in 2003), focused on transportation improvements, the RCP became a companion document that addressed issues not included in the RTP.

  The RCP provides more context and details for regional integration of transportation with land use. For example, the RCP includes a "Healthy Environment" chapter that identifies baseline data regarding natural habitats, water quality, shoreline preservation, and air quality. The purpose of creating an inventory of baseline data was to provide a benchmark against which progress toward meeting the RCP policy objectives could be assessed and compared. The RTP was amended in 2007.[61] The latest RTP for the region was approved in November 2007. The amended RTP is called *2030 San Diego RTP: Pathways for the Future*. In the future, SANDAG anticipates merging the RTP and RCP.

    - *Developing Companion Documents*. Making the documents complementary was not a decision made explicitly in response to Section 6001; rather, SANDAG

[59] The NCCP Act available is at: www.dfg.ca.gov/habcon/nccp/displaycode.htm.
[60] RCP available is at: www.sandag.org/index.asp?projectid=1&fuseaction=projects.detail.
[61] Amended RTP is available at: www.sandag.org/index.asp?projectid=292&fuseaction=projects.detail.

reported that this was a "common sense" decision. SANDAG also noted that making the documents companions was a key step toward developing a more robust regional strategy for mitigation, which complements the objectives set out in Section 6001 provisions.

- *Monitoring Results*. SANDAG developed an annual monitoring program for the RCP (based on a set of indicators) in order to evaluate the region's progress toward meeting the goals included in the document. For example, the 2007 Annual Performance Monitoring Report (APMR)[62] indicates that in 2006, approximately 60 percent of target open space areas had been preserved in SANDAG jurisdictions that had approved habitat conservation plans.[63]

SANDAG addressed the consultation requirements of Section 6001 through the *TransNet* EMP interagency and working group meetings as well as separate interagency meetings conducted to discuss specific transportation projects. SANDAG reported that the RCP has also been helpful in facilitating interagency discussion. The RCP serves as a reference for SANDAG when the agency interacts with developers, local government, and resource agencies. For example, the RCP provides a framework for considering certain regions as "smart growth villages." If a transportation project is slated for development in this type of area, SANDAG can look to the RCP to ensure that mitigation efforts are aligned with a regional vision for integrated land use and transportation as well as the local jurisdiction's land-use objectives.

- **NCCP Act Conservation Programs**. The NCCP Act is an umbrella for several conservation programs, including the Multiple Species Conservation Program (MSCP) (see Figure 14), which outlines a plan to protect and preserve sensitive plant and animal species and interconnected areas of native vegetation in San Diego County. The MSCP extends the state conservation approach (as outlined in the NCCP Act) by covering additional species. Numerous regional programs are included under the MSCP, including the South, East, and North County plans. The South County plan, covering southwestern San Diego, was approved in 1997. The North and East County plans are in development. From 1998 to 2007, the South County MSCP achieved 67 percent of its conservation goal with 65,214 acres of land conserved through acquisition, easement dedication, and preserve creation.[64] Additionally, several mitigation banks have been developed on the land acquired through the MSCP. The mitigation banks include approximately 443 acres of land, preserved to offset the potential impacts from road projects developed by the Department of Public Works.

[62] Available at www.sandag.org/uploads/publicationid/publicationid_1344_7682.pdf.
[63] APMR, p. 21.
[64] From the 2007 MSCP Annual Report. Available at www.sdcounty.ca.gov/dplu/mscp/docs/SCMSCP/2007AnnualReport.pdf.

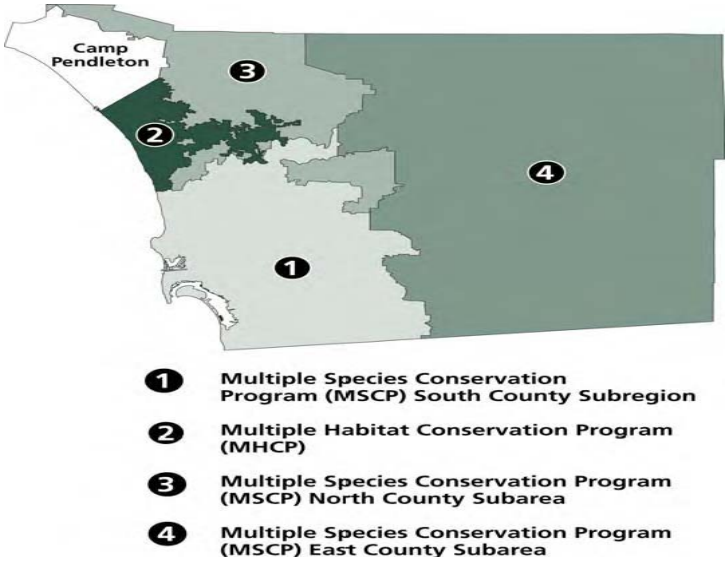


Figure 14. NCCP Act Conservation Programs in San Diego County

- ***TransNet* Environmental Mitigation Program**. *TransNet* is a half-cent sales tax that funds a variety of regional transportation improvements in the SANDAG region. In 2004, voters supported an extension of *TransNet* until 2048.

  As part of the *TransNet* extension, the Environmental Mitigation Program (EMP) was created to specifically allocate funds to protect, preserve, and restore native habitat that construction of transportation projects listed in SANDAG's RTP disturbed. EMP funds are used to purchase land at lower costs by acquiring land prior to project development to bank for future mitigation needs. Due to the savings from purchasing land early and in large parcels, the EMP provides significant economic benefit to the region. Maximizing early land acquisition, EMP is also designed to address mitigation requirements on a comprehensive and regional basis rather than on a project-by-project basis.

  A memorandum of agreement (MOA) was signed in March 2007 by SANDAG, Caltrans, the USFWS, and the California DFG specifying the terms for purchasing land for mitigation purposes. In January 2008, SANDAG made the first land purchase using *TransNet* EMP funds: 282 acres of land to mitigate construction for the future expansion of State Route 76 (SR 76). An additional 136 acres of wetland habitat near the San Luis Rey River was also obtained with EMP funds to mitigate for the same SR 76 project.

  - *Interagency Consultation*. To manage the *TransNe*t EMP, a working group was developed that meets monthly. Representatives from the City of San Diego, County of San Diego, the four SANDAG sub-regions, State and Federal wildlife agencies, and several additional organizations with an interest in EMP implementation comprise the working group. Interagency meetings are held among the core group of Caltrans, SANDAG, USFWS, and DFG to determine how to direct *TransNe*t dollars toward specific projects. Other agencies are brought into the mitigation discussion as appropriate.

Mitigation Approach

SANDAG had a robust framework in place to approach the requirements of Section 600, including a strong foundation created by RCP and *TransNe*t EMP, as well as the state's long

history with regional conservation efforts. Overall, Section 6001 matched, rather than motivated, SANDAG's ongoing efforts to conserve habitat and mitigate for project impacts.

To explicitly meet Section 6001's mitigation discussion requirements, SANDAG summarized the *TransNet* EMP program in Chapter 5 of *Pathways for the Future*, the San Diego RTP. Chapter 5 ("Land Use-Transportation Connection: We Must Grow Smarter") included an overview of the EMP and described the economic benefit generated by the program. SANDAG included only a brief summary of the EMP in the RTP because the RCP had already analyzed a regional growth strategy in detail. This regional growth strategy encompassed current and future land-use planning and management.

Additionally, SANDAG developed a land-use database in 2000 as part of a broader regional effort to better coordinate geospatial information. The land-use database included GIS-based inventories of open spaces, designated parks, and current and planned land use. Using this GIS data, SANDAG was able to identify open-space locations more easily and determine a preservation strategy to include in the RCP.

SANDAG reported that Section 6001 did reinforce the need for a cooperative, regional, ecosystem-based mitigation approach. Along with Section 6002, which seeks to streamline the environmental review process, Section 6001 has made it easier for SANDAG to participate earlier in the NEPA process. SANDAG reported that it is sometimes difficult to navigate the process given the number of permits required for development of certain projects. However, Section 6001 and 6002 have allowed SANDAG to be "in the room and at the table" during environmental review conversations.

Challenges

SANDAG reported several challenges related to their environmental mitigation approaches and efforts to develop the amended RTP and RCP.

- **Advanced mitigation**. Currently, a new state law to establish an advance mitigation approach to mitigation is being proposed in California. The bill would require advance mitigation plans to allow better anticipation of transportation project impacts and identify mitigation opportunities/needs before project approval and construction. SANDAG noted that while they support a proactive approach to identifying and securing mitigation opportunities, there are concerns that this approach would not ensure predictability during the regulatory permitting process for future transportation projects. It might be important to establish a monitoring system to ensure that mitigation activities identified early on in project planning are carried out in later stages of project development.

- **Mitigation at regional level**. SANDAG noted that there has not been agreement among resource agencies in California about how mitigation should occur. Some agencies have focused on project-by-project mitigation while others have focused on more holistic, regional mitigation approaches. In order to identify and establish effective mitigation strategies, it will be important to establish agreement on the best scale for carrying out these activities.

- **Ongoing monitoring and assessment of results**. Circumstances have made it difficult for SANDAG to conduct ongoing monitoring of species conservation to evaluate progress made toward RCP objectives. For example, two major wildfires occurred in the San Diego

Lessons Learned

Lessons learned that SANDAG reported include:

- **Justify a systems-level perspective**. SANDAG occupies a unique position as an MPO that functions as a regional planning authority. This position provides the agency with increased authority, allowing it to develop and implement a broader perspective when identifying the area's natural resource mitigation needs and opportunities, as well as coordinating interagency consultation processes.

  As such, SANDAG reported that the significance of Section 6001 was to provide a first step to thinking about streamlined project planning. SANDAG had mitigation/interagency coordination approaches in place prior to SAFETEA-LU. However, SANDAG considered the legislation to be a reinforcement of SANDAG's own systems-level perspective on regional environmental issues. This reinforcement facilitated SANDAG's conservation efforts, communication with resource agencies, and RCP performance evaluation. The agency anticipates that SAFETEA-LU Section 6002, which seeks to streamline the environmental review process, will be a crucial second step to guide project implementation.

- **Use existing frameworks to develop a strategic mitigation approach**. Whenever possible, agencies should consider using existing frameworks (such as the RCP and RTP, in SANDAG's case) as guides for developing future mitigation approaches. However, agencies should consider that mitigation cannot be prescriptive: a "one size fits all" approach to addressing the tenets of Section 6001 will not work because every MPO and region is different.

- **LRTPs should not be the only place where mitigation is described or considered in planning**. SANDAG's robust mitigation approach is not fully reflected in its LRTP (i.e., the plan only briefly discusses SANDAG's mitigation efforts in the context of the *TransNet* EMP). The RCP provides additional detail on the SANDAG systems-level environmental perspective and should be considered in conjunction with the regional transportation plan. Companion documents, such as the RCP, could be developed if an agency believes that these documents offer better opportunities to discuss mitigation approaches. Given that the LRTP might not fully describe all the efforts that have taken place, there is some question as to whether the LRTP the 'best' or most 'appropriate' place to address regional mitigation approaches.

- **Evaluate over time whether considering mitigation in planning leads to streamlined permitting**. At the writing of this case study, SANDAG believed that it was "too early to tell" whether mitigation requirements in Section 6001 had led to a more integrated approach to transportation planning or had streamlined project permitting or development. However, in the long term, SANDAG believes that interagency consultation accomplished as part of the *TransNet* EMP and RTP/RCP development will likely facilitate streamlining.

Additional Resources

NCCP Act: www.dfg.ca.gov/habcon/nccp/displaycode.htm

SANDAG's RCP: www.sandag.org/index.asp?projectid=1&fuseaction=projects.detail

SANDAG's amended RTP: www.sandag.org/index.asp?projectid=292&fuseaction=projects.detail

2007 MSCP Annual Report: www.sdcounty.ca.gov/dplu/mscp/docs/SCMSCP/2007AnnualReport.pdf

APPENDIX A. CASE STUDY CONTACTS

Baltimore Regional Transportation Board	Jody McCullough, BRTB Sara Tomlinson, BRTB Mary Barse, MSHD Heather Lowe, MSHD
Capital District Transportation Committee	Anne Benware Theresa Lasalle
Illinois Department of Transportation	Keith Sherman Barbara Stevens
Maricopa Association of Governments	Roger Herzog
Mid-Ohio Regional Planning Commission	Chester Jourdan Amy Lowe
Minnesota DOT	Frank Pafko
Montana Transportation Department	Bonnie Gundrum Tom Martin Lynn Zanto
Piedmont Triad MPOs	Bob Harkrader, Burlington-Graham MPO Lydia McIntyre, Greensboro Urban Area MPO David Hyder, High-Point MPO Scott Rhine, Piedmont Area Regional Transportation Margaret Bessette, Winston-Salem DOT Greg Errett, Winston-Salem DOT Kevin Edwards, Winston-Salem DOT Lakesha Dunbar, Winston-Salem DOT Wendy Miller, Winston-Salem DOT
San Diego Association of Governments	Keith Greer

APPENDIX B. DISCUSSION GUIDE

Environmental Mitigation in Plan

Was environmental mitigation (including avoidance and minimization) discussed in transportation plans or planning studies prior to Section 6001?

- If so, can you provide examples?
- If not, was it considered/documented in any other way?

When SAFETEA-LU was issued, how did you define/interpret the terminology in Section 6001 to include a "discussion of environmental mitigation?"

- Was there any confusion as to what language/type of discussion to include?

How have the new provisions changed the way environmental mitigation is planned?

- In which phase of transportation planning process do you start to think/plan for environmental mitigation activities?
    - Is the discussion always linked to specific projects? Are mitigation activities in your area project-specific, or corridor-specific? Is the process the same?
- Has the new process changed the way mitigation is implemented when there are actual projects?
    - Does this affect what projects are in the STIP and TIP? Do you know how (or whether) environmental mitigation gets incorporated in the statewide plan?
- How are avoidance and minimization considered in planning? How do they factor in the planning process, and how are they documented?
- Is there consideration of how the mitigation outcomes/activities will be monitored or managed?

Environmental Resources and Interagency Coordination

How do you identify sensitive environmental sites/areas/resources or types of resources that the plan potentially affects?

- How and by whom are ecological values determined?
- Are potential or specific mitigation locations/populations identified in the plan?
- Do you use mitigation banking or credits (or other third-party mitigation such as in-lieu fee programs)? Describe the process of deciding on a particular mitigation strategy/method for a given project/natural resource/impact (methods include preservation, restoration, establishment or enhancement?). In the plan, are different strategies considered for different natural resources (e.g., wetlands vs. endangered species)?
- Are cumulative impacts considered, and if so, how?

How do you prioritize the activities that will have the greatest potential to restore and maintain the environmental functions affected by the plan?

To what extent is the public involved in planning for environmental mitigation? At which phase is it involved? Is the involvement process documented?

To what extent are other agencies involved in planning for environmental mitigation? Typically, who (which the stakeholder agencies) are involved in the process? Who is responsible for/who usually initiates the discussion? Does their involvement lead to streamlined permitting once a project is being constructed?

- How is the consultation process documented?
- Has the involvement from other agencies in the planning process informed decisions during the NEPA process? How are they kept engaged in the process?

Has your state ever encountered a project or mitigation area that required coordination across state/regional boundaries?

What challenges have you encountered in developing environmental mitigation plans or working with others to identify areas of potential environmental mitigation? What would have helped?

Tools and Technology

How has technology (e.g., GIS) been used for evaluating mitigation options in planning? Who is involved? Were there challenges in getting this off-the-ground / continuing it?

What processes are put in place to support data-sharing, etc.? How do stakeholder agencies coordinate data sharing?

Lessons Learned

Identify any lessons learned from your experience with addressing Section 6001 or planning potential environmental mitigation. Could you provide some advice or "dos" and "don'ts?"

How do you think that your practice to incorporate environmental mitigation relates to others in the state/nationwide? Are you aware of best practice examples from other areas/states? If so, what appeals to you about that/their approach? How would you assess your activities?

Future

Given that you are now including a mitigation discussion in planning, what policy effects do you anticipate Section 6001 will precipitate? Will additional process changes be required?

When is your next LRTP update planned? Do you foresee changes to the environmental mitigation discussion?

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ADDITIONAL RESOURCES

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