

# Surface Transportation Environment and Planning Cooperative Research Program (STEP)

## Fiscal Year 2008 (FY08) Annual Report

### Executive Summary

Since 2006, the Federal Highway Administration (FHWA) has administered the Surface Transportation Environment and Planning Cooperative Research Program (STEP) to encourage new, strategic, and applied research on the relationship between surface transportation planning and the environment. Federal, State, and other stakeholders are involved throughout the STEP process to shape, refine, and implement research agendas.

#### Funding

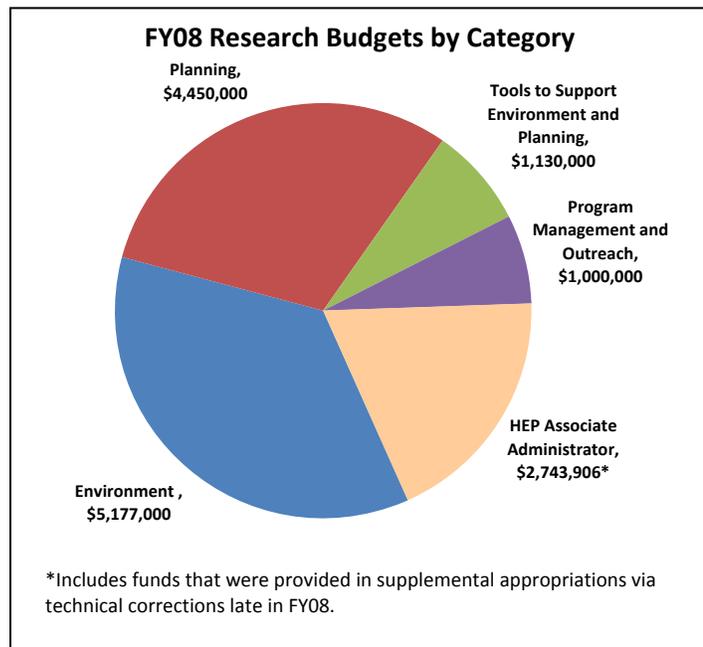
Section 5207 of the Safe, Accountable, Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) established the STEP program for 2006-2009. SAFETEA-LU authorized \$16.875 million annually to implement the STEP. After adjusting for obligation limitations, rescissions, and the over-designation of Title V Research in SAFETEA-LU, \$14.5 million was available for FY08 STEP.

#### FY08 STEP Accomplishments

- ✦ FHWA improved the state of the practice in planning, environment, and realty through investment in 52 projects identified in the FY08 STEP Plan that fall into three broad research categories: environment, planning, and tools to support environment and planning.
- ✦ STEP continued to be a model for stakeholder collaboration, outreach, and feedback. Using a web-based system, stakeholders provided nearly 300 pieces of feedback on research needs during the FY08 comment period between June 25 and August 24, 2007. Stakeholders also directly participated in prioritizing research needs through meetings and study reviews.
- ✦ FHWA addressed questions and concerns about how climate change impacts transportation.
- ✦ FHWA enhanced transportation demand management through improvements in travel modeling tools and geographic information systems.
- ✦ FHWA built professional capacity in planning and environment through outreach, training, and tools.

#### Impacts

- ✦ The STEP process has allowed FHWA to build partnerships that encourage collaboration, leverage diverse funding sources, and offer a fresh perspective on emerging research topics.
- ✦ Through the STEP, stakeholders have engaged in the development and implementation of projects, exchanged information on initiatives, and shared lessons learned about research findings and effective practices.



*STEP is the **sole source** of SAFETEA-LU funding for FHWA research on planning and the environment.*

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# Surface Transportation Environment and Planning Cooperative Research Program (STEP)

## Conducting Research that Links to Practice

Since 2006, the Federal Highway Administration (FHWA) has administered the Surface Transportation Environment and Planning Cooperative Research Program (STEP) to encourage new, strategic and applied research on the relationship between surface transportation planning and the environment. Federal, State, and other stakeholders are involved throughout the STEP process to shape, refine, and implement research agendas.

This publication provides an overview of the STEP program’s accomplishments during Fiscal Year 2008 (FY08). Detailed information about outreach activities and specific research projects can be found in the appendices.

### Linking Research to Practice

The STEP funding allows researchers to carry out timely investigations and analyses, translate and synthesize research from other initiatives into practice, and fund quick turn-around efforts that advance key strategies to address national priorities.

STEP funds support projects with three different, but interrelated functions:

- **Conducting Research Studies** – Several projects collect and analyze scientific or technical data about species and habitat, construction materials, travel patterns, and other topics. Researchers in academia, at State DOTs, or in other State agencies carry out this work to create a foundation for applied projects that implement findings and new practices.
- **Developing and Deploying Tools, Technologies and Practices** – Many projects build on the technical and scientific foundation established by STEP-funded projects. These activities translate research findings into action through the establishment of demonstration and pilot programs, the documentation of best practices, and other activities.
- **Connecting the Community and Transferring Knowledge** – Other projects facilitate dialogue and links among transportation professionals. National associations and Federal, State, and local agencies host peer exchanges, summits, conferences, and similar events. They also develop training materials, build websites, and partner with stakeholders to share critical information.

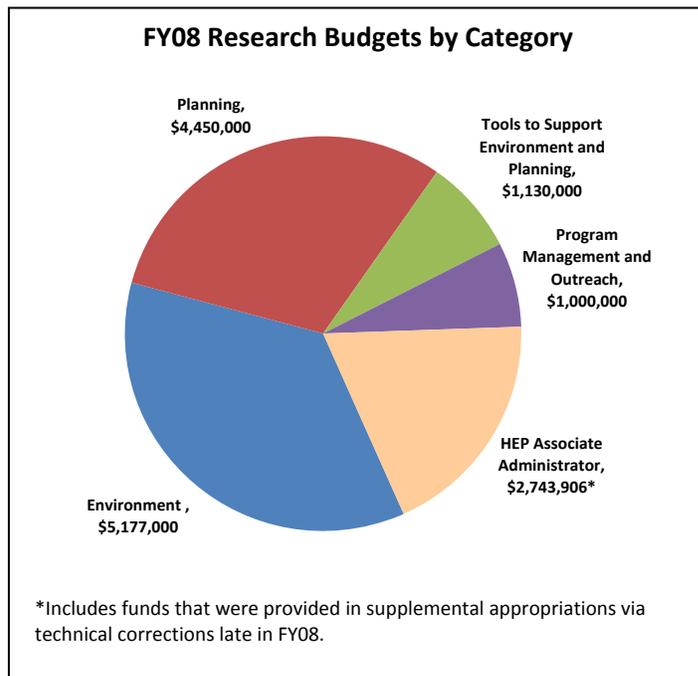
### STEP’s Legislative History

Section 5207 of the Safe, Accountable, Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) established the STEP program for 2006-2009. Congress mandated a 50 percent non-Federal match to encourage collaboration with partners and increase the scope of research that can be undertaken. In cases where projects are funded through a competitive bid process, the requirement may be waived.

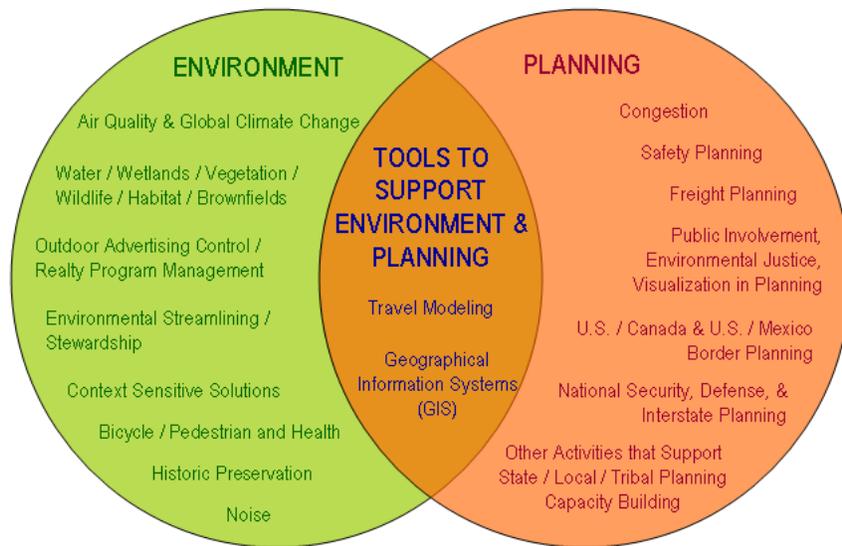
### Efficient Management of a Successful Program

SAFETEA-LU authorized \$16.875 million annually to implement the STEP. After adjusting for obligation limitations, rescissions and the over-designation of Title V Research in SAFETEA-LU, \$14.5 million was available for FY08 STEP.

Through STEP, FHWA invests in projects in each of 17 “emphasis areas” that fall into three broad research categories: environment, planning, and tools to support environment and planning. The 52 projects funded in FY08 enhance the state of the art and practice in planning, environment, and realty.



**STEP EMPHASIS AREAS**



**Highlights of FY08 STEP Research**

STEP projects include short-term initiatives and ongoing multi-year programs; they may be carried out by FHWA staff, or by a collection of professionals in many different agencies. The FHWA uses STEP funds and the STEP process to build partnerships that encourage collaboration, leverage diverse funding sources, and offer a fresh perspective on emerging research topics. Stakeholders engage in the development and implementation of projects, exchange information on their initiatives, and share lessons learned about research findings and effective practices.

Notable projects from each emphasis area are highlighted below with respect to their core function:

**Conducting Research Studies**

- Analyzed and developed improved **travel modeling** methods to forecast nationwide vehicle miles traveled estimates based on economic and demographic factors.
- Synthesized research on the **effects of deicing materials** on human health, aquatic life, surface water and groundwater quality.
- Analyzed economic impacts of travel time at **border points of entry**, and also evaluated cross-border travel to improve travel demand models.
- Evaluated the impact of investing in bicycling and walking infrastructure and programs on travel behavior, energy consumption, physical activity, and environmental quality as part of the **Nonmotorized Transportation Pilot Program**.

**Developing and Deploying Tools, Technologies and Practices**

- Established a pilot program to demonstrate how State DOTs could design right-of-way projects to **sequester carbon** and sell the credits, thereby generating revenue while improving the environment.
- Improved state-of-the-art **highway traffic noise** prediction and noise barrier design model based on input from the user community.
- Developed guidance on **congestion management processes** in Transportation Management Associations to support integration of operations in transportation planning.

- Piloted a **Strategic Highway Safety Plan** process to help States identify safety needs and make investment decisions to achieve significant reductions in highway fatalities and serious injuries on public roads.
- Developed tools and provided technical assistance to State and local agencies to create more **effective public involvement** in transportation decision-making.
- Improved **National Highway System** network data and maps.
- Developed the **Competency Navigator**, an online tool for assessing environmental competencies and providing links to professional development tools and resources.

### Connecting the Community and Transferring Knowledge

- Facilitated national meetings for practitioners who implement the Uniform Act and **Outdoor Advertising Control** programs.
- Documented and shared business models for implementing **geospatial technologies** that are being employed at 42 State DOTs.
- Collaborated with the Advisory Council on Historic Preservation (ACHP) to engage transportation planning professionals in discussions on **integrating historic resources in planning**.
- Developed a resource manual, hosted peer exchanges, and identified performance measures to build capacity between the public and private sectors in **freight planning**.
- Promoted effective statewide, metropolitan, rural and tribal transportation planning practices through nationwide **Transportation Planning Capacity Building Program** events.
- Shared effective professional practices related to **Context Sensitive Solutions**, including performance measures, policies, and procedures from around the country.

### Stakeholder Collaboration

In FY08, FHWA collaborated with Federal and State partners, representatives of national associations, members of the academic community, private sector professionals, and individual citizens. Together they assessed research needs, identified potential funding sources, and designed appropriate research plans and activities.

Hundreds of individuals were reached through meetings, teleconferences, and other events. For the past three fiscal years, FHWA has collected stakeholder feedback through a web-based system. Stakeholders can target their feedback towards one of the 17 emphasis areas or submit general comments. FHWA staff representatives for each emphasis area consult the stakeholder feedback to coordinate and develop the annual STEP research plan, which lists research priorities for the coming year and corresponding funding amounts. FHWA received nearly 300 pieces of feedback in FY08 from the web-based system.

The feedback system captures information about:

- Suggestions on the lines of research that should be pursued;
- Other current or planned research projects;
- Potential funding sources for research suggestions; and
- General comments about the STEP program.

*“Thank you for  
seeking input  
from  
researchers.”*

*-- STEP Stakeholder*

Stakeholders are also directly involved in prioritizing research needs during Transportation Research Board committee meetings, or by commenting on the progress of research studies. Thus, FHWA ensures that feedback informs technical research, findings are applied and implemented, and the transportation community is connected, informed, and successful.

### **Outreach to STEP Stakeholders**

Stakeholder outreach, feedback, and participation in research efforts are critical to successful implementation of the STEP. In order to ensure that STEP stakeholders had access to current and helpful information about the program, STEP team members—including emphasis area contacts, program managers, and research coordinators—attended meetings, teleconferences, and events to share STEP information.

STEP emphasis area contacts also engaged in outbound communications by phone and email to encourage stakeholders to use the web-based feedback system. The purpose of this type of outreach was to underscore the importance of submitting feedback and research suggestions through the online feedback mechanism during the FY08 comment period (June 25 through August 24, 2007).

Overall, the STEP program was represented at many events, teleconferences, in email lists, on websites, and in publications between October 2007 and September 2008, and information reached hundreds of stakeholders. This section includes a summary of outreach activities undertaken by FHWA staff on behalf of the STEP. Outreach generally took place in the following formats:

- Participation in events, conferences, symposia, webcasts/webinars, or meetings (including group events);
- Telephone calls (including conference calls and individual conversations);
- Email (including group or listserv emails and stakeholder messages);
- Publications (including newsletters);
- Other types of outreach (such as awards programs and peer exchanges).

A description of outreach efforts for each broad research category follows below.

#### **Environment**

Outreach took place between October 2007 and September 2008, and centered on telephone and email contact, attendance at events, meetings, workshops, and conferences, and delivery of information through various publications and websites. These activities reached Federal agencies, State DOTs, MPOs, the academic community, non-profit environmental organizations, and members of the environmental and engineering consulting community (all tiers).

Meetings and conference participation included summer and annual TRB meetings and other events, such as the “Northern Transportation and Air Quality Summit” (Baltimore, MD), the “Public Real Estate Symposium” (Dallas, TX), the Kentucky Air Quality Roundtable, and the annual conference of the National Alliance of Highway Beautification Agencies (Kalispell, MT). The 2008 Excellence in Right-of-Way (ROW) Awards program also served as an opportunity for stakeholder outreach.

The purpose of these in-person meetings and conference presentations was to describe the STEP program in general and the expected funding levels in various emphasis areas, discuss potential research activities, and encourage stakeholders to submit feedback through the online feedback mechanism. Additionally, some emphasis area contacts used these opportunities to share the proposed timeline of STEP research and activities and coordinate various research initiatives.

Telephone outreach primarily centered on one-on-one calls. These efforts primarily connected FHWA staff with representatives from staff at other Federal partner agencies. Email and website outreach connected FHWA staff with representatives from State DOTs, MPOs, researchers, and other stakeholder groups. Email outreach included messages disseminated through stakeholder group list serves on a regular basis.

STEP information was published in FHWA’s online monthly publication “Transportation Conformity Highlights,” which is widely distributed to all transportation and air quality agencies. Emphasis area contacts provided STEP information through websites, such as the AASHTO Center for Environmental

Excellence, Transportation Environmental Research Ideas Database. STEP information was also published in the FHWA Office of Real Estate Services' newsletter. .

### **Planning**

Outreach took place via in-person meetings, conference participation, webinars, direct interaction with partner associations and stakeholder groups, telephone, and email outreach.

Meeting, conference, and webinar participation included various TRB committee meetings, meetings with national associations such as the Association of Metropolitan Planning Organizations (AMPO) and AASHTO, the Headquarters' Biennial Planner's Meeting (Washington, D.C.), the Indiana Congestion Conference (Indianapolis, IN), two "Let's Talk Planning" sessions conducted as webinars, and several other webinar events.

Stakeholder outreach was also accomplished through written materials such as memoranda to MPO and state DOT contacts.

Ongoing telephone and email outreach connected FHWA staff with stakeholders. Website outreach, such as postings on the FHWA Plan4Operations website, also solicited stakeholder comments on research initiatives.

Finally, FHWA received feedback via telephone and email on the draft Interim Congestion Management Process and Management & Operations Guidebooks, which were vetted through AMPO's operations subcommittee for review and comment. Feedback from this process then provided input finalizing the documents.

### **Tools to Support Planning and Environment**

Outreach took place via in-person meetings, peer exchanges, webcast and conference participation, and emails.

Participation in meetings (including peer exchanges and webinars) and conferences (such as AASHTO's GIS-T Symposium in Houston, TX, and the Transportation for the Nation workshop in Washington, D.C.) reached Federal agencies, State DOTs, MPOs, and members of the research/academic community. These meetings and conference presentations provided a forum to discuss potential research ideas and priorities. Additional outreach was accomplished through the "Improving National Transportation Geospatial Information" workshop in Washington, D.C.

Email outreach connected FHWA staff with stakeholders who were part of the Yahoo! GIS in Transportation group list serv. These email messages introduced the STEP program and encouraged stakeholders to submit their feedback through the online feedback mechanism. Other web-based outreach took place, such as postings to the FHWA GIS in Transportation website.

### **General STEP Outreach**

Program managers and STEP program support staff undertook outreach via in-person meetings. Four discussion sessions were convened to coordinate STEP research with the National Cooperative Highway Research Program, the Future Strategic Highway Research Program, and other research initiatives. The purpose of these discussions was to ensure that there was no duplication of research efforts.

## Appendix A

### Overview of STEP Program

#### DEFINITION OF STEP

Section 5207, Surface Transportation Environment and Planning (STEP) Cooperative Research Program, of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) established a new cooperative research program for environment and planning research in Section 507 of Title 23, United States Code, Highways (23 U.S.C. 507). The general objective of the STEP is to improve understanding of the complex relationship between surface transportation planning and the environment.

#### FY2008 REPORT

The purpose of this report is to provide an overview of the Federal Highway Administration (FHWA) STEP program accomplishments, stakeholder outreach and feedback, and STEP research activities for Fiscal Year (FY) 2008. The report includes an overview of the STEP program and lessons learned in STEP implementation.

#### STEP FUNDING

SAFETEA-LU authorized \$16.875 million per year for FY2006-FY2009 to implement this new program. However, due to obligation limitations, rescissions and the over-designation of Title V Research in SAFETEA-LU, \$12.416 million of the \$16.875 million authorized was available in FY2008. <http://www.fhwa.dot.gov/hep/step/strategy.htm> - [ftn1#ftn1](#) STEP is the sole source of funds to conduct all FHWA research on planning and environmental issues. In addition, Congress mandated several special studies and STEP will be the funding source for those projects. STEP will also address priorities identified in the U.S. Department of Transportation (USDOT) Research and Development Strategic Plan (Section 508 of Title 23 U.S.C.). STEP funding, even in combination with other SAFETEA-LU research funding sources, is less than what was available to the FHWA in prior years for planning and environmental research. This means FHWA will have to make difficult choices among the many competing needs for planning and environmental research, and will not be able to fund all worthy research.

Congress mandated that the Federal share be 50% for research funded under Title V of SAFETEA-LU, including STEP. While this will not apply to contract funding, it will apply to STEP research funded through cooperative agreements and grants.

Section 507 of Title 23 U.S.C. identifies certain characteristics of STEP regarding program content and administration. Regarding the program content, STEP may include research to:

- Develop more accurate models for evaluating transportation control measures and system designs for use by State and local governments to meet environmental requirements;
- Improve understanding of transportation demand factors;
- Develop indicators of economic, social, and environmental performance of transportation systems to facilitate alternatives analysis;

- Meet additional priorities determined through the transportation research and development strategic planning process identified in 23 U.S.C. 508; and
- Refine the scope and research emphases through outreach and in consultation with stakeholders.

In administering the program, USDOT and FHWA must ensure, to the maximum extent practicable, that:

- The best projects and researchers are selected based on merit, open solicitations, and selection by a panel of appropriate experts;
- Qualified, permanent core staff with ability to manage a large multiyear budget is used;
- Stakeholders are involved in governance of program; and
- There is no duplication with the Future Strategic Highway Research Program (SHRP II) (23 U.S.C. 510), which will be administered by the National Research Council of the National Academy of Sciences.

In FY2008, the STEP program was implemented along the following timeline:

<b>December</b>	Post current fiscal year plan on STEP Website.
<b>Winter</b>	Begin to implement current fiscal year plan, through appropriate procurement methods, agreements and partnerships. (This milestone may shift depending on appropriations).
<b>Spring</b>	Refine STEP Implementation Strategy/Goals/Emphasis Areas; publish Federal Register Notice and update website information to solicit feedback on next fiscal year STEP activities. Conduct outreach for next fiscal year by emphasis area, review research needs, and identify gaps.
<b>Spring/Summer</b>	Develop priorities for and fund critical, short-term research. Develop Draft next fiscal year STEP Plan for comment.
<b>Fall/Winter</b>	Post current fiscal year plan on STEP website. (This milestone may shift depending on appropriations).

## EMPHASIS AREAS

In order to efficiently and effectively administer the program, seventeen emphasis areas were identified under the four broad program categories of environment, planning, tools to support environment and planning, and program management and outreach. Emphasis area contacts carried out individual outreach activities, while the STEP Program Manager and support team compiled and managed incoming stakeholder feedback, provided guidance on communication with stakeholders, and oversaw the development of the research plan.

The table below displays the seventeen emphasis areas organized within program themes as well as a list of FHWA emphasis area contacts.

<b>1. Environment</b>	
Air Quality and Global Climate Change	<a href="mailto:Cecilia.Ho@dot.gov">Cecilia.Ho@dot.gov</a>
Water/Wetlands/Vegetation/Wildlife/Habitat/Brownfields	<a href="mailto:Carol.Adkins@dot.gov">Carol.Adkins@dot.gov</a>
Historic Preservation	<a href="mailto:MaryAnn.Naber@dot.gov">MaryAnn.Naber@dot.gov</a>
Bicycle/Pedestrian and Health	<a href="mailto:Gabe.Rousseau@dot.gov">Gabe.Rousseau@dot.gov</a>
Noise	<a href="mailto:Mark.Ferroni@dot.gov">Mark.Ferroni@dot.gov</a>
Outdoor Advertising Control/Realty Program Management	<a href="mailto:Carolyn.James@dot.gov">Carolyn.James@dot.gov</a>
Environmental Streamlining/Stewardship	<a href="mailto:Shari.Schaftlein@dot.gov">Shari.Schaftlein@dot.gov</a>
Context Sensitive Solutions	<a href="mailto:Shari.Schaftlein@dot.gov">Shari.Schaftlein@dot.gov</a>
<b>2. Planning</b>	
Congestion	<a href="mailto:Harlan.Miller@dot.gov">Harlan.Miller@dot.gov</a>
Safety Planning	<a href="mailto:Lorrie.Lau@dot.gov">Lorrie.Lau@dot.gov</a>
Freight Planning	<a href="mailto:Spencer.Stevens@dot.gov">Spencer.Stevens@dot.gov</a>
Public Involvement, EJ, Visualization in Planning	<a href="mailto:Brenda.Kragh@dot.gov">Brenda.Kragh@dot.gov</a>
Other Activities that Support State/Local/Tribal Planning Capacity Building	<a href="mailto:Robert.Ritter@dot.gov">Robert.Ritter@dot.gov</a>
US/Canada and US/Mexico Border Planning	<a href="mailto:Roger.Petzold@dot.gov">Roger.Petzold@dot.gov</a>
National Security, Defense, and Interstate Planning	<a href="mailto:Stefan.Natzke@dot.gov">Stefan.Natzke@dot.gov</a>
<b>3. Tools To Support Planning and Environment</b>	
Travel Modeling	<a href="mailto:Fred.Ducca@dot.gov">Fred.Ducca@dot.gov</a>
GIS/Spatial Information for Improved Decision Making	<a href="mailto:Roger.Petzold@dot.gov">Roger.Petzold@dot.gov</a>
<b>4. Program Management and Outreach</b>	<a href="mailto:Felicia.Young@dot.gov">Felicia.Young@dot.gov</a>

## TIERS OF STAKEHOLDERS

As described in the STEP Implementation Strategy, the number of stakeholders with an interest in environment and planning research is enormous and diverse. Stakeholders have been categorized according to the following three tiers:

**Tier I - Federal Agencies and Tribes:** Tier I stakeholders may include agencies like the Departments of Commerce, Defense, Homeland Security, Agriculture, Energy, Interior (DOI) and Housing and Urban Development (HUD), the Environmental Protection Agency (EPA), and the Centers for Disease Control

and Prevention (CDC). Within each of these agencies, there are many discrete organizations and programs with an interest in STEP - e.g., National Park Service, U.S. Fish and Wildlife Service and Bureau of Land Management within the DOI. Within the US Department of Transportation (USDOT), FHWA partners with the Federal Transit Administration (FTA) on virtually all planning and environmental work, including research. FHWA also coordinates with the Federal Railroad, Aviation, Research and Innovative Technology, and Maritime Administrations, and with the Office of the Secretary of Transportation on Global Climate Change as well as other issues. There are over 500 federally recognized Native American Tribes, which have a major interest in research affecting their planning and environmental needs.

**Tier II - State and Local Government:** State Departments of Transportation (State DOTs) and Metropolitan Planning Organizations (MPOs) have a major interest in environment and planning research, as the research affects national policy and can also provide important tools, information, and training to meet day-to-day needs of these agencies. In addition, local government units (including transit operators as well as county public works departments and city transportation departments) depend on national environmental and planning research. State/local environmental and natural resource agencies and State Historic Preservation Officers have a strong interest in planning and environmental research. There is also a growing interest by state/local health agencies in transportation planning and environmental research as it relates to health impacts of the surface transportation system.

**Tier III - Nongovernmental Transportation and Environmental Stakeholders:** Within the transportation and environment sectors, there are hundreds and perhaps thousands of nongovernmental stakeholders, such as the American Automobile Association, American Road and Transportation Builders Association, American Highway Users Alliance, Surface Transportation Policy Project, Defenders of Wildlife, American Association of Retired Persons (AARP), Sierra Club, Conservation Law Foundation, American Council of Engineering Companies, American Planning Association, League of American Bicyclists, National Trust for Historic Preservation, International Right of Way Association, National Alliance of Highway Beautification Agencies and others too numerous to specify here.

Appendix B provides a narrative summary of outreach activities conducted for each of the four broad program areas: Environment, Planning, Tools to Support Planning and Environment, and Program Management and Outreach. Each outreach summary includes information about which tier(s) of stakeholders were contacted or reached by various outreach activities.

## Appendix B Research Highlights

STEP funds contributed to substantial advancements in research and tools to support transportation planning and the environment. In addition, STEP research projects have leveraged funds from other sources to complete this work. Several emphasis areas were involved in successful cost-sharing partnerships; in particular, the US/Canada and US/Mexico Border Planning emphasis area supported much of its research with pooled-fund studies.

<b>Emphasis Area</b>	<b>Number of Research Recommendations</b>	<b>FY 2008 STEP Budget</b>
<b>ENVIRONMENT EMPHASIS AREAS</b>		
Air Quality and Global Climate Change	4	\$1,148,500
Water Wetlands, Vegetation, Wildlife, Habitat, Brownfields	8	\$1,070,000
Historic Preservation	2	\$225,000
Bicycle/Pedestrian and Health	1	\$70,000
Noise	1	\$200,000
Outdoor Advertising Control/Realty Program Management	4	\$300,000
Environmental Streamlining/Stewardship	5	\$1,663,500
Context Sensitive Solutions	2	\$500,000
<b>PLANNING EMPHASIS AREAS</b>		
US/Canada and US/Mexico Border Planning	2	\$400,000
National Security, Defense and Interstate Planning	3	\$300,000
Congestion	1	\$750,000
Safety Planning	1	\$100,000
Freight Planning	1	\$100,000
Public Involvement, EJ, Visualization in Planning	1	\$375,000
Other Activities that Support State/Local/Tribal Planning Capacity Building	9	\$2,425,000
<b>TOOLS TO SUPPORT PLANNING AND ENVIRONMENT EMPHASIS AREAS</b>		
GIS/Spatial Information for Improved Decision Making	6	\$400,000
Travel Modeling	1	\$730,000
<b>PROGRAM MANAGEMENT AND OUTREACH</b>	3	\$1,000,000
<b>HEP ASSOCIATE ADMINISTRATOR</b>		\$2,743,906
<b>TOTAL</b>	<b>55</b>	<b>\$14,500,906</b>

STEP emphasis area contacts and program staff identified research activities for FY2008 based on input from stakeholders and FHWA priorities. Complete descriptions of each research activity recommended in FY08 can be found on the STEP Website at <http://www.fhwa.dot.gov/hep/step/fy08rp.htm>.

Descriptions of FY2008 research activities by emphasis area, including activities funded with FY2006, FY2007, or FY2008 funds, are listed below. These descriptions include accomplishments from both short-term and ongoing projects. The total budget for an emphasis area may not equal the sum of individual projects described in this report, as some accomplishments occurred in FY09, or priorities may have shifted following development of the research plan.

## Emphasis Areas Related to Environment

### Air Quality and Global Climate Change

**Emphasis Area Contacts:** Cecilia Ho  
**Level of FY2008 Funding:** \$1,148,500

The Air Quality and Global Climate Change emphasis area supported substantial research and steps to improve outreach in response to stakeholder comments. Projects underway or completed include:

- **Climate Change: Local Mitigation and Impacts. (FY2008: \$398,500).** One rapidly growing area of FHWA research is climate change and how to mitigate its effects. This project involves sponsorship of a pilot program with the New Mexico DOT to determine how much carbon dioxide can be captured in plants and soils along highway ROW. The process, which is known as biological carbon sequestration, can reduce greenhouse gases already in the atmosphere. A commodity market already exists for carbon credits. If this project is successful, State DOTs could design ROW management projects to sequester carbon and sell the credits, thereby generating revenue while improving the environment.
- **Air Quality and Global Climate Change Research Outreach and Communication. (FY2008: \$200,000).** Several conferences and one workshop were held to provide opportunities for stakeholders to discuss a variety of air quality-related topics. These outreach efforts included:
  - **The Northern Transportation and Air Quality Summit (NTAQS).** The NTAQS brought nearly 130 air quality and transportation professionals and stakeholders together to discuss the current and upcoming regulatory environment, new technologies, and current practices. The conference began with a basic orientation on the Motor Vehicle Emission Simulator (MOVES), the EPA's latest air quality modeling software led by FHWA and EPA staff. Please visit: [www.marama.org/ntaqs/](http://www.marama.org/ntaqs/)
  - **Kentucky's Regional Air Quality Conference.** The FHWA's Kentucky Division Office and the Kentucky Transportation Cabinet co-hosted the fourth biennial Regional Air Quality Conference. Several FHWA headquarters and Division air quality staff participated as speakers or organizers. The conference showcased new technology and addressed FHWA and EPA policy, climate change, new fine particle (PM2.5) and ozone standards, hot spot analysis, and electric vehicles. This year's conference also included

presentations on National Environmental Policy Act (NEPA) and project level conformity. Please visit:

[http://www.planning.kytc.ky.gov/modal\\_programs/air\\_quality\\_files/2008AirQualityConference/PARTICIPANT%20HANDBOOK.pdf](http://www.planning.kytc.ky.gov/modal_programs/air_quality_files/2008AirQualityConference/PARTICIPANT%20HANDBOOK.pdf)

- **The Transportation Research Board (TRB) 11th National Tools of the Trade Conference on Transportation Planning for Small and Medium-sized Communities** was held in Portland, OR. The conference was dedicated to transportation planning for small and medium-sized communities. Transportation planners, engineers and others gathered to present their latest information on topics of mutual interest. FHWA sponsored an air quality workshop hosted by the Resource Center air quality staff. This workshop provided an overview of the conformity determination process for transportation planning with a specific focus on the needs of small metropolitan and non-metropolitan areas. Please visit: [www.trbtoolsofthetrade.org/pdf/conf/2008/program\\_082608.pdf](http://www.trbtoolsofthetrade.org/pdf/conf/2008/program_082608.pdf).
- **Testing, Evaluation and Validation of New Emission Models and Methodologies. (FY2008: \$300,000).** This project continued support to the EPA on its development of the Motor Vehicle Emission Simulator (MOVES) model, especially on the interface between transportation and emissions models. This project also supported conducting sensitivity analyses. Preliminary observations based on testing the demonstration version of MOVES were presented at the Transportation Research Board (TRB) 2008 annual meeting. Additional testing and evaluation on the draft version of MOVES is underway.
- **Research on Conducting Project Level Analysis. (FY2008: \$250,000).** A project is underway that synthesizes existing research on project level analysis of particulate matter. This work addresses a requirement in current regulation and builds upon FY2006 FHWA research. EPA is a technical partner for this research.
- **Congestion Mitigation and Air Quality (CMAQ) Evaluation Study. (FY2008: \$310,000).** In SAFETEA-LU Section 1808, Congress required the USDOT, in consultation with EPA, to evaluate and assess the direct and indirect impacts of CMAQ-funded projects on air quality and congestion levels. This study responded to that request by analyzing 67 CMAQ-funded projects, using data supplied by States and MPOs in the FHWA CMAQ database. The study team also conducted additional analyses of the selected set of CMAQ-funded projects to estimate their cost-effectiveness. Please visit: [www.fhwa.dot.gov/environment/cmaqpgs/safetealu1808/index.htm](http://www.fhwa.dot.gov/environment/cmaqpgs/safetealu1808/index.htm)
- **Mobile Source Air Toxics (MSAT) Near Roadway Dissemination Study. (FY2008: \$790,000).** This research involved a study on the behavior of MSAT concentrations in the near road environment in order to further the understanding of how MSAT emissions behave. Please visit <http://www.fhwa.dot.gov/environment/airtoxicsmsat/index.htm>
- **Evaluation and Dissemination of Conformity Practices. (FY2008: \$272,013).** FHWA developed a conformity practices website in conjunction with EPA. The website was designed as an easily searchable repository of examples of transportation conformity documents and processes that could be replicated in other areas of the country. The initial website and functionality were advertised at the Northern Transportation and Air Quality Summit 2008 and the 2008 FHWA

Environmental Conference. Please visit:

<http://www.fhwa.dot.gov/environment/conformity/practices/index.cfm>

### **Water / Wetlands / Vegetation / Wildlife Habitat / Brownfields**

**Emphasis Area Contact:** Carol Adkins

**Level of FY2008 Funding:** \$1,070,000

This emphasis area funded extensive research, training development, database development, and several conferences in FY2008 to support wildlife, ecosystems, wetlands, water quality, and interagency collaboration.

- **Supporting Peer Exchange and Research Dissemination at Environmental Conferences and Workshops. (FY2008: \$85,000).** In FY2008, funds were used to support the International Conference on Ecology and Transportation. This biennial conference brings transportation and biology experts from around the world to examine and share data on research related to the impacts of transportation systems on ecology. The conference was co-sponsored by FHWA, USFWS, EPA, and others.
- **International Stormwater Best Management Practices (BMP) Database. (FY2008: \$50,000).** In order to improve the quality of life for all highway travelers, several initiatives were funded to support and manage the International Stormwater BMP Database, including operation and maintenance of the database clearinghouse and webpage. The long-term goal is to collect sufficient data to permit improvements in BMP designs to better match the selection of BMPs to the stormwater challenges within a watershed. Significant recent project developments included the addition of more data, new data analysis, website upgrades, and simplified data entry. The project continues to distribute database findings and remains a reliable source of information in selection, design, and performance of stormwater management facilities.  
<http://www.bmpdatabase.org/>
- **Research and Innovation Agreements with the USFWS, U.S. Army Corps of Engineers (USACE), and the U.S. Forest Service (USFS). (FY2008: \$350,000).** In FY2008, agreements with USFWS, USACE, USEPA, and USFS were rewritten to emphasize the research needed to improve environmental streamlining and an ecosystem approach to developing infrastructure projects.
- **Optimizing Management of Highway ROW for Environmental Benefit. (FY2008: \$200,000).** This effort involved development of a proposal to include a number of Midwestern states in a coordinated approach to planning and managing ROW for environmental benefit.
- **Linking Eco-Logical to Planning and Project Development. (FY2008: \$100,000).** A national solicitation for applied research to field test the Eco-Logical approach was issued in 2007. In FY2008, the FHWA continued to award 15 cooperative agreements to organizations in 10 states. The grants demonstrate how infrastructure development and ecosystem conservation can be integrated to harmonize economic, environmental, and social needs and objectives. Please visit: [www.environment.fhwa.dot.gov/ecological/eco\\_index.asp](http://www.environment.fhwa.dot.gov/ecological/eco_index.asp).
- **Improvements to Fish and Wildlife Habitat Connectivity. (FY2008: \$100,000).** This effort involves the FHWA Hydraulics team and Central Federal Lands to finalize guidance (HEC-26) on culvert design for aquatic organism passage. Once guidance is finalized, funds will be used to

test the methodology in one or more states. Several states have expressed an interest in being selected to test the methodology.

- **Specific Research to Address Threatened and Endangered Species Concerns on Regional and National Bases. (FY2008: \$165,000).** FHWA held exploratory discussions with two State DOTs and associated USFWS offices to develop pilot projects to implement the USFWS program of recovery credits for threatened and endangered species. Funding will be used to monitor and document improvements to species recovery that result from the pilot. This information will help increase the acceptance of recovery credits as a form of project mitigation.

The following research activities had accomplishments in FY2008 but were funded through prior years of STEP funding.

- **Advancing Methods, Maps, and Tools Used for Decision Support and Impact Analyses for Transportation, Wildlife, and Ecological Systems. (FY2007: \$140,000).** A website was developed to improve the Endangered Species Act (ESA) Section 7 consultation process. The purpose of the website is to improve the quality and consistency of biological assessments and communication between FHWA, State DOTs, and resource agencies. The website is being piloted in three states. An interagency agreement with USFWS was developed to connect the FHWA ESA consultation website and a complementary effort led by USFWS to further streamline and automate the Section 7 consultation process.
- **Weeds Across Borders (WAB). (FY2007: \$50,000).** WAB is an international, biennial peer exchange on costly invasive species and possible solutions. In 2008, each participating country reported on the current status of the invasive species problem and policy changes. The reports were followed by weed research results, BMPs, and partnership examples. The information exchange among Federal, State, and local experts from three countries is unprecedented.
- **National Highway Institute (NHI) Course Development. (FY2007: \$150,000).** Work is underway with an expert panel of FHWA, State DOT, and resource agency staff to develop a web-based course that covers the basics of permitting under Section 404 of the Clean Water Act.
- **Deercrash.com. (FY2006: \$55,000).** This effort sought to reduce animal-vehicle collisions through a combination of research and information dissemination. FHWA partners in this effort include Deer-Vehicle Crash Information and Research Center members such as the DOTs from Connecticut, Iowa, Maryland, Minnesota, New York, Ohio, Texas and Wisconsin. New deer-vehicle crash data, such as the listings of the ten states with the most animal-vehicle collision fatalities, have been added to the website.
- **Vegetation Inventory Protocol Project. (FY2006: \$50,000).** Work is underway by the Mississippi State University to match current technology with needs and applications that are affordable for State DOTs. The University has collaborated with The Nature Conservancy and others using a national standard for data collection. Field testing the protocol and available equipment should result in defining an affordable way for DOTs to inventory all vegetation on ROW to make more effective management decisions. The literature review will be available in FY09.

- **Synthesis on the Fate and Effects of Chloride from Road Salt Applied to Highways for Deicing. (FY2006: \$100,000).** This research investigated the typical amounts of deicing materials, specifically chlorides, used in association with a highway operation, as well as the cost of using deicing material and its effects on human health, aquatic life, and both surface and groundwater quality. Additionally, the research seeks to compare road salt to the other sources of chlorides in the watershed.
- **Cooperative Weed Management (CWMA) Area Training. (FY2006: \$50,000).** Five years ago, Idaho began the partnership concept of CWMAs to better leverage personnel and equipment to control the spread of invasive plants or weeds. FHWA provided two CWMA grants. The western grant supported a national conference, which was hosted by the Center for Invasive Plant Management (CIPM). The eastern grant has provided training to State DOTs and other agency vegetation managers in Michigan and Illinois.
- **Wildlife and Invasives Study. (FY2006: \$125,000).** Two performance criteria for wetland mitigation areas are being evaluated. Invasive species coverage of mitigation areas is typically limited to a small percentage (5%) of the mitigation site coverage area. A FY2004 domestic scan of eight State DOTs found that some State DOTs believe this coverage requirement is too low and not sustainable over the long term. This study compared natural reference wetlands of high ecological value with wetlands established under the Section 404 regulatory program. The second component of the study will catalog wildlife usage of the wetland mitigation areas to determine if mitigation sites are providing comparable habitat value to reference wetlands.
- **Wildlife Vehicle Collision (WVC) Information - Course and Manual. (FY2006: \$100,000).** The Congressional report on WVCs was submitted to Congress in November of 2007. The training manual is the second component of the study. The manual is undergoing final revisions and should be completed in FY2009. The third component of the study, the development of a training course to accompany the manual, should also be completed in FY2009. A pilot course will be undertaken as part of the course development.

### Historic Preservation

**Emphasis Area Contact:** MaryAnn Naber  
**Level of FY2008 Funding:** \$225,000

- **Consideration of Historic Preservation in Early Planning. (FY2008: \$25,000).** This project supports a complementary National Cooperative Highway Research Program (NCHRP) study now underway to identify best practices linking planning and the National Environmental Policy Act (NEPA) for historic and cultural resources. When the initial results of the NCHRP study are made available, the funds will support a follow-up effort.
- **Research and Innovation Agreement with the Advisory Council on Historic Preservation (ACHP). (FY2008: \$200,000).** This agreement supports an effort to develop historic preservation stewardship and streamline outcomes. Through the interagency agreement with the ACHP, FHWA developed a concept paper for integrating historic resources in transportation planning and a webpage on the ACHP website for FHWA programs and information. FHWA also tracked patterns and trends in a case review to identify further areas for streamlining and co-authored a research paper on involving Tribes in integrated planning. Additionally, FHWA supported development and delivery of an Advanced Section 106 seminar and the SAFETEA-LU Section

6005 Pilot Program in California; finally, FHWA participated in the Executive Order (EO) 13274 Streamlining Task Force. STEP funding was also used to inform stakeholders about the STEP program, process, and research that are underway. Presentations on the STEP program were made by the ACHP liaison and FHWA program staff for professional associations and at numerous research events.

### **Bicycle / Pedestrian and Health**

**Emphasis Area Contact:** Gabe Rousseau  
**Level of FY2008 Funding:** \$70,000

- **Interim Report to the U.S. Congress on the Nonmotorized Transportation Pilot Program. (FY2008: \$70,000).** This November 2007 interim report to Congress summarized the progress and initial results of FHWA's and four pilot communities' participation in the Nonmotorized Transportation Pilot Program (NTPP) from the NTPP's inception through May 2007. As stated in SAFETEA-LU Section 1807, the purpose of the NTPP is "to demonstrate the extent to which bicycling and walking can carry a significant part of the transportation load, and represent a major portion of the transportation solution, within selected communities." Please visit: <http://www.fhwa.dot.gov/environment/bikeped/npp/index.htm>

### **Noise**

**Emphasis Area Contact:** Mark Ferroni  
**Level of FY2008 Funding:** \$200,000

- FHWA Traffic Noise Model (TNM) Version 3.0 Development (FY2007: \$50,000; FY2008; \$200,000). The FHWA TNM is used nationally and internationally as a state-of-the-art highway traffic noise prediction and noise barrier design. FHWA is currently developing version 3.0 of the FHWA TNM. Contemporizing FHWA TNM will allow for more efficient upgrades and future maintenance. Several enhancements will be included in TNM Version 3.0. FHWA has conducted surveys and has held discussion groups, comprised primarily of State DOTs and members of the user community, to identify improvements to the graphical user interface and address software bugs and functionality enhancements.

The following research had accomplishments in FY2008 but was funded through a prior year of STEP funding.

- Tire/Pavement Noise Measurements: Temperature Effects Study. (FY2007:\$30,000). This study investigates the influence of temperature on tire/pavement noise to provide guidance on correcting for temperature variations in measured sound levels. Several traffic noise and vehicle pass-by data sets are being examined to help determine trends related to the effects of temperature. Results show that there generally appears to be a trend of slightly decreasing sound levels with increasing temperatures, although the strength of the effect varies by temperature measurement medium (air or pavement), vehicle type, pavement type and age. The variation is enough to warrant an initial recommendation for not applying a general temperature correction to measured data. A report of the study is currently being compiled.

### **Outdoor Advertising Control / Realty Program Management**

**Emphasis Area Contact:** Carolyn James  
**Level of FY2008 Funding:** \$320,000

- **Support of Stakeholder and Partner Outreach and Informational Dissemination Programs. (FY2008: \$50,000).** Several outreach and partnering efforts were pursued that promoted innovative information-sharing among practitioners who implement the Uniform Act and Outdoor Advertising Control programs. Research included:
  - Conducting national meetings such as the National Alliance of Highway Beautification Agencies and Federal Agency Update meetings, which included the Public Real Estate Education Symposium. These meetings shared best practices and discussed technical and programmatic issues.
  - Supporting the FY2008 international ROW scan, which included representatives of Federal and State agencies and the American Association of State Highway and Transportation Officials (AASHTO).
  - Presenting the 2008 Excellence in ROW awards for subjects that included streamlining, integration, and innovation in ROW.
  - Supporting the Real Estate Exchange, an online community of practice for discussion of programmatic issues, available at: <http://knowledge.fhwa.dot.gov/cops/rex.nsf/home>
  - Hosting the 11th Annual Educational Conference on the Control of Outdoor Advertising in partnership with the National Alliance of Highway Beautification Agencies and the Montana DOT to share information regarding best practices, program challenges, and solutions from leading Federal, State, local and industry professionals.
  
- **Identification and Development of Local Public Agency (LPA) Stewardship Tools and Techniques. (FY2008: \$150,000).** The goal of this research program is to identify and evaluate successful LPA stewardship and oversight programs and the common challenges that are faced by both State DOTs and LPAs. A series of teleconferences were held with a representative cross-section of stakeholders involved with this program area. The information gathered during this research indicated that additional course work and training are required to mitigate common challenges. A partnership with NHI was developed to generate training materials. Through this partnership, a workshop was developed to address all aspects of the LPA program as it relates to ROW.
  
- **Update of Local Public Agency (LPA) Acquisition guide. (FY2008: \$20,000).** This research was an additional effort to support the development of LPA stewardship tools. The need for an updated guide was identified from stakeholder outreach for the Identification and Development of LPA Stewardship Tools and Techniques project.
  
- **Peer Exchange - Use of Incentive Payments in ROW Acquisition and Relocation Programs. (FY2008: \$40,000).** A peer exchange was conducted, during which six agencies presented information on the use of ROW incentive programs. The presentations included data on time- and cost-savings. Lessons learned proved that there is great variation in how states develop procedures and implement incentive payments. One agency estimated that using incentive payments saves \$5 million a year. Please visit: [www.fhwa.dot.gov/realestate/incpeerexch.htm](http://www.fhwa.dot.gov/realestate/incpeerexch.htm).
  
- **Neutral Assessment of the National Outdoor Advertising Control Program – National Policy Dialogue. (FY2008: \$60,000).** FHWA has entered into an interagency agreement with the U.S. Institute for Environmental Conflict Resolution in an effort to implement recommendations contained in the Conflict Assessment: Federal Outdoor Advertising Control Program from

January 2007. The Institute will lead an effort to explore ways to reduce conflict or confusion in administering elements of the outdoor advertising control program. Possible outcomes could be additional FHWA guidance or rulemaking. Focus areas could include identifying potential locations for the CEVMS research project and potential signs that might be used for researching factors like brightness or other lighting changes.

- **Integrating and Streamlining Right-of-Way and Utility Processes with Planning, Environment and Design. (FY2008: \$10,000).** This international scan was conducted with destinations in Australia and Canada. Representatives included Federal and state agencies and AASHTO. The report on pilots to test ROW practices is being developed

The following research had accomplishments in FY2008 but was funded through a prior year of STEP funding.

- **Commercial Electronic Variable Message Sign (CEVMS) Study on Driver Attention and Distraction. (FY2007: \$150,000).** The purpose of the study on driver attention is to evaluate the potential safety risks of CEVMSs and evaluate their role in congestion. During Phase I of the project, the most significant measures and issues were identified and evaluated. Phase I also developed research methods needed to secure reliable data information. In Phase II, a preliminary experimental design, the investigation of alternative eye-tracking technologies for outfitting the FHWA test vehicle, and the preparation of a draft set of requirements for an adequate study site were developed.

### **Environmental Streamlining and Stewardship**

**Emphasis Area Contact:** Shari Schaftlein  
**Level of FY2008 Funding:** \$1,663,500

- **Planning and Environmental Linkages (PEL). (FY2008: \$500,000).** FHWA used the following activities to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities:
  - Developed and published the *PEL Implementation Resource Guide* to help practitioners from multiple disciplines better understand how to incorporate PEL into their transportation decision making processes. Please visit: <http://www.fhwa.dot.gov/hep/pel/index.htm>
  - Provided support to Colorado transportation agencies to demonstrate the utility of operating two different software planning tools to support long-range planning in two counties.
  - Organized and hosted a charrette to gather input on how to update the current Linking Conservation and Transportation Planning workshop and hosted two workshops. Workshops were held to help local officials, transportation planners, and conservation experts frame transportation priorities in the context of natural resource conservation and other community priorities. A draft action plan was developed to identify possible policy and process modifications to help link conservation and transportation planning. Please visit: [http://environment.fhwa.dot.gov/integ/resources\\_trainingWkshop.asp](http://environment.fhwa.dot.gov/integ/resources_trainingWkshop.asp)
  - Held a webcast with AASHTO titled "Integrating Transportation Planning and NEPA Decision-Making," which was conducted by the Center for Environmental Excellence by AASHTO in cooperation with FHWA and FTA. The webcast provided an overview of how

transportation planning and NEPA decision-making can be mutually supportive and presented case studies demonstrating successful integration.

Please visit:

[http://environment.transportation.org/center/products\\_programs/integrating\\_webcast.aspx](http://environment.transportation.org/center/products_programs/integrating_webcast.aspx)

- Worked on PEL efforts related to the activities of the Integrated Planning Work Group.
  - Provided technical assistance and contract administration support to the Eco-Logical grant program.
  - Delivered PEL program information to stakeholders through training, websites, conferences, and publications.
  - Researched and documented case studies on institutional mechanisms for successfully implementing PEL approaches employed by four State DOTs.
  - Broadened the focus of PEL to include emerging issues such as climate change, non-motorized transportation, and freight.
- **Advancing Innovations in FHWA's Environmental Review Process. (FY2008: \$455,000).** FHWA undertook a number of initiatives to advance innovations in the environmental review process:
    - Monitored and documented the impact of the SAFETEA-LU Environmental Review Process. Compiled an internal report on the effectiveness of the Section 6002 environmental provisions.
    - Continued the development of performance measurement systems, including the Environmental Document Tracking System, to gather timeliness and project management data.
    - Developed a workshop highlighting exemplary GIS and visualization practices in NEPA with an emphasis on applications that aid scoping.
    - Compiled state of the practice information on incorporating freight needs, impact analysis, and alternatives selection in NEPA.
    - Supported the Project Delivery Management Domestic Scan to identify best management practices in project management and program delivery related to the environment.
    - Developed a compilation of agency-specific reports and a user guide to the National Environmental Performance Review Gallup study.
- **Environmental Stewardship and Streamlining Outreach and Technology Transfer. (FY2008: \$258,500).** FHWA has made substantial investments in developing methods, tools and techniques to improve the quality and efficiency of environmental decision making. Through this research effort, FHWA supported a number of ongoing technology transfer and outreach initiatives in FY2008:
    - Held the FHWA Environmental Conference with over 230 environmental professionals in attendance.
    - Maintained and updated the Environmental Review Toolkit, which is available on the FHWA website. The toolkit was accessed by 178,000 users in FY08.
    - Provided continued support for Re: NEPA, FHWA's extremely active community of practice with over 1,500 environmental professionals as registered users. Please visit: <http://www.environment.fhwa.dot.gov/>.
    - Promoted conflict resolution tools and techniques; developed and held a pilot workshop on ESA consultation in California.

- Published 12 issues of *Successes in Stewardship* newsletter that highlighted current environmental streamlining practices from around the country. Please visit: <http://environment.fhwa.dot.gov/strmlng/index.asp>.
- **Executive Order (EO) 13274 Implementation Activities. (FY2008: \$340,000).** This research effort supports implementation of EO 13274, *Environmental Stewardship and Transportation Infrastructure Project Review*. Activities in FY08 included:
  - Provided management and logistical support for two EO Task Force Meetings.
  - Completed the 2008 *Report to the President*.
  - Provided support for Integrated Planning Work Group efforts including: outreach and interagency training on the new FHWA planning regulations, outreach and training on Eco-Logical principles and overcoming implementation barriers, and compilation of best practices in corridor, sub-area and tiering studies.
- **Environmental Competency Building. (FY2008: \$110,000).** This research effort is aimed at addressing the current and future multidisciplinary professional development needs of those working in transportation and environmental fields. In June 2008, FHWA released the Competency Navigator, an online resource tool for assessing the types and degrees of environmental competencies recommended for various disciplines. The Competency Navigator links professionals to specific competency-related tools and resources.

The following research activities had accomplishments in FY2008 but were funded through prior years of STEP funding.

- **Linking Eco-Logical to Planning and Project Development. (FY2007: \$400,000).** A national solicitation for applied research to field test the Eco-Logical approach was issued in 2007. Applications were received from nonprofits, universities, local, regional, State, and Federal agencies. In FY08, FHWA awarded 15 cooperative agreements to organizations in 10 states totaling approximately \$1.4 million. These grants will serve as a demonstration of how infrastructure development and ecosystem conservation can be integrated to harmonize economic, environmental, and social needs and objectives. Data gathering is underway to document and implement lessons learned.
- **Assessment of the Surface Transportation Project Delivery Pilot Program: Evaluating FHWA's Role in the NEPA Process. (FY2007: \$240,000).** The first onsite audit of Caltrans under the pilot program was performed in January 2008. This activity included audit planning, preparing the audit team, developing logistics for the onsite audit, and interviewing Caltrans staff. The audit also involved reviewing documents, compiling and finalizing the findings, as well as drafting and finalizing the audit report. Please visit: <http://edocket.access.gpo.gov/2008/E8-22131.htm>

### Context Sensitive Solutions

**Emphasis Area Contact:** Shari Schaftlein  
**Level of FY2008 Funding:** \$500,000

- **Context Sensitive Solutions (CSS) Clearinghouse. (FY2008: \$350,000).** The CSS Clearinghouse supports the increased demands for information on innovations and problem solving strategies related to applying CSS principles to project development. FHWA utilized stakeholder input to

transform the current CSS website to an expanded and more interactive clearinghouse. Planning is underway to host webinars, podcasts, and problem solving white papers. Please visit: <https://www.fhwa.dot.gov/planning/css/>

- **Targeted Technical Assistance. (FY2008: \$150,000).** This research effort supported active exchange and delivery of best professional practices and results of existing CSS research. Specialized technical assistance is being provided to 13 states. Some examples include:
  - New Mexico’s incorporation of CSS into their new design manual. Reference support material has been provided and includes case studies in the southwest, performance measures, and CSS policies and procedures from other design manuals from around the country.
  - Massachusetts’ development of a workshop for roadway and bridge staff to work through the steps of a CSS process for two or more current bridge projects.
  - California’s integration of CSS in corridor planning as well as the new California state requirement for full consideration of bicycle and pedestrian concerns.

## Emphasis Areas Related to Planning

### Congestion

**Emphasis Area Contact:** Harlan Miller  
**Level of FY2008 Funding:** \$750,000

- **Intelligent Transportation Systems (ITS) Development Analysis System (IDAS) Maintenance Contract. (FY2008: \$75,000).** Two IDAS/ SCReening for ITS (SCRITS) workshops were conducted in 2008. These workshops demonstrated MPOs’ and State DOTs’ use of the IDAS and delivered presentations on IDAS to planners. Other efforts involved maintenance of the IDAS software, assistance to MPOs and State DOT software users, response to questions from software users, and minor software updates. IDAS software allows planners to analyze the benefits of ITS and operational improvements in the planning process. It is an important analytical tool to aid efforts to integrate operations with planning.
- **Development of Guidance on Including Operational & Management Strategies in the Metropolitan Long-Range Transportation Plan (MLRTP). (FY2008: \$50,000).** *Management and Operations in the Metropolitan Transportation Plan: A Guidebook for Creating an Objectives-Driven, Performance Based Approach* was published in June 2008. This publication provides a framework for MPOs to link operations and the transportation planning process. Better linkages between planning and operations have significant congestion benefits. These linkages result in a regional perspective on operations strategies rather than an individual project perspective. The results are prioritized strategies that make the existing transportation system work more efficiently. The guidebook is available at: [www.ops.fhwa.dot.gov/publications/moguidebook/index.htm](http://www.ops.fhwa.dot.gov/publications/moguidebook/index.htm)
- **Development of Guidance Materials on Congestion Management Processes (CMPs) in Transportation Management Associations (TMAs). (FY2008: \$50,000).** *An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning* was published in February 2008. This publication guides MPOs on how to improve their CMP and use the CMP to

integrate operations into the planning process. The interim guidebook is available at:  
[www.ops.fhwa.dot.gov/publications/cmppguidebook/index.htm](http://www.ops.fhwa.dot.gov/publications/cmppguidebook/index.htm).

- **Develop and Document Case Studies on Five State Processes for Identifying Congestion Bottleneck Locations, Developing Solutions, and Prioritizing Investments. (FY2008: \$100,000).** Two bottlenecks workshops were conducted in an effort to develop and document case studies on five state processes for identifying congestion bottleneck locations, developing solutions, and prioritizing investments. The congestion bottlenecks primer has also been completed. The bottlenecks workshops and the primer build awareness at State DOTs, MPOs, and local agencies on implementing low-cost, quick, and easy solutions to traffic congestion. Five State DOT site visits have also been completed along with bottlenecks process interviews. Please visit: [www.ops.fhwa.dot.gov/publications/bnprimer/index.htm](http://www.ops.fhwa.dot.gov/publications/bnprimer/index.htm).
- **Scope, Plan, and Conduct CMPs Workshops. (FY2008: \$117,298).** Seven strategically located informational workshops on the CMP and management and operations (M&O) in the planning process were conducted in FY2008. These workshops focused on sharing information from the CMP and M&O guidebooks to equip transportation planners and operators from MPOs, State DOTs, transit agencies, and local operating agencies to lead transitions toward an objectives-driven, performance-based approach to addressing planning for operations in their regions, in accordance with SAFETEA-LU planning. The workshops also promoted CMP, M&O, and planning linkages opportunities. Workshop participants provided feedback on the content of the guidebooks as well as examples of good practice.

### Safety Planning

**Emphasis Area Contact:** Lorrie Lau  
**Level of FY2008 Funding:** \$100,000

Research is currently underway to promote and facilitate expanded transportation safety planning implementation in the traditional transportation planning processes at all levels.

- ***Making the Case for Transportation Safety Ideas for Decision Makers. (FY2008: \$102,148).*** FHWA released and distributed this publication, which compiles noteworthy practices, key accomplishments, results, contact information, and other resources. An Implementation Process Model and pilot project are also underway. States will be selected to participate in a pilot of the draft process model to test feasibility of the Strategic Highway Safety Plan. Input gathered from the pilot will help refine the draft process model. Additionally, an NHI training course (“Transportation Safety Planning”) is being updated to reflect the intent of the Federal legislation and guidance, as well as achieve consistency with transportation safety planning efforts.

The following research had accomplishments in FY2008 but was funded through a prior year of STEP funding.

- **The Transportation Planner’s Safety Desk Reference. (FY2007: \$65,000).** This reference identifies and summarizes the information of interest to transportation safety planners in the NCHRP Report 500 Series. The report describes an overview of transportation safety, the potential roles that transportation planners can play to advance it, a framework for

incorporating safety into the transportation planning process, available sources that may be accessed to fund safety programs, and a menu of possible safety strategies.

Please visit: [http://tsp.trb.org/assets/FR\\_Safety%20Planner\\_1\\_17\\_07FINAL.pdf](http://tsp.trb.org/assets/FR_Safety%20Planner_1_17_07FINAL.pdf)

### **Freight Planning**

**Emphasis Area Contact:** Spencer Stevens

**Level of FY2008 Funding:** \$100,000

Research in the freight planning area during FY2008 had two objectives: 1) link a newly developed method for estimating intra-metropolitan freight flows with widely used transportation planning software and 2) use the model for analysis of regional development and traffic management strategies to illustrate the model's utility in planning practice.

**Freight Planning. (FY2008: \$100,000).** Research efforts continued on how to effectively engage the private sector freight community into the state and metropolitan planning processes, how parameters such as price, travel time, permitting, and user fees affect modal shift, and the benefits/costs of freight projects. Research is currently underway to promote activities on the integration of freight into the transportation planning and programming processes at the state and metropolitan levels. Examples of such research include:

- Developing a best practices guidebook for engaging the private sector in transportation planning that complements the FHWA Resource Center's publication on *Engaging the Private Sector in Freight Planning Workshop* (FY2007: \$75,000).
- Building Capacity between Public and Private Sectors in the Freight Community. (FY2007: \$100,000). This effort involves: 1) hosting two peer exchanges and a freight summit meeting, 2) developing a resource manual, and 3) identifying possible performance measures in involving the private sector in freight planning.
- Integrating the "Evaluation of Freight Corridor Projects" document into the Congestion Management Process (CMP) and Long-Range Transportation Planning (FY2008: \$60,000). This effort involves: 1) collecting truck data in the Puget Sound Region, 2) developing freight performance measures and incorporating them into the CMP and metropolitan transportation plan, and 3) documenting the effort so that it is replicable in other regions. Investigative analysis is being performed to determine areas where the MPO's travel demand model can be improved for truck travel.

### **Public Involvement, Environmental Justice, and Visualization in Planning**

**Emphasis Area Contact:** Brenda Kragh

**Level of FY2008 Funding:** \$375,000

Research in FY2008 supported public outreach efforts that promote linking transportation and environmental sustainability through regional planning. These efforts included engaging the public, reviewing content online, considering approaches to media engagement, preparing visuals and scripts, and recruiting sponsors as well as assembling data. Research is ongoing to assist MPOs in improving nondiscrimination approaches to planning and providing assistance to achieve better certification review results.

- **FHWA/Florida DOT Community Impact Assessment Website. (FY2008: \$13,200).** The website evaluates the effects of a transportation action on a community and its quality of life. This

information from the assessment process can then be used continuously to mold the project and provide documentation of the current and anticipated social environment of a geographic area with and without the action. Please visit: [www.ciatrans.net/about\\_cia.html](http://www.ciatrans.net/about_cia.html)

- **Public Involvement Techniques Website. (FY2008: \$18,000).** The website provides the building blocks for state and local transportation agencies to create effective public involvement programs and plan, design, and build a better transportation system by addressing current challenges and opportunities. Please visit: [www.fhwa.dot.gov/REPORTS/PITTD/COVER.HTM](http://www.fhwa.dot.gov/REPORTS/PITTD/COVER.HTM)
- **The Citizen's Guide to Transportation Decision-Making. (FY2008: \$15,000).** This guide is currently being updated. The guide will discuss the Federal requirements for the transportation decision-making process and explain how transportation decisions are made at the local, state and national levels. The guide will help citizens better understand and participate in the transportation decision-making process to promote the development of a transportation system that is safe, efficient, and responsive to public needs and concerns.

### Other Activities that Support State/Local/Tribal Planning Capacity Building

**Emphasis Area Contact:** Robert Ritter  
**Level of FY2008 Funding:** \$2,425,000

Research in FY2008 supported numerous outreach activities, including peer exchanges on asset inventory and condition assessment practices, innovative financing techniques, as well as plans and strategies for aligning and sustaining information, data, and technology to support transportation decision-making. These events responded to priority capacity building needs identified by an AASHTO task force. Other accomplishments, which are organized by topic area, included:

- **Finance Issues. (FY2008: \$250,000).** Research is currently underway to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities, improve financial management, and identify innovative finance opportunities.
- **Improved Planning/Process Management. (FY2008: \$350,000).** The 2008 FHWA/FTA Transportation Planning Excellence Awards Program, which is co-sponsored by the American Planning Association, recognized outstanding initiatives across the country to develop, plan, and implement innovative transportation planning practices. A list of award recipients can be found at: <http://www.fhwa.dot.gov/planning/tpea/index.htm>.
- **Information Dissemination. (FY2008: \$250,000).** Research is currently underway to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities. The issues included developing tools, techniques, procedures, and identifying exemplary planning practices, delivering training, technical assistance, and conducting peer exchanges on planning issues, documenting and deploying interdisciplinary/interagency approaches for addressing human and natural environment in the planning process, performance based-planning, and identifying other issues and interests in the planning processes. Most of these activities were conducted as part of the Transportation Planning Capacity Building Program. Please visit: <http://www.planning.dot.gov/>

- **Land Use Planning. (FY2008: \$150,000).** This research supported and promoted the concept of integrating land use and transportation into the planning process at a regional level. A Transportation and Land Use Planning Tour was conducted to identify the relationship between transportation and land use planning. This effort has garnered increased attention as FHWA and State DOTs seeking to maximize the efficient movement of current and future projected people and goods on the existing transportation system. The scan promoted information- and experience-sharing between European countries and U.S. transportation and land use planners.
- **Metropolitan Transportation Planning Issues. (FY2008: \$250,000).** This effort will also provided variability, research, technical assistance, and information dissemination specifically for MPOs to ensure successful continuing, cooperative, and comprehensive planning processes. A workshop on the Development of Regional Transportation Operations Collaboration and Coordination Initiatives was conducted to develop and advance key initiatives on that topic.
- **Planning and Environment Linkages (PEL). (FY2008: \$500,000).** Research is currently underway to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities and to support PEL.
- **Rural Transportation Planning Issues. (FY2008: 125,000).** Research is currently underway to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities and to support rural transportation planning.
- **Statewide Transportation Planning Issues. (FY2008: \$350,000).** Research is currently underway to provide assistance to decision makers, transportation officials, and staff to resolve the complex issues they face when addressing transportation needs in their communities and to support statewide transportation planning. The *Transportation Planning Process: Key Issues A Briefing Notebook for Transportation Decisionmakers, Officials, and Staff* provided government officials, planning board members, transportation service providers and the public with an overview of transportation planning. The briefing book is available at: [www.planning.dot.gov/documents/BriefingBook/BBook.htm](http://www.planning.dot.gov/documents/BriefingBook/BBook.htm).
- **Tribal Planning. (FY2008: \$200,000).** Research is currently underway to develop reference materials and promote linkages on effective tribal planning practices for statewide, metropolitan, and Tribal/Federal planning and programming. Examples of such reference materials include a series of modules on "Transportation Decision Making Information Tools for Tribal Governments," which provided an overview of fundamental, conceptual techniques, as well as case studies and noteworthy practices on State, MPO, and Tribal coordination in transportation planning. Additionally, research has defined and implemented strategies and approaches to increase the professional capacity and proficiency of Federal-aid and Federal Lands Highway in coordinating respective program areas related to transportation planning and programming. Also supported were activities such as training and technical assistance, information dissemination, peer exchanges, conferences, workshops, and the development of

Tribal planning notable practices through case studies. Please visit:  
<http://www.fhwa.dot.gov/hep/tribaltrans/topics.htm>.

## **US/Canada and US/Mexico Border Planning**

**Emphasis Area Contact:** Roger Petzold  
**Level of FY2008 Funding:** \$400,000

This research built on existing research in the border area and addressed the changing situation along the border. The research contained partnerships at the local, state, Federal and international levels.

- **U.S./Canada Transportation Border Working Group. (FY2008: \$200,000).**
  - **Enhanced Border Information Needs.** This effort involved conducting a binational border data workshop to examine current data available, potential new data sources, and identify data needs for border transportation management. A follow-up study to the workshop was also conducted for enhanced transportation planning and operations.
  - **Future Approaches to Meet Border Information Needs.** This effort involved development of performance measures and best methods to meet binational data needs, as well as identification of new data sources and innovative approaches to gather information.
  - **Cross-Border Data and Freight Needs.** This effort involved sponsorship of the North American Initiative to address cross-border data and freight needs. The North American Freight Flow Conference/Understanding Changes and Improving Data Sources was held with participation from transportation agencies from the U.S./Mexican and U.S./Canadian border regions. The purpose was to investigate better ways to address changing freight plans between the three countries.
  - **Regional Border Workshop.** This workshop was the first in a series of regional border workshops to improve cross-border communication and innovative solutions to address border transportation issues.
  - **Great Lakes Public-Private Partnership Workshop.** The Great Lakes Public-Private Partnership Workshop focused on public sector issues.
  - **Economic Impact on Transportation of the U.S./Canada Border.** This study is addressing the economic costs of current travel times and analyzing economic savings from reduced travel times that resulted from the Free and Secure Trade Program, NEXUS, and other improvements at border crossings. This study is focusing on analyses of transportation costs for both people and goods along the northern border, changes in cross-border travel time, and the economic costs of current and future travel time at Points of Entry (POEs) at the U.S./Canada border. This study will develop a methodology to quantify delay cost on a regional basis.
  - **Border Wait Times.** FHWA manages an effort to measure travel times in freight significant corridors and border crossing times at major U.S. land border crossings. Border crossing times indicate transportation system performance. It is desirable to use delay and crossing time information, along with other information (e.g., freight and

passenger volumes) to target transportation investments where the greatest needs exist. FHWA's program currently uses satellite technology and is developing terrestrial technology to automatically measure travel and border crossing times. In the longer term, FHWA will work with Canada and Mexico to develop a strategy to reflect transportation border travel times for the entire U.S.

- **Online Inventory of Land Border Crossings.** This effort included completing data entry for 120 land border crossings (including facilities and infrastructure projects) to coordinate infrastructure investment along the border.
- **Innovative Finance Workshops for Border Projects.** This continuing series of conferences and workshops is being planned in the border region to look for innovative methods to finance both transportation and border infrastructure projects. These efforts have facilitated a dialogue between the public and private sector that have resulted in several unique financing packages for better infrastructure investments.
- **Land Border Port of Entry National Conference.** The conference was jointly sponsored by the FHWA, General Services Administration, and the U.S. Customs and Border Protection to coordinate the planning and construction of land POEs in the border region.
- **U.S./Mexico Transportation Joint Working Committee (JWC). (FY2008: \$200,000).**
  - **Border Travel Time studies.** The objective of these studies is to provide a baseline of border crossing delay by measuring border crossing times for commercial trucks at border crossings. These baseline data will be used to help measure the success of improvement projects, policies, and strategies, as well as to develop performance measures. Four pilot studies are underway.
  - **Bottlenecks Study Phase II.** Using the methodology developed in the earlier JWC bottlenecks studies, additional bottlenecks studies are being conducted along the Texas/Mexico and Nogales, Arizona/Nogales, Mexico borders. The study identifies potential congestion improvements and highlights those that are low-cost, high-impact solutions.
  - **Traffic Studies and Travel Demand Modeling Peer Exchanges.** In an effort to provide accurate short-, medium-, and long-term traffic projections for cross-border travel, select traffic studies are being conducted that will provide information to populate travel demand models. In addition, existing cross-border and POE travel demand forecast modeling techniques were discussed and evaluated to reach understanding and enhance knowledge of existing systems. These discussions produced solutions for improved cross-border modeling. The peer exchanges were held to discuss the Nogales, AZ, and Pharr, TX, traffic studies and to improve planning along the U.S./Mexico border. Please visit: <http://www.borderplanning.fhwa.dot.gov/studies.asp>
  - **Innovative Finance/Public Private Partnership.** This effort involves identification of border projects for which specific technical assistance to structure finances would advance the project.

- **Regional Border Master Plans.** This research effort involves development of a compendium of border-wide regional master plans. The first plan includes a comprehensive and prioritized assessment of transportation needs along the border, including at POEs and the San Diego/ Tijuana area. The Master Plan provides the next logical step for a comprehensive, binational transportation planning process. The data will be used to adequately evaluate growth and future capacity needs at the border and to more realistically forecast future conditions in the border region.

### **National Security, Defense, and Interstate Planning**

**Emphasis Area Contact:** Stefan Natzke

**Level of FY2008 Funding:** \$300,000

- **Highway System and Corridor Support. (FY2008: \$140,000).** Accomplishments of this effort include analyzing and tracking research results, developing material to support comments to grantees or other recipients during the course of the grant, contract, or financial agreement, and formatting images for use in research. Other accomplishments were managing databases used to support research and producing documentation on Interstate service roads and Interstate history as well as the National Highway System (NHS) Interstate log book.
- **National Highway System (NHS) Designation and Product Development. (FY2008: \$130,000).** Accomplishments include updating NHS coding on the base GIS network and updating NHS PDF maps for online posting. Please visit: [www.fhwa.dot.gov/planning/nhs/](http://www.fhwa.dot.gov/planning/nhs/)
- **Monitoring of Case Studies; Interstate and NHS Economic Development. (FY2008: \$30,000).** Accomplishments included a kick-off with the consultant to discuss study process, timing, and deliverables.

### **Emphasis Areas Related to Tools to Support Planning and Environment**

#### **Travel Modeling**

**Emphasis Area Contact:** Frederick Ducca

**Level of FY2008 Funding:** \$730,000

Research is currently underway to develop and put dynamic network and activity-based modeling technologies into practice. Recognizing and responding to the need for better information on highway congestion and pricing policies, this research has developed advanced technologies and supported practical implementation of advanced modeling tools.

- **Travel Model Improvement Program (TMIP). (FY2008: \$755,869).** The TMIP helped planning agencies improve the techniques they use to inform their decision makers on how population and employment growth, development patterns, and investments in transportation infrastructure are likely to affect travel, congestion, air quality, and quality of life. Please visit: <http://tmip.fhwa.dot.gov/>. Specific activities included:
  - **A Snapshot of Travel Modeling Activities.** FHWA conducted site visits as a follow-on to NAS Report 288 and summarized the visits of MPOs in *A Snapshot of Travel Modeling*

*Activities*, which determined how travel demand models and the resulting travel forecasts have been used in the regional planning process and how travel demand models are used to address emerging issues. The report is available at:

[http://tmip.fhwa.dot.gov/clearinghouse/docs/mpo/mpo\\_snapshot.pdf](http://tmip.fhwa.dot.gov/clearinghouse/docs/mpo/mpo_snapshot.pdf)

- **FHWA Travel Model Improvement Program (TMIP) Peer Review Program.** The program provides the modeling community with insight and experience in modeling issues. The practice of producing and posting a written report for each peer review, presenting the peer review program and results at conferences, and publishing synthesis of peer review issues improves the state-of-the-practice of travel demand forecasting. The TMIP continued the peer review program for a fourth year in FY2008. Please visit: [http://tmip.fhwa.dot.gov/services/peer\\_review\\_program/documents/semcog/](http://tmip.fhwa.dot.gov/services/peer_review_program/documents/semcog/).
- **Travel Model Validation Practice Peer Exchange.** The peer exchange was held to contribute to the improvement of travel model validation practice. The TMIP initiated the exchange in response to NAS Report 288. The exchange discussed validation errors by validating the ability of a model to predict future behavior and comparing its predictions with information other than that used in estimating the model. A white paper serves as practical advice to travel modeling professionals in Federal, state, local and private agencies regarding travel model validation. The white paper is available at: <http://tmip.fhwa.dot.gov/>
- **TMIP Monthly Webinars.** The webinars focused on topics of interest to the planning, modeling and simulation communities. Eleven webinars were held with an estimated attendance of 1,800 for all webinars.
- **TMIP Clearinghouse.** The clearinghouse is a comprehensive collection of material on travel demand forecasting and related subjects. The clearinghouse exists to supply documentation and data to the travel model community.
- **TMIP E-Mail List.** The e-mail list provided a forum for modelers to exchange technical information and discuss modeling topics.
- **Technical Syntheses.** The syntheses provided technical summaries of current discussion topics and generated significant interest from the TMIP stakeholders. The syntheses capture and organize worthwhile thoughts and discussions into one concise document. Five syntheses were published in FY08. Please visit: [http://tmip.fhwa.dot.gov/discussions/technical\\_synthesis/archive/2008/january.stm](http://tmip.fhwa.dot.gov/discussions/technical_synthesis/archive/2008/january.stm)
- **Census Transportation Planning Package (CTPP) Support. (FY2008: \$85,000).** Provided technical assistance to users of the CTPP.
- **National Vehicle Miles Traveled (VMT) Forecasting Methods. (FY2008: \$113,976).** Developed improved methods to forecast nationwide VMT estimates based on economic and demographic factors.

- **Travel Survey Archive. (FY2008: \$25,000).** Collected data sets from State DOT and MPO travel surveys; put data sets into a standard format to improve data comparability and accessibility.

### **GIS and Spatial Information for Improved Decision Making**

**Emphasis Area Contact:** Roger Petzold

**Level of FY2008 Funding:** \$400,000

FHWA is supporting workshops and research to share effective practices and encourage the use of geospatial technologies to enhance decision making in planning and project development processes. Initiatives included:

- **Geographic Information System (GIS) Outreach and Promotion. (FY2008: \$100,000).** Fifty examples of geospatial technology applications were added to the state/local practices database on the GIS in Transportation website. This site serves as a resource for GIS practitioners interested in learning about these types of applications. In addition, accomplishments included planning and development of a quarterly webcast series on GIS in transportation. The first webcast occurred in November 2008 and focused on Florida DOT's efforts to implement an enterprise GIS. [www.gis.fhwa.dot.gov/](http://www.gis.fhwa.dot.gov/).
- **Best Practices and Case Studies. (FY2008: \$60,000).** Accomplishments included completion of a report on *Business Models for Implementing Geospatial Technologies in Transportation Decision-Making: Phase Two*. This report describes a number of State DOTs' business models for implementing geospatial technologies to facilitate decision making. In addition, the *Key Practices for Implementing Geospatial Technologies for a PEL Approach* report was completed. The PEL approach provides information and tools to help agencies integrate consideration of environmental factors in transportation planning. Please visit: [www.gis.fhwa.dot.gov/](http://www.gis.fhwa.dot.gov/).
- **Peer Exchanges. (FY2008: \$90,000).** Accomplishments included the GIS and ROW Peer Exchange II, which occurred in July 2008. Participants discussed progress they had made since the previous GIS & ROW Peer Exchange in 2007 and received an update on the progress of the NCHRP Project 8-55A, *Developing a Logical Model for a Geospatial ROW Information Management System*. In addition, peer exchanges on GIS Application in the Bicycle and Pedestrian Transportation Area and on Geospatial/3D Visualization are being planned.
- **Development of the Transportation for the Nation Workshop. (FY2008: \$25,000).** This effort involved sponsorship of the *Improving National Transportation Geospatial Information* workshop in December 2007. Participants offered their input on data needs, technological possibilities, and building a case for a national geospatial transportation infrastructure.
- **Future Directions of the National Highway Planning Network (NHPN). (FY2008: \$75,000).** Accomplishments included the NHPN Improvement Project, which will update the NHPN by transferring attributes from the original database to a new network using the road network databases from all the State DOTs.

The following research activities had accomplishments in FY2008 but were funded through prior years of STEP funding.

- **Peer Exchange on GIS for PEL. (FY2007: \$30,000).** FHWA sponsored a 1.5-day peer exchange in October 2007 that focused on select State DOTs' applications of GIS for PEL. The purpose of the peer exchange was to explore how GIS can help accomplish the goals of PEL.
- **HEPGIS. (FY2007: \$65,000).** The Office of Planning, Environment, and Realty Executive Geographic Information System (HEPGIS) provided electronic maps and data to transportation planners. HEPGIS displays the National Highway System, Federal lands, urban areas and metropolitan boundaries, as well as U.S. Census data. Transportation planners make use of the data in several ways including using the information for project identification, boundary definition, and highway functional class classification. HEPGIS allows internal and external users to retrieve and display FHWA-created and -maintained GIS databases over the internet without GIS software installed in the users' machine.

### **Program Management and Outreach**

**Emphasis Area Contact:** Felicia Young  
**Level of FY2008 Funding:** \$1,000,000

- **STEP Program Management and Outreach. (FY2008: \$171,475).** The FY2008 STEP was announced in December 2007. A Federal Register Notice was published in June to solicit research ideas for the FY2009 STEP.
- **Website Support for Office of Planning, Environment, and Realty (HEP) Research and Programs. (FY2008: \$416, 630).** The STEP feedback system and STEP website were utilized to provide information on the STEP and to solicit feedback from STEP stakeholders. Information on STEP-funded research efforts was also included on other HEP websites
- **Financial Management Support. (FY2008: \$411,895).** Approximately 380 total transactions in the Research and Financial Management Database for HEP in FY2008 (including all funding sources).

## Appendix C

### Feedback from STEP Stakeholders

The STEP program’s legislative background mandates that the program’s budget and research recommendations be based on feedback, suggestions, and priorities outlined by STEP stakeholders. The legislation does not prescribe a particular method for collecting feedback. The STEP Implementation Strategy, published in July 2006, describes various stakeholder groups and outlines ways that STEP program managers might collect information.

In FY08, the Web-based STEP stakeholder feedback mechanism continued to be a primary method to collect stakeholder feedback and report feedback to emphasis area contacts. This mechanism captures basic personal information about the stakeholder (including his or her name, title, agency, and affiliation type). Additionally, the mechanism asks stakeholders to answer a series of questions about the STEP in order to gather information such as:

- Suggestions on the lines of research that should be pursued in a particular emphasis area;
- Other current or planned research projects in this emphasis area;
- Potential funding sources for research suggestions or recommendations; and
- General comments about the STEP program.

The Web-based feedback mechanism was the preferred vehicle for submitting comments. However, in some cases, individuals or entities submitted suggestions by fax, email, or phone. In these cases, the information was added to the STEP feedback database through the Web-based mechanism.

This chapter provides an overview of feedback received, including descriptive statistics about the nature of comments and submitters. (Appendix C provides a summary of feedback received in each emphasis area.) This stakeholder feedback provides the foundation for the research recommendations discussed in Chapter 4.

#### FEEDBACK OVERVIEW

Nearly three hundred comments were received between June and August 2007. In some cases, organizations or associations submitted feedback to several different emphasis areas that pertain to their own work.

While some emphasis areas (e.g. Water, Wetlands, Vegetation, Wildlife, Habitat, and Brownfields) received a great deal of comments (35%) at least one comment was received in each of the seventeen emphasis areas and in the Overall STEP Comments.

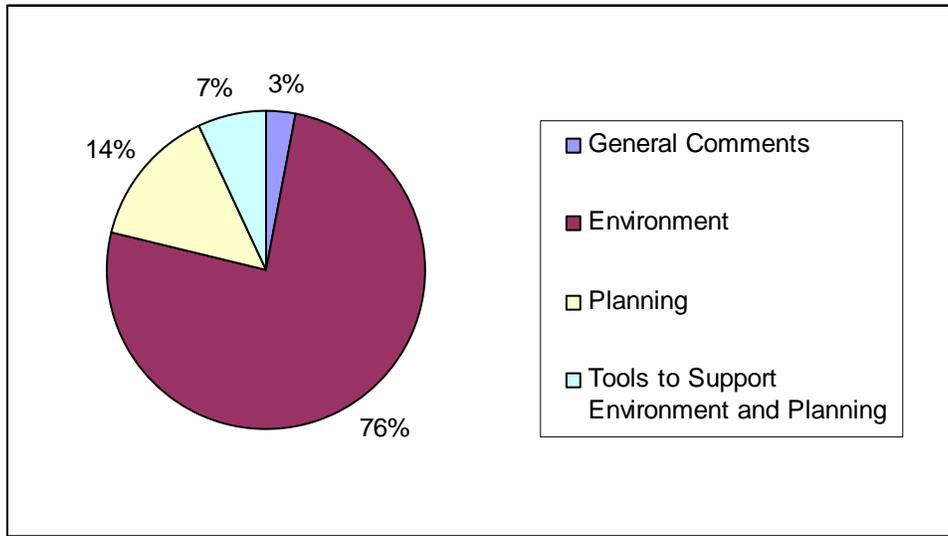
The figures below display the breakdown of comments received that pertain to the broad program areas, and to the individual emphasis areas.

#### *Notable Quotes from Stakeholders*

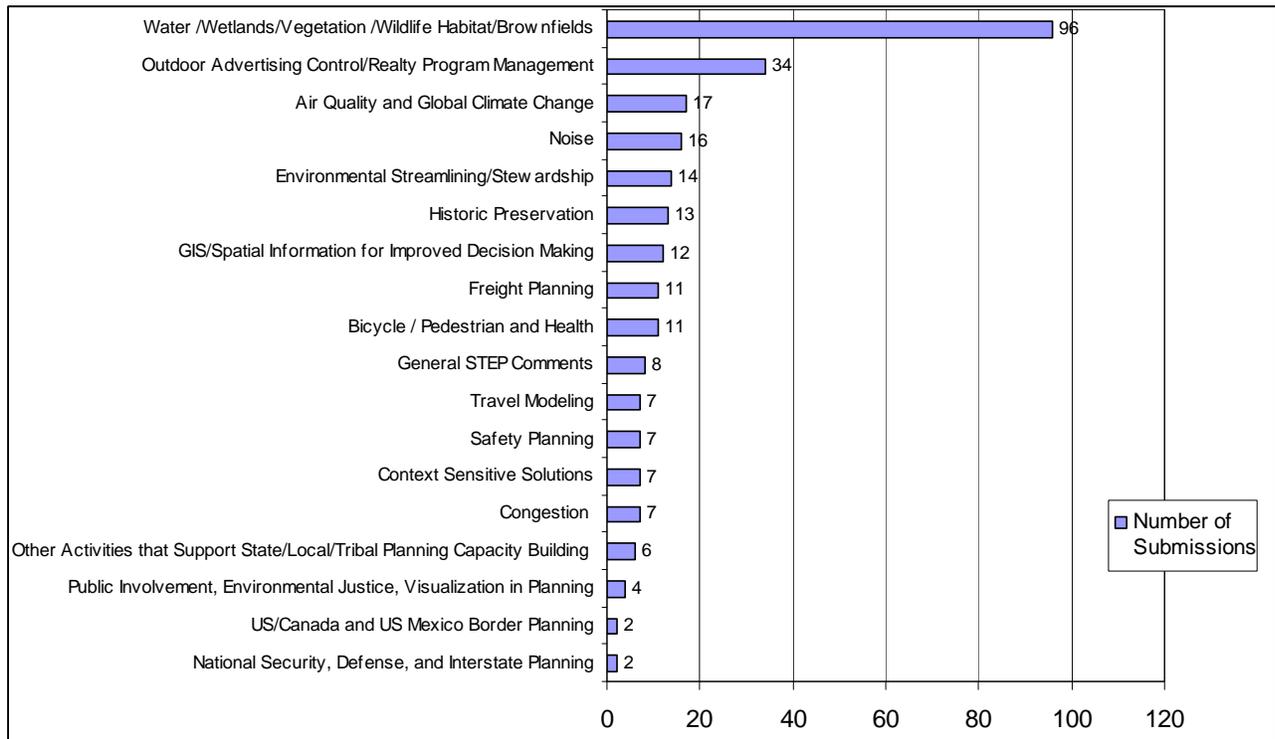
“The STEP program is playing and can continue to play a significant role in helping build capacity for transportation professionals”

“FHWA and US DOT should be congratulated on looking forward and continually trying to better their business practices.”

“Thanks for the opportunity to comment. Seems like an excellent way to contribute to current environmental problems.”



**Figure 1: Distribution of Feedback by Program Area (FY08)**



**Figure 2: Distribution of Feedback by Individual Emphasis Area (FY08)**

As described in Chapter 2, STEP stakeholders are organized into three tiers: Federal partners (Tier I), state and local governments (Tier II), and non-governmental transportation and environmental stakeholders (Tier III).

The Web-based feedback mechanism required stakeholders to describe their affiliation by selecting a response from a pre-defined list. This list included the entities described above (e.g. Federal, state, local, research/academic, national association, private sector, individual citizen or “other” affiliation). In

some cases, stakeholders inadvertently listed their affiliation as Federal, when their organization name indicated a different affiliation type. In these cases, data were corrected prior to analysis. All tiers and affiliations were represented in FY08 comments; see the tables that follow for a distribution of comments.

**Table 1: Distribution of Feedback by Affiliation Type**

	<b>274</b>	<b>100%</b>
Federal Government	49	18%
State Government	89	32%
Local Government	9	3%
National Association	32	12%
Private Sector	33	12%
Research / Academic	36	13%
Individual Citizen	5	2%
Other	21	8%

**Table 2: Distribution of Feedback by Tier**

	<b>274</b>	<b>100%</b>
Tier 1	49	18%
Tier 2	98	36%
Tier 3	127	46%

Since communication and collaboration with stakeholders are critical to the implementation of the STEP, the Web-based stakeholder feedback mechanism captured email addresses for those individuals who wish to remain informed about the STEP. STEP program managers and emphasis area contacts may wish to contact stakeholders to gather more information, share updates about STEP, or to simply stay in touch with stakeholder groups.

Stakeholders supplied helpful suggestions on the lines of research that should be pursued under various STEP emphasis areas. Many stakeholders completed the entire feedback form, and offered information about other current or planned research projects in particular emphasis areas, suggestions for funding sources or other resources, and general comments about the STEP program.

Note that with regard to potential funding sources or other resources, these suggestions were provided by stakeholders who may have a wide range of experience with or information about these potential sources. STEP program managers and emphasis area contacts have not made funding agreements or arrangements with any of these potential partners. STEP program managers and research coordinators assess the possibility of funding or resource partnerships as various research projects take shape.

**STAKEHOLDER FEEDBACK SUMMARIES BY EMPHASIS AREA**

This section summarizes feedback submitted through August 2007 that pertains to each of the seventeen emphasis areas as well as general feedback on the STEP.

Click on the links below to be directed to a particular emphasis area feedback summary.

**Environment Emphasis Areas:**

- [Air Quality and Global Climate Change](#)
- [Water / Wetlands / Vegetation / Wildlife Habitat / Brownfields](#)
- [Historic Preservation](#)
- [Bicycle / Pedestrian and Health](#)
- [Noise](#)
- [Outdoor Advertising Control / Realty Program Management](#)
- [Environmental Streamlining / Stewardship](#)
- [Context Sensitive Solutions](#)

**Planning Emphasis Areas:**

- [Congestion](#)
- [Safety Planning](#)
- [Freight Planning](#)
- [Public Involvement, Environmental Justice, Visualization in Planning](#)
- [US / Canada and US Mexico Border Planning](#)
- [National Security, Defense, and Interstate Planning](#)
- [Other Activities that Support State/Local/Tribal Planning Capacity Building](#)

**Tools to Support Planning and Environment Emphasis Areas:**

- [Travel Modeling](#)
- [GIS/Spatial Information for Improved Decision Making](#)

**Program Management and Outreach**

- [General Feedback](#)

**Emphasis Areas Related to Environment**

**Air Quality and Global Climate Change**

A total of 17 comments were submitted to the Air Quality and Global Climate Change emphasis area. Approximately 24% of comments came from Tier I stakeholders and 29% of comments came from Tier II, although there were no comments from local governments. Nearly half (48%) of comments came from Tier III, with feedback from national associations, the private sector, research/academic institutions, and other sources. There were no comments from individual citizens to this emphasis area.

Many of the research suggestions in this area focused on improving air quality by reducing vehicle emissions or adopting specific mitigation techniques, such as carbon sequestration along roadside areas or roadside revegetation used for biofuel feedstock production. Many comments focused on the relationship between air quality, congestion, and global climate change. Some suggestions were more technical in nature and included development of new models to assess how climate change affects the transportation sector. Several stakeholders suggested that more research is needed to evaluate the relationship between climate change, transportation standards, and infrastructure (e.g., how an upward trend of severe weather events may stress roads and bridges). Assessing the results of existing congestion- and emission-reduction measures was another area mentioned by a few stakeholders.

Finally, one stakeholder suggested that peer exchanges could be an important way to increase awareness about the relationships between climate change and air quality.

There is some current and planned research in this area, including research conducted by Federal agencies on global climate change. One stakeholder mentioned that there have been several small-scale studies regarding the health effects of emissions gradients along highway corridors. Stakeholders identified several possible funding sources, including US Department of Energy (USDOE), US Environmental Protection Agency (EPA), National Science Foundation (NSF), US Department of the Interior (USDOI), and the Federal Highway Administration (FHWA).

### **Water / Wetlands / Vegetation / Wildlife Habitat / Brownfields**

A total of 94 comments were submitted to this emphasis area. An additional comment was reclassified from the "general" comments area to the Water/Wetlands area for a total of 95 comments. Comments were submitted by stakeholders from all tiers.

Comments focused on several themes, including improving roadway infrastructure (e.g., culvert design) to facilitate wildlife movement and reduce wildlife habitat disturbance, as well as improving water quality of highway runoff. Various techniques were proposed to address highway runoff, including desalinization, installation of bioswales that use native plants, and implementation of new methods to manage turbidity impacts from road construction.

Beyond these themes, there were three major areas of suggestion. The first area focused on how to appropriately manage both roadside plantings and non-native, invasive vegetation species on highway right-of-ways. Stakeholders from all Tiers contributed a wide variety of comments to this area. Comments focused on programs to improve the stability of roadside plant communities (mowing was particularly emphasized as key to roadside plant management), as well as contain or eradicate non-native vegetation. For example, individuals mentioned development of a national invasive species inventory system to improve early detection and rapid response to invasive vegetation, updating training materials on how to safely apply herbicide on highway ROW, and using invasive species as biomass for fuel. Other individuals mentioned research on washing invasive species off vehicles or boats and comparisons of cost-effectiveness of various biological, chemical, and land management techniques for noxious weed control.

A second major area of comment was that of improving highway safety by addressing wildlife and vehicle collisions; one specific topic proposed for research by a Tier II stakeholder was eliminating alfalfa, a food source for deer, from road ROWs to determine whether this elimination would decrease collision incidents. Other suggested lines of research included a driver simulation study to focus on optimal spacing of animal crossing warning signs along the highway, development of training materials and best practices for wildlife habitat management near roadways, and studies on wildlife hotspots along transportation corridors.

A third major area of comment was on better prediction models, processes, policies, or regulations to guide interactions between transportation planning, habitat, and wildlife. For example, one stakeholder from Tier I suggested research on models that can help better assess the wetland impacts of highways. Another stakeholder recommended a survey of all fifty states to evaluate policies and standards that influence the successful implementation of wildlife mitigation measures. Several individuals mentioned the need for better vegetation or habitat inventories to facilitate environmentally sensitive transportation planning. A Tier III partner suggested development of workshops or training manuals to improve coordination between state DOTs and conservation agencies on long-term wetland mitigation.

Updating and improving databases to better manage environmental information was another related theme in this area; for instance, stakeholders commented on the need to update the Stormwater Best Practices Database and Wildlife Crossings Toolkit, among others.

Current or planned research in this area generally related to the topics mentioned above as well as others. Some additional topics for current and planned research included development of biomarkers of environmental stress for fish and invertebrates, biocontrols for invasive species, a literature review of pollutants in highway runoff, a pilot program for using GPS to manage invasives, and pre-and post-construction monitoring of wildlife crossings. Many stakeholders mentioned that research had taken place on a local level or on a limited basis, but that there was a continued need to make research more multi-disciplinary and broaden efforts to a statewide or regional level.

Funding sources included Federal and/or State agencies, such as the U.S. Department of Agriculture (USDA), the U.S. Army Corps of Engineers (ACOE), the Environmental Protection Agency (EPA) the U.S. Geological Survey (USGS), the National ANASA, National Science Foundation (NSF), State Departments of Transportation (DOTs) and State Fish and Wildlife agencies. Non-governmental organizations cited as potential funding sources included The Nature Conservancy, the National Wildlife Federation, and the Conservation Fund. Other potential sources included State environmental councils, metropolitan planning organizations (MPOs), railroad companies, and insurance companies.

### **Historic Preservation**

Thirteen comments were submitted to this emphasis area. One comment was from Tier I, seven comments were from state or local government stakeholders (Tier II), and five comments were from Tier III.

Comments focused on a few major areas, including studies of various types of structures to facilitate historic preservation or context sensitive design. Several stakeholders commented on historic bridges, suggesting development of preservation-oriented specifications and comprehensive studies on bridge maintenance plans. Another individual from Tier II suggested research on the impact of seawalls on coastal archaeological sites. A related comment from Tier II recommended a study on historic streetlights in one region of the U.S. to ensure that ongoing enhancement projects were context sensitive.

Another major area of comment was on developing best practices, case studies, models, or other tools to help improve historic preservation consulting, decision making, and management. A number of stakeholders from all Tiers contributed to this area. Finally, several stakeholders mentioned use of GIS to improve early planning and consultation with affected agencies, communities, and tribes. A few stakeholders specifically mentioned development of a GIS-based research database to accomplish these goals.

Current and planned research related to this emphasis area included studies on the effectiveness of Ground Penetrating Radar (GPR) to determine presence of subsurface historic sites, several independent statewide efforts to assess bridge preservation, and a pilot study of marine coastal archaeological sites. A Tier II stakeholder also mentioned planned research to build a geographic database of archaeological site information. Potential funding sources included SHPO office, the National Trust, and the National Park Service (NPS). In addition, stakeholders mentioned potential funds from U.S. Department of Transportation (DOT), AASHTO, the Transportation Research Board (TRB), State Planning and Research (SPR) and National Cooperative Highway Research Program (NCHRP) 25-25.

### **Bicycle / Pedestrian and Health**

Stakeholders submitted a total of 12 comments to this emphasis area. Federal partners (Tier I stakeholders) submitted one comment, and Tier II stakeholders submitted four comments. Tier III stakeholders (including individual citizens, national association representatives, research/academic institutions, and other sources) submitted the majority of comments (approximately 58 percent). There were no comments from the private sector.

Most comments to this emphasis area focused on improving data collection and increasing research on bicycle and pedestrian behavior, demographics, bike path and sidewalk use, and safety. The ability to effectively measure pedestrian and bicycle safety was also mentioned. Several stakeholders specifically commented that research should focus on assessing relationships between bicycle travel and congestion relief and the impacts of the built environment on transportation mode choice. One stakeholder suggested increasing research to determine the effectiveness of pedestrian safety measures along grade crossings. Another stakeholder mentioned that more research should be conducted regarding traffic and engineering improvements that could be made to meet the needs of children who walk or bike to school. Finally, several stakeholders suggested that increased funding is needed to more comprehensively address bicycle and pedestrian transportation research.

There is some current and planned research in this area, including a benchmarking study that compiles data on bicycling and walking mode share and demographics, a study on the Safe Routes to School program, studies on trail use and development, and research on bicycling demand. Stakeholders suggested funding models that could include public/private partnerships. Few funding sources were identified, but one included state transportation research funding or grants from private foundations. One stakeholder from Tier II suggested that closer coordination between FHWA and the Center for Disease Control (CDC), US Department of Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA) is needed to address the goals of the STEP program.

### **Noise**

Sixteen comments were submitted to this emphasis area. Two of the comments came from stakeholders affiliated with the Federal government (Tier I), eight comments came from state government (Tier II), and four came from the private sector (Tier III). One comment was from a national association (Tier III) and one comment was from some "other" affiliation. There were no comments from local government, the research/academic community, or individual citizens.

Comments focused on improving noise modeling and prediction, especially regarding enhancements to the Traffic Noise Model (TNM) and Roadway Construction Noise Model (RCNM). A few individuals identified several current inadequacies related to the TNM and specifically suggested research that would update and improve this model. Another stakeholder suggested that research identify intelligent noise abatement strategies that factor in permanent and temporary traffic conditions. Finally, one individual suggested improving the accuracy of day and night truck percentages used in traffic noise models.

A second recurring theme in stakeholders' comments was investigating the effects of noise levels on people, animals, and communities. For example, several stakeholders recommended enhancing research on noise levels for construction equipment and multimodal transportation. Along these lines, a Tier I partner recommended a study of the growing trend towards quiet cars, pavement, and tires, and this trend's effect on people who rely primarily on auditory (rather than on visual) cues to navigate

roads. In addition, a Tier II stakeholder recommended looking at how underwater noises associated with highway construction (e.g., pile driving) affects marine life. Finally, comments focused on streamlining safety planning and noise reduction, perhaps by using construction materials that could improve both at the same time, and investigating how noise barriers affect real estate values.

There is some current and planned research in this area. For example, stakeholders mentioned development of comprehensive noise models including environmental noise and a small-scale study to develop measurements for rumble strip grinding noises. Others mentioned ongoing research on lowering pavement noise levels and using low-noise pavements for specific climates, as well as a recent effort on a broader level to focus on lack of sound cues from hybrid vehicles. Finally, a Tier I stakeholder mentioned current development of the Federal Highway Administration (FHWA) TNM version 3.0.

Funding sources included Federal entities such as FHWA, city or State environmental departments, other sources from the public and private sectors, or pooled fund studies supported in part by State Departments of Transportation (DOTs). State planning and research (SPR) funds were mentioned as another potential source.

### **Outdoor Advertising Control / Realty Program Management**

A total of thirty-four comments were submitted to this emphasis area. Five of the comments came from stakeholders affiliated with the Federal government (Tier I) and six comments came from State government (Tier II). Tier III stakeholders submitted twenty-three comments. There were no comments from local government, the research/academic community, or individual citizens.

A large number of stakeholders from across all Tiers suggested holding peer exchanges to discuss various aspects of outdoor advertising and realty programs, including the use of incentive payments in Right of Way (ROW) acquisitions or other compensation for relocation assistance. Along these lines, stakeholders mentioned several kinds of outreach events, such as national conferences and symposia, to help disseminate best practices and lessons learned related to outdoor advertising regulation and asset management.

Several comments suggested reviewing Federal legislation, such as the Bonus Act and Uniform Act, to ensure the efficacy, competency, and streamlined administration of these regulations. In addition, stakeholders suggested studies related to the effects of these policies. For example, a Tier III partner recommended an investigation into the continued viability of businesses displaced by property acquisitions. Other Tier II and Tier III stakeholders suggested research on ROW acquisition and relocation trends and issues, especially those relating to equity. For example, one comment from Tier III focused on evaluating replacement housing benefits, especially in states with a high percentage of retirees or elderly on fixed incomes. Finally, another theme across all Tiers was that of streamlining: stakeholders suggested that research could be conducted on acquiring ROW from property owners and utility companies at the same time, or conducted on a cost-benefit analysis of obtaining partial acquisitions prior to mortgage closings.

Stakeholders mentioned some current activities related to this emphasis area, including ongoing educational events such as annual symposia that focus on ROW practitioners. The 2008 Public Real Estate Education Symposium (PRES) was mentioned several times as a key outreach and educational event. There were few current research projects mentioned, which included eye motion studies to determine the effect of outdoor advertising on driver distraction and a survey sent to State ROW directors to assess changes in eminent domain law.

Cited funding sources included Federal agencies (e.g., FHWA and FTA), AASHTO, the American Bar Association, the National Cooperative Highway Research Program (NCHRP), the Outdoor Advertising Agency of America (OAAA), and Scenic America. Stakeholders also mentioned other possible funding sources, such as public-private partnerships with agencies like the National Association of Highway Billboard Advertisers.

### **Environmental Streamlining and Stewardship**

A total of fifteen comments were submitted to this emphasis area. Eight comments were submitted by stakeholders affiliated with Federal (Tier I) and state agencies (Tier II). Seven comments were submitted by Tier III, including national associations, the private sector, the research/academic community, and other affiliations. There were no comments from local government or individual citizens.

Most suggested research was related to environmental or conservation streamlining as well as improving process and regulatory efficiencies in transportation planning. One Tier I partner suggested developing a toolkit to share collaborative invasive species prevention practices between road crews and natural resources managers. A Tier I stakeholder suggested aligning Federal and State environmental databases to streamline environmental reviews for transportation projects. Another Tier I stakeholder suggested establishing joint cooperative agreements between State Departments of Transportation (DOTs) and resource agencies to share regulatory and permitting best practices.

Ongoing and current research related to this emphasis area included an academic pilot study on using forest wastes as a potential ethanol feedstock, environmental programs that encourage road-user participation, and the Nature Conservancy's development of eco-regional plans that may be useful for environmentally-conscious transportation planning. Stakeholders also mentioned programs or publications such as the Green Highways Partnership, Green Infrastructure, Eco-Logical, and Environmental Competency Building as models for integrating planning with conservation.

Suggested funding sources included the Environmental Protection Agency (EPA), the National Cooperative Highway Research Program (NCHRP), agencies such as the U.S. Fish and Wildlife Service (USFWS) or the National Park Service (NPS), trade groups, and private environmental organizations (e.g., the Plant Conservation Alliance). One Tier I stakeholder mentioned that DOT project-related funding could be used for training resource agencies in integrating conservation with transportation planning.

### **Context Sensitive Solutions**

Seven comments were submitted to this emphasis area. Two comments came from stakeholders affiliated with Federal agencies (Tier I) one comment was from state government (Tier II), and four comments came from Tier III. The remaining two comments came from 'other' sources. There were no comments from local governments, individual citizens, the private sector, or research/academic institutions.

Comments focused on several areas, including the benefits and limitations of CSS for conservation, and use of CSS to address green infrastructure development and hazardous waste dumping on public assets. One Tier III stakeholder suggested that research be conducted on effective implementation of "complete streets" policies and how these policies interact with CSS programs. A stakeholder commenting on how CSS could address conservation recommended a cost-benefit analysis of environmental avoidance versus mitigation approaches for transportation projects. Another area

mentioned by a Tier II partner was to define performance measures for CSS processes and outcomes in order to fully institutionalize CSS.

Stakeholders noted that current research includes studies on complete streets policies by advocacy groups as well as at the local and regional levels, and an ongoing TRB study related to quantifying CSS benefits. A Tier III stakeholder cited a planned study on making green infrastructure a component of green highways. Stakeholders cited a few potential funding sources, such as private foundations, the National Cooperative Highway Research Program (NCHRP), and Federal agencies (e.g., EPA).

## **Emphasis Areas Related to Planning**

### **Congestion**

A total of seven comments were submitted to this emphasis area. Approximately 29% of comments came from Tier I stakeholders and 57% of comments came from Tier II stakeholders. Only one comment came from a Tier III stakeholder, who is a national association representative. There were no comments from local government, individual citizens, the private sector, research/academic institutions, or other sources.

Several research suggestions focused on multimodalism, including conducting regional and corridor modeling to support multimodal corridor system management planning and analysis. Other suggested lines of research involved investigating both recurring and non-recurring congestion, and convening peer exchanges to develop stronger access management policies that could reduce congestion. A Tier II partner recommended that research be conducted to explore intersections between environmental justice issues and congestion pricing and tolling. Another Tier II partner suggested research into establishing priorities for multi-modal capacity building.

Little current or planned research was cited in this emphasis area, but Tier II stakeholders mentioned current programs to address congestion and early corridor planning, as well as efforts to develop bi-state/statewide truck travel time estimates and truck traffic volumes. Stakeholders mentioned Departments of Transportation (DOTs) as potential funding sources, but did not identify any other funding source.

### **Safety Planning**

Seven comments were submitted to this emphasis area. Three of the comments (43%) came from stakeholders affiliated with Tier II; four comments came from Tier III partners. Out of comments submitted by Tier III, one was from a national association, another from the research/academic community, and two comments were associated with stakeholders from an "other" affiliation. There were no comments from Federal or local government, the private sector, or individual citizens.

Comments generally focused on mitigating wildlife-vehicle collisions, streamlining safety planning within completed highway projects, and safety planning for freight truck operations. Three Tier III stakeholders mentioned mitigation of wildlife-vehicle collisions as a major way to improve highway safety. One suggested line of research was to investigate and map intersections between natural wildlife habitat and transportation corridors in order to improve crossing structures. Similarly, another Tier III stakeholder suggested that funding be provided to standardize animal-vehicle collision data across state agencies. The standardized data would help ensure that project managers access consistent information and facilitate mapping of animal-vehicle collision 'hot spots.' Two comments focused on streamlining safety planning for highway projects; for instance, one suggestion was to use specific raw materials in highway

construction that could both improve vehicle safety and address wildlife crossings. Comments related to freight truck operations included suggestions for evaluating the safety of high speed intersections, investigating truck driver shortages and turnover, and assessing the need for random trailer inspections in tandem with random truck inspections.

There were a few current or planned research studies in this emphasis area. One study involves an investigation of truck and trailer safety for trucks that cross the U.S.-Mexico border. Another project involves statewide assessments of highway wildlife-vehicle collision 'hot spots' in 11 states. Potential funding sources included Federal agencies, State Departments of Transportation (DOTs), insurance companies, or organizations such as AASHTO. Other suggested sources were matching funds between State and Federal agencies or multi-agency funding.

### **Freight Planning**

Ten comments were submitted to this emphasis area. The comments were submitted by stakeholders affiliated with Federal, state, and local agencies, national associations, the private sector, and "other" affiliation. 30% of comments came from Tier I, 60% of comments came from Tier II, and 10% of comments were from Tier III. Overall, there were no comments from the research/academic community or the private sector.

Comments focused on three major areas. The first area included research to make freight movement more efficient and safer, especially by improving freight infrastructure, security, and streamlining freight operations. To improve freight efficiency and safety, one stakeholder suggested that research focus on identifying and addressing regional freight bottlenecks; another Tier II partner recommended studies that focus specifically on improving operator, cargo, and conveyance safety.

The second area was on collecting data and conducting data analyses to improve freight planning. For instance, a Tier I stakeholder suggested research on installing data loggers in tractor-trailers that could record a range of information related to freight movement. This information could be used to develop a statistical scoring system to relate freight truck driver behavior to fuel economy and safer driving practices.

Finally, a third area of stakeholder comments was on geographic analyses of freight movement that could help reduce highway vehicle miles travelled (VMT) or evaluate the potential of trade growth due to new freight corridors. Comments related to this area specifically mentioned research that could assess freight movement along individual interstate routes and investigate potential shifts from one international freight corridor to another in specific regions of the U.S.

Current and planned research includes economic assessments of freight transportation, work by the Environmental Protection Agency's (EPA) offices on developing heavy-duty fuel economy test methods, some preliminary literature reviews related to shipping corridors, and cost-benefit analyses of various corridors. Funding sources included the Federal Highway Administration (FHWA), state Department of Transportation (DOT) funds, and matching funds with national research institutes such as the National Center for Freight and Infrastructure Research and Education (C-FIRE) or the Great Lakes Maritime Research Institute (GLMRI).

### **Public Involvement, Environmental Justice, and Visualization in Planning**

Four comments were submitted to this emphasis area. Two comments came from stakeholders affiliated with state government (Tier II) and two comments came from the research/academic

community (Tier III). There were no comments from Federal or local government, national associations, the private sector, individual citizens, or “others.”

Stakeholders suggested a range of research, including an analysis of toll projects on environmental justice (EJ) populations, as well as an investigation of topics that could link Federal, State, metropolitan, and local planning efforts and increase inter-governmental collaboration. Tier II stakeholders suggested research on approaches to develop, analyze, and display ‘impact’ contours and categorize zones of highway system performance, as well as research on modal choice distortions resulting from policy inequities.

Tier III stakeholders mentioned two current research projects, both of which related to EJ. One project involved multi-agency efforts to assess the effect of toll systems on EJ populations. Another project focused on implementation of EJ and public involvement processes at the metropolitan level and how funding considerations may be a factor in implementation. Tier III stakeholders also mentioned several funding sources, including joint funding through Federal agencies, such as the Environmental Protection Agency (EPA) or the Federal Transit Administration (FTA), or with metropolitan planning organization (MPOs) or Councils of Government (COGs). Tier II stakeholders did not mention any current research or funding sources related to this emphasis area.

#### **US/Canada and US/Mexico Border Planning**

Two comments were submitted to this emphasis area. The comments were submitted by stakeholders affiliated with a Federal agency and a national association.

The comment submitted by the Tier I stakeholder focused on development of a pilot project to explore bi-national financial feasibility or preliminary investment-grade financing for land port of entry improvements at either the US/Canada or US/Mexico border. This stakeholder mentioned that the objective of such a pilot program would be to better coordinate and align inter-governmental transportation planning. The Tier III stakeholder suggested that data be collected regarding vehicle wait times at land ports of entry to reduce congestion in these areas.

Stakeholders identified several current projects in this area, including inter-governmental financial feasibility studies and partnering efforts with the private sector to gather vehicle wait time data. A few funding sources were mentioned, such as leveraging funding through state Departments of Transportation (DOTs) or the private sector, and using Federal credit assistance programs.

#### **National Security, Defense, and Interstate Planning**

A total of two comments were submitted to this emphasis area. Both comments were submitted by Tier II stakeholders affiliated with state agencies.

Stakeholders suggested research on the multimodal efficiency impacts of transportation security systems and on meeting national security data needs while improving data for freight analysis. One stakeholder also mentioned investigating ‘risk zones’ where security breaches could affect transportation infrastructure.

Stakeholders did not mention any current or planned research in this area. State Departments of Transportation (DOTs) were mentioned as a possible funding source.

### **Other Activities that Support State/Local/Tribal Planning Capacity Building**

Six comments were submitted to this emphasis area. Five comments were submitted by stakeholders representing national associations (Tier III); one comment was submitted by a Tier I stakeholder.

Comments focused on improving methodologies and models for aligning transportation data, technology, and investments with business priorities and strategic emphasis areas. Stakeholders specifically suggested capacity building workshops as ways to facilitate communication between transportation agencies on these topics. Some of the anticipated results of such workshops included improving forecasting models, sharing lessons learned on cost management, and learning how to maximize system performance through transportation asset management. In addition to these comments, a Tier III stakeholder recommended that more research is needed to evaluate the most efficient and effective ways to share knowledge among state DOTs.

Stakeholders mentioned several current and planned research topics. For example, several State transportation agencies have initiated independent research projects to strengthen cost estimating and cost management efforts. In addition, a peer exchange sponsored by the Transportation Research Board (TRB) Asset Management Committee is planned to discuss open architecture for data integration. The Federal Highway Administration (FHWA), TRB, and AASHTO are also engaged in a number of transportation asset management-related research activities, included development of performance measures for states regarding specific asset classes.

Suggested funding sources included the AASHTO Standing Committee on Planning (SCOP), TRB, and the National Cooperative Highway Research Program (NCHRP). One individual mentioned potential opportunities to partner with TRB and/or the Association of Metropolitan Planning Organizations (AMPO) on capacity building research.

### **Emphasis Areas Related to Tools to Support Planning and Environment**

#### **Travel Modeling**

Seven comments were submitted to this emphasis area. Comments were submitted by stakeholders affiliated with Federal and state agencies, as well as the research/academic community. There were no comments from local government, the private sector, national associations, individual citizens, or "others." Two of the comments came from stakeholders affiliated with the Federal government; four comments came from state government, and one comment came from the research/academic community.

Comments focused on improving statewide and national travel models. Stakeholders specifically suggested developing new modeling approaches that are better suited for multimodal investment analyses, complex planning issues, environmental assessments, and evaluations of a broad range of policy alternatives. Several individuals mentioned research on aggregation issues, commercial trip generation in urban areas, and heavy-duty truck activity to improve and expand travel modeling. Additional comments from Tier I and Tier II partners mentioned studies related to the impact of freight on infrastructure fatigue and better methods for allocating statewide vehicle miles traveled (VMT).

Current and planned research included state DOT-initiated studies on integrated land use, economic, and transportation models. Also cited was a study to assess the state of the practice on the ability of local-level models to effectively analyze land use plans with an emphasis on 'smart growth' strategies.

Stakeholders identified some potential funding sources that included FHWA and state DOTs. FHWA's State Planning and Research funds also partially supported several current and planned studies.

### **GIS and Spatial Information for Improved Decision Making**

A total of 13 comments were submitted to this emphasis area. Two comments were submitted by Tier I Federal partners. Three comments were submitted by Tier II State and local partners. Seven comments were submitted by Tier III and included feedback from two national associations, the research/academic sector, and the private sector. There were no comments from the research/academic community or the private sector. Finally, one comment was submitted as 'other.'

Most comments focused on the ability of geographic information systems (GIS) to enhance the transportation planning process, especially in regard to improved decision making. For example, one Tier III partner suggested that GIS could be used to analyze road expansion projects to identify key wildlife crossings and mitigate wildlife mortality. Another Tier III stakeholder mentioned development of peer exchanges or outreach events to share best practices and research ideas in this emphasis area. Other comments from Tiers II and III primarily dealt with the contribution of GIS to forecasting studies, mapping wildlife habitat assessments, or highway maintenance. Another stakeholder suggested that all data layers required for planning, such as ecosystems and habitat information, be available to all State Departments of Transportation (DOTs) and the public as GIS shape files. This stakeholder also mentioned that GIS shape files could be used to improve geospatial analysis of land-use scenarios and transportation expansion.

There is some current and planned research in this area, especially on the efficacy of wildlife crossings, integrating wildlife crossing information into transportation planning, and establishing data baselines to reduce redundancies. Other research includes integration of spatial data into transportation project management and a study on the utility of different types of GIS equipment in various daily work environments. Few funding sources were identified, but stakeholders mentioned the Federal Highway Administration (FHWA), non-governmental organizations (NGOs), and the Wildlife Conservation Society as a few possibilities. One stakeholder also mentioned state and Federal matching funds.

### **General Program Management and Outreach**

Eight comments were submitted to the "General" stakeholder feedback category. One comment was submitted by a Tier I stakeholder, four comments were submitted from Tier II stakeholders, and three comments were submitted by Tier III stakeholders who were affiliated with national associations, the research/academic sector, or had no affiliation (i.e., were individual citizens).

Comments focused on a wide spectrum of topics, including utilization of technology to provide road and regional information to travelers and research on mitigating snowmobile damage to road pavements. Another Tier II stakeholder suggested research related to arsenic exposure on railroad right-of-ways (ROW) being converted to recreational trails. Finally, one individual from Tier II recommended developing comprehensive, geospatially-based, site-specific models or databases that consider early road and trail building in addition to more contemporary efforts.

Current and planned research in this area included efforts to assemble digitized, geospatially-referenced information on landscapes and transportation histories for a county-wide area, early development of audio and visual information regarding regional histories that could be provided to travelers, and development of a guidebook for watershed-based stormwater management. In addition, one

stakeholder mentioned a multi-year study on the effect of snowmobiles on various types of pavement mixes.

Stakeholders mentioned a few potential funding sources, such as the National Park Service (NPS), state Departments of Transportation (DOTs), and other non-governmental entities that might include humanities, historic preservation, and natural resource interest organizations.