Statement of
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Chairman Wu, Ranking Member Gingrey, and Members of the Subcommittee, thank you for the opportunity to testify today about the Federal Highway Administration's (FHWA) efforts to advance environmentally sensitive transportation infrastructure. FHWA is fostering a continued shift in the focus of the highway community from simply mitigating environmental impacts to actively contributing to environmental improvements. In fulfilling this responsibility, we work closely with our partners at the Federal, State, and local levels to provide a coordinated national research agenda and deliver research results through training and technical assistance

Following the direction provided by the National Environmental Policy Act (NEPA), FHWA and the State departments of transportation (DOTs) have become proactive partners in the environmental area. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) expanded the focus of environmental considerations from project development, construction, and operations, to the area of transportation planning. SAFETEA-LU also contains a number of provisions to improve coordination between transportation and resource agencies. Minimizing damage from, and mitigating negative impacts of, transportation facilities on the human and natural environments are always significant considerations for every Federal-aid funded highway project, from the initial planning and design stages, through development and construction, to operation and maintenance.

Our State partners are learning from experience that introducing environmentally sound technologies and construction practices early in project development can produce savings in costs and in time to completion, and can reduce future remediation expenses. FHWA and its partners have made substantial contributions to the natural environment and to communities, through planning and programs that support context sensitive solutions, stormwater management, beneficial reuse of industrial byproducts materials, wetland banking, habitat restoration, historic preservation, air quality improvements, bicycle and pedestrian facilities, wildlife crossings, and public and tribal government involvement in transportation project development.

FHWA will continue to support these programs while it also works with State, local, and Federal partners to conduct sound environmental reviews in a timely way. With prompt decision-making, we routinely reduce project cost escalation, ease congestion, and deliver the transportation and safety improvements that the American public expects.

Research Programs for Environmentally Sound Practices and Technologies

Working with its partners, FHWA supports a research and technology program that is focused on developing and implementing an environmentally sensitive transportation program.

State Planning and Research (SP&R) Program. Section 505 of title 23, United States Code, requires that States set aside 2 percent of the apportionments from the Interstate Maintenance, National Highway System, Surface Transportation, Highway Safety Improvement, Highway Bridge, Congestion Mitigation and Air Quality Improvement, and Equity Bonus programs for State planning and research activities. Of this amount, States must allocate 25 percent for research, development, and technology, unless the State certifies that transportation planning expenditures will require more than 75 percent of the amount set aside. In fiscal year 2006, the set aside amounted to almost $600 million and, thus, provided almost $150 million for the State Planning and Research (SP&R) Program. SP&R-funded activities involve researching new areas of knowledge, adapting findings to practical applications by developing new technologies, transferring the technologies, and training the users of the technologies.

The SP&R Program is intended to solve problems identified by the States. State DOTs are encouraged to establish research, development, and training programs that anticipate and address transportation concerns before they become critical problems. Each State must implement a program that ensures effective use of available SP&R funds on a Statewide basis, and each State is permitted to tailor its program to meet local needs. High priority is given to applied research on State or regional problems, transfer of technology from researcher to user, and research for setting standards and specifications. Major research and development areas include infrastructure renewal (including pavement, structures, and asset management); activities relating to safety, operations, and management; environmental and real estate planning; and policy analysis and systems monitoring.

State DOTs have used SP&R funds for substantial research into regional stormwater issues and development of best management practices suitable for the particular issues in that locality or State. An example of ongoing research related to stormwater at the State level is an "Investigation of Stormwater Quality Improvements Utilizing Permeable Pavement and/or Porous Friction Courses," which is being sponsored by the Texas DOT using SP&R funds.

Surface Transportation Environment and Planning Cooperative Research Program (STEP). At the national level, FHWA currently administers environment and planning research funds under the STEP program created by SAFETEA-LU in section 5207. STEP is intended to improve understanding of the complex relationship between surface transportation, planning, and the environment. The program is authorized at $16.875 million per year for fiscal years 2006 through 2009.

Current initiatives propose research in areas related to planning, air quality, noise abatement, wetlands, vegetation management, wildlife connectivity, brownfields, and stormwater. Some specific stormwater initiatives are the International Stormwater Best Management Practices Database, Evaluation and Update of FHWA Pollutant Loadings Model for Highway Stormwater Runoff, and Synthesis on the Fate and Effects of

Chloride from Road Salt Applied to Highways for Deicing. Other proposed research would examine tools such as Geographic Information Systems (GIS) and Global Positioning Systems (GPS) to better map important ecosystem features, including wildlife corridors and invasive plants, to improve our ability to recognize and address environmental concerns very early in the process of planning a project.

Center for Environmental Excellence. In section 5309, SAFETEA-LU authorizes $1.25 million per year for fiscal years 2006 through 2009 to establish a Center for Environmental Excellence to provide technical assistance, information sharing of best practices, and training in the use of tools and decision-making processes that can assist States in planning and delivering environmentally sound surface transportation projects. FHWA is currently reviewing proposals from universities and expects to announce the establishment of the new Center for Excellence shortly.

Infrastructure Research and Technology. FHWA's infrastructure research and technology programs also pursue initiatives with potential environmental benefits, including:

- Cantilever construction of bridges, which keeps construction equipment out of the waterway.
- Prefabricated technologies for construction and repair of infrastructure (bridges and pavements) and other accelerated construction technologies which reduce environmental impacts by (a) moving much of the construction process to controlled environments and (b) reducing the duration of damaging activities.
- "Warm mix" technology for asphalt paving which reduces the temperature at which asphalt paving materials are manufactured and placed, thereby reducing both emissions and fuel consumption. This technology also has the potential to increase the amount of recycled asphalt pavement that can be effectively used in the paving mixture.

FHWA promotes and supports the use of recycled materials in highway construction and, through our contractor, the Recycled Materials Resource Center, currently at the University of New Hampshire, we are making changes in the extent of use of several industrial by-product materials in highway construction. FHWA also has an active Recycling Team that works with the States, the Environmental Protection Agency (EPA), and industry to implement recycling technology.

Funding for these initiatives comes from several sources, including the Innovative Pavement Research and Deployment Program and the Innovative Bridge Research and Deployment Program. The Highways for LIFE program will also contribute to implementation of these technologies.

Research Coordination, Training and Technical Assistance, and Partnerships

Coordination. As more transportation and environmental research is being undertaken by a diverse array of organizations, there is a growing need for organized approaches that support well-crafted research agendas. FHWA hosts, funds, or participates in various research coordination efforts. FHWA's STEP program is a cooperative research program, and stakeholders were extensively engaged in defining the

research agenda and identifying focus areas and projects. In addition to FHWA's STEP program, National and State-level research programs of particular interest to State DOT transportation and environmental practitioners include the Strategic Highway Research Program Two (SHRP-2) led by the Transportation Research Board (TRB); the National Cooperative Highway Research Program (NCHRP) research programs, including the 25-25 research initiative, which provides funding for quick turnaround research by American Association of State Highway and Transportation Officials' (AASHTO) Standing Committee on Environment; individual State DOTs' research programs, which increasingly include environmental components that are often conducted in coordination with university partners; and university research, particularly practitioner-oriented research conducted by University Transportation Centers around the nation that receive funding authorized under SAFETEA-LU.

An additional key area of investment is the AASHTO Center for Environmental Excellence Transportation Environmental Research Ideas (TERI) Database. TERI is a dynamic tool that helps practitioners keep track of and prioritize constantly evolving transportation and environmental research needs.

Training and Technical Assistance. Important components of a coordinated research agenda are training and technical assistance. FHWA is working with our partners at all levels to share research results and promote environmentally sound practices.

The FHWA's National Highway Institute (NHI) has developed courses addressing environmental issues associated with infrastructure construction, operation, and maintenance, including a number of courses relating to water quality and runoff. Development of courses in these areas is coordinated with the appropriate Federal agencies--most often EPA, the United States Army Corps of Engineers, and the United States Fish and Wildlife Service (USFWS)--and with representatives of State DOTs. Courses include "Design and Implementation of Erosion and Sediment Control," "Water Quality Management of Highway Runoff, and "Managing Road Impacts on Stream Ecosystems: An Interdisciplinary Approach." Attached to this statement is a summary of research related to stormwater runoff, directly carried out, funded, or supported by FHWA, which provides additional information on these courses. (See Attachment - "Status of Current FHWA Water Quality Research.")

FHWA will be developing a NHI short course entitled "Environmental Factors of Construction and Maintenance." The course is intended to familiarize construction teams with environmental concerns to be addressed as part of construction and maintenance operations. The scope of work for the training has been prepared, and a request for proposals will be issued shortly. This is the latest of several courses developed and offered by FHWA's NHI relating to water quality and runoff. The Attachment also includes additional information on this course.

Technical assistance is also available through FHWA's Resource Center technical teams and through the Local Technical Assistance Program (LTAP) and Tribal Technical Assistance Program (TTAP). The latter two organizations represent 58 centers that work directly with local agencies to transfer technology and train practitioners at city, town, county, and tribal levels.

In addition, FHWA has developed case studies to showcase best practices or innovative techniques. Transportation enhancement funds have often been used for projects that improve the quality of highway stormwater runoff. The Sebago Lake-Route 35 Environmental Mitigation in Standish, Maine; the Santa Monica Urban Runoff Recycling Facility; and the Rock Creek Watershed Restoration, Montgomery County, Maryland, are three examples of such projects showcased on our transportation enhancements website.

We also showcase important water quality improvement projects or mitigation measures in our Environmental Excellence Awards Program and our Exemplary Ecosystem Initiatives. An example is the Berthoud Pass Mountain Access Project in Colorado. This project received the 2005 Environmental Excellence Award for Roadside Resource Management and Maintenance. Prior to this project, the sediment and de-icing materials needed for safety considerations on US. Highway 40, as it passed through the mountains in northwest Colorado, were pushed into the forest floor causing streams to fill up and clogging pipes. Now, when Colorado DOT maintenance crews plow the highway in the winter, snow and sand travel through a sophisticated system of culverts and ditches to collect in a strategically placed concrete storage basin. Once in the basins, the sand is allowed to settle out and clean water is released into the watershed below the highway. Colorado DOT crews then recover the sand from sloped access ramps, and the process begins again.

Partnerships. FHWA has actively supported a multi-agency effort to develop a non-prescriptive approach to making infrastructure more sensitive to wildlife and ecosystems through greater agency cooperative conservation. The collaborative ecosystem approach to transportation development is described in "Eco-Logical: an Ecosystem Approach to Developing Infrastructure Projects." FHWA currently has dedicated $1 million for grants to transportation agencies, local governments, non-governmental organizations, and others to advance pilot projects based on Eco-Logical and integrated planning principles. Integrated planning is a process for the collection, sharing, analysis, and presentation of data contained in agencies' plans--conservation, watershed, historic preservation, transportation, and others--to more comprehensively address the multiple needs of an area. The solicitation for these grants is expected to be posted at http://www.grants.gov/ and several FHWA websites in the next few days.

National Partnerships are also being promoted through workshops on Linking Conservation and Transportation Planning and Project Development. Pilot workshops were held last year in Arizona, Colorado, and Arkansas. The workshop content is being updated and workshops will be offered again in fiscal year 2008. The purposes of the workshops are to (1) facilitate the exchange of ideas, concepts, and methods for better collaboration between transportation and conservation planning practitioners and (2) promote the sharing of conservation and transportation geospatial data, methodologies, and tools to advance planning, environmental stewardship, and streamlining goals. The primary audience for the training will be conservation and transportation planning and project review/development staffs at the Federal, State, regional, and local levels.

FHWA is also becoming an active participant in the Green Infrastructure Planning Workshops developed by a number of resource and regulatory agencies in cooperation with the Conservation Fund. Green infrastructure relates to a strategic approach to

conservation that promotes planning, protection, restoration, and long-term management that is proactive, systematic, holistic, multifunctional, and science-based. Green Infrastructure workshops approach transportation planning as a way of promoting integrated planning principles. FHWA has provided funding support for Green Infrastructure Workshops held recently in Anchorage, Alaska, and Colorado Springs, Colorado.

FHWA has been a leading partner in the Mid-Atlantic Green Highways Partnership (GHP). The GHP is a public-private initiative that seeks to revolutionize the manner in which our nation's transportation infrastructure is planned and constructed. The GHP promotes integrated planning, regulatory flexibility, and market-based rewards. The GHP provides State DOTs an opportunity to highlight good environmental practices already underway and encourages additional innovations. FHWA has contributed significant resources towards the partnership including staff time, monetary commitments, and technological expertise. Recently, FHWA and EPA co-founded a Green Highways Partnership grant for innovative watershed management projects within the Anacostia Watershed. The grant, announced on Earth Day 2006, awarded a total of $1 million to three different groups working on projects designed to protect and restore urban water resources through a holistic watershed approach to managing water quality. The grant supports Low Impact Development and restoration work in the Anacostia River watershed. This partnership represents significant leveraging of public, private, and non-profit resources, while playing a pivotal role in advancing environmental results; safe, sustainable transportation systems; and economic competitiveness in and around the Anacostia watershed in D.C. and Maryland.

Another recent event was a GHP workshop with Maryland that reviewed a project in the early Environmental Impact Statement stage to discuss stormwater management, conservation practices, and recycle/reuse of industrial byproducts, with a focus on what can then be used in the construction plans for the project.

In addition to work on stormwater runoff management, FHWA is collaborating with the multi-disciplinary, interagency teams of the GHP in the following areas:

Recycling and Reuse. Recycling of industrial byproducts and their reuse as materials for infrastructure construction can not only reduce a wide range of environmental impacts (conserve landfill, reduce water/air pollution, reduce greenhouse gases), but can also save energy, money, and conserve non-renewable resources. The GHP recycling and reuse team has a number of efforts underway, primarily to overcome informational barriers. After identifying and evaluating existing environmental regulations and construction/material specifications, the team will develop guidance documents for State and local agencies on the best methods and specifications for the use of industrial byproduct materials in road and bridge construction. The team will also produce a comprehensive toolkit that provides technical information and guidance to help DOTs and regulatory agencies overcome barriers.

Another GHP priority is to highlight existing State DOT projects that optimize the beneficial reuse of industrial byproducts. An example of a project that has been showcased through the GHP is the Tarrtown Bridge in Pennsylvania, where the Pennsylvania DOT used shredded tires as lightweight embankment fill on two bridge

approaches. The project incorporated approximately 780,000 scrap tires, thereby easing the load on landfills.

In West Virginia, the State DOT is using recycled blast furnace slag as the aggregate of choice in the western part of the State for the majority of the asphalt surface course pavements. The effort results in a safer pavement due to the aggregate's nonpolishing properties (higher friction number). Further, recycling blast furnace slag, when available locally, offers an economic advantage compared with using virgin limestone aggregate.

These are just two examples of the various industrial byproduct materials that FHWA is actively promoting for reuse in highway and bridge construction. As noted above, the Recycled Materials Resource Center mission is to conduct research to insure that the use of recycled materials does not have a negative impact on the environment and to provide technical information to State and local agencies on the proper reuse of the materials.

Conservation and Ecosystem Management (principles and practices). The conservation and ecosystem management team within the GHP focuses on bringing advances in mapping and data management together with various initiatives in conservation and ecosystem management to achieve greener highways. The data and regulatory managers are working to gain agreement on how to develop a set of tailored, core data-sets and maps that can be integrated at both the transportation project and planning levels. The maps will facilitate information sharing at the Federal, State, metropolitan planning organization, and local levels, and will facilitate the integration of conservation and ecosystem management practices into land-use planning. Priority areas for conservation will emerge from the development of a regional ecosystem framework.

The Green Highways Partnership represents the next logical step in the evolution of EPA, FHWA, and Mid-Atlantic State DOT efforts in environmental streamlining and stewardship.

Management of Highway Stormwater Runoff

FHWA has made the issue of managing stormwater runoff a particular focus in its efforts to promote technologies that mitigate damage and impacts to the environment from highway construction and operation.

Highway stormwater runoff, as part of development and urbanization, is a potential source of a wide variety of possible pollutants to surrounding water bodies. Highway surfaces, along with adjoining areas, collect a variety of materials as a result of highway usage, maintenance, natural conditions, and pollution fallout. While highway runoff may be a potential threat to receiving waters, if handled properly the runoff does not have to be a serious problem.

There are a number of highly effective measures available to treat the runoff before it actually reaches any receiving waters. Site-specific practices remain important treatment options, but a changing management style has also embraced the practice of planning at the watershed and sub-basin scales. Best management practices are no longer driven only by water-quality criteria. We are not looking only at “end of the pipe” treatment technologies but, increasingly, are focusing on practices and techniques that

look at ecosystem-level impacts and stressors, such as conserving ecosystems, maintaining natural drainage courses, and minimizing cleared and graded area.

FHWA researches and showcases the various best management practices for managing stormwater runoff from highway projects. These best management practices can generally be categorized as "structural" or "non-structural."

Structural best management practices consist of infiltration technologies, detention, retention, vegetative practices, filtering systems, and porous pavements. Structural best management practices operate by physically trapping runoff until contaminants settle out or are filtered through the underlying soils. They work through gravity settling the constituents, the infiltration of soluble nutrients through the soil or filters, or other biological and chemical processes.

Stormwater management innovations are underway throughout the mid-Atlantic region, where urbanized areas are particularly challenging. In 2004 in Washington, D.C., the District Department of Transportation installed a biocell for stormwater management at Benning Road Bridge. A biocell is composed of natural materials such as mulch, soil mix, and various types of vegetation. Rather than require an engineered structure like a weir or drainage pit, a biocell acts like a filtration trench, where the soil or natural drainage materials filter the water. A biocell can remove up to 90 percent of the suspended solids from stormwater. This project represented the first use of low-impact stormwater management technology by the District government.

The non-structural best management practices deal mainly with source controls such as land use planning, street sweeping, fertilizer application controls, reduced mowing, and litter removal from roads and roadside areas. These methods help reduce the initial concentration and accumulation of contaminants in the stormwater runoff. Non-structural controls can reduce the need for structural controls.

Many States, including Oregon, have implemented a requirement that any engineered stormwater facility, such as detention, treatment, pumping, or infiltration, must be accompanied by a site specific "Operation & Maintenance" manual. This manual is necessary to ensure the agreements and assumptions made during the water resources analysis conducted during the NEPA environmental review process are fulfilled for the life of the facility. The manual is provided to the people responsible for the long-term maintenance of the facility.

FHWA's promotion and technical support for more environmentally sensitive use of de-icing agents and chemicals, as well as abrasion use for winter road maintenance activities, is saving operating budgets and increasing roadway asset service life, with less impact on the roadside environment. We find a similar payoff for improvements in summer work managing the roadsides using improved herbicide and pesticide application and control.

In selecting the most appropriate best management practice, careful consideration must be given to the expected amount of runoff, the type and amount of contaminants, the availability of land, and the physical characteristics of the site. Some best management practices can operate in any weather conditions, while others cannot. Where there is limited space, certain of the structural practices may not be reasonable or feasible, while the non-structural practices can be implemented effectively anywhere.

FHWA encourages all States to study the quality of the highway runoff and its properties before implementing or designing any control treatment strategies for a

specific area. Given that every watershed is different, a one-size fits all approach could result in spending funds for unnecessary or inappropriate treatment. We encourage early study by providing funding for mitigation of impacts associated with Federal-aid highway projects, including stormwater control, technical assistance, training, and research assistance to State and local transportation staff.

See the Attachment to this statement for a status report on research, training, and publications related to stormwater runoff, being carried out, funded, or supported by FHWA.

Obstacles to Implementation of Environmentally-Sensitive Technologies

The permitting program under the Clean Water Act, regulating discharges to waters of the United States, addresses stormwater discharges associated with urban areas and certain industrial activities, and includes transportation facilities. Because of a lack of monitoring information, scientific analysis, and third-party evaluations, it may be difficult for new and innovative technologies to demonstrate significant water quality treatment to satisfy regulatory agencies. For example, the EPA's Environmental Technology Verification Program approves innovative treatment technologies through performance verification and dissemination of information. Some State regulatory agencies have similar programs. While these programs are beginning to test and approve innovative technologies in their region, many technologies are still being tested, thus the level of acceptance by the regulatory agency for meeting permitting requirements may be limited, even if the technology theoretically demonstrates the necessary ability to meet the requirements.

Lack of a sound track record regarding the costs versus the benefits of a particular technology also can be a problem. The business case has to be made for why a new technology is promising for both the environment and transportation. Lifecycle information from existing infrastructure construction will help inform future decisions.

Of course safety and engineering considerations must always be balanced with environmental benefits. However, safety and environmentally sensitive technologies can be compatible. Context Sensitive Solutions that fully integrate safety into the project development process ensure that both the environment and highway safety benefit. For example, properly designed landscaping can ensure adequate sight distances for drivers, avoid deadly fixed object hazards, and maintain the ability of drivers and pedestrians to see each other. Water quality and highway safety can both be improved with gently sloping clear zones that allow errant motorists to regain control of their vehicles and reduce the risk of fixed-object crashes. These clear zones also allow highway runoff to be filtered or absorbed before entering waterways.

Conclusion

When appropriately applied, "green" transportation technologies and practices, such as use of highway infrastructure to mitigate stormwater runoff, beneficial reuse of industrial byproduct materials, and context sensitive solutions, not only yield significant benefits for avoiding or mitigating negative environmental impacts of highway construction, but can produce safety enhancements and economic savings as well. Ongoing research, transfer of technologies and best practices, and new partnerships are providing States and tribal governments more knowledge and tools to address such issues

as stormwater runoff control. A heightened focus on integrated planning should help ensure that potential environmental impacts are identified and addressed early in the project development process.

Mr. Chairman, members, thank you for this opportunity to testify. I will be pleased to answer any questions you may have.