Telling the R&T Story

The Value of Research

Working with its partners in the public and private sectors, academia, industry, and the international community, the Federal Highway Administration (FHWA) plays a vital leadership role in developing and implementing a coordinated highway research and technology (R&T) agenda that addresses national needs, meets future demands, and maximizes the strengths of all research entities.

The technological advances resulting from the FHWA R&T agenda come at a crucial time. While America's highway network is the backbone of the country, this network is aging and many roadways and bridges are now in need of rehabilitation or reconstruction.

Just as technology and innovations built the national highway network, technology is now the key to overcoming today's challenges and sustaining that network. Among the components of FHWA's nationally coordinated highway R&T agenda are:

- ***Highway Research and Development.*** FHWA conducts research in the areas of safety, infrastructure preservation and improvements, planning and environment, operations, policy, and next generation technology.
- ***Technology and Innovation Deployment.*** When new technologies are ready for implementation, FHWA works to accelerate their deployment.
- ***Training and Education.*** FHWA concentrates on training the transportation workforce through such venues as the National Highway Institute and the Local Technical Assistance Program.

THE VALUE OF RESEARCH

From improving the durability of the Nation's highways and bridges to designing and building safer roadways, FHWA's R&T initiatives are meeting today's national needs. Recent R&T accomplishments include advancements in:

Improving Highway Safety

- ***SafetyAnalyst.*** The SafetyAnalyst software provides analytical tools that transportation agencies can use as they make decisions about site-specific highway safety improvements.
- ***Interactive Highway Safety Design Model.*** This suite of software analysis tools can be used to evaluate the safety and operational effects of geometric design decisions on highways.
- ***Crash Modification Factors Clearinghouse.*** The Clearinghouse can help transportation engineers identify the most appropriate countermeasure for their safety needs.
- ***Roundabouts.*** The implementation of one-way, circular intersections known as roundabouts is improving intersection safety across the country.
- ***Ultra-Light Inertial Profiler.*** This instrumented Segway® is being used to assess the condition of sidewalks and curb ramps and determine if they meet the standards of the Americans with Disabilities Act.

Improving Infrastructure Integrity

- ***Hazards Mitigation R&T Program.*** The program's research is helping to reduce hazard risks to highways and bridges.
- ***Long-Term Pavement Performance (LTPP) Program.*** Data collected by the LTPP program have played a critical role in the development and evaluation of every major pavement design methodology developed over the past 20 years, including the Superpave® mix design system and the DARWin-ME™ pavement design software.
- ***COMPASS.*** The COMPASS software allows users to optimize the performance of a concrete mixture in a particular environment, resulting in longer-life pavements.

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- ***CA4PRS.*** This software tool allows agencies to identify highway rehabilitation strategies that balance the construction schedule with inconvenience to drivers and transportation agency costs.
- ***Bridge Inspection Nondestructive Evaluation Showcase.*** The showcase offers training in the latest nondestructive evaluation tools and systems, which can improve the overall reliability of bridge evaluations.
- ***RealCost.*** A tool for performing life cycle cost analysis for pavement selection, the RealCost software provides a cost comparison between two or more competing design alternatives.
- ***Pavement Materials Laboratories.*** The numerous forensic tools developed through FHWA's Materials Laboratories aid in assessing the causes of premature pavement failures.

Strengthening Transportation Planning and Environmental Linkages

- ***Sustainable Highways Self-Evaluation Tool.*** Transportation agencies and Metropolitan Planning Organizations can use the tool to evaluate their projects and practices and rate them for sustainability using a consistent set of evaluation criteria and scores.
- ***Recycling Solutions.*** Best practices for increasing the use of reclaimed asphalt pavement in the United States are detailed in a new FHWA report, *Reclaimed Asphalt Pavement in Asphalt Mixtures: State of the Practice* (Pub. No. FHWA-HRT-11-021).

Reducing Congestion, Improving Highway Operations, and Enhancing Freight Productivity

- ***A Foundation for Future Mobility.*** FHWA's multimodal Transportation Operations Laboratory is exploring how innovative technologies can dramatically improve the performance of the Nation's transportation system.
- ***Targeted Safety Messages Talk to Your Vehicle.*** Research at the laboratory includes testing the Signal Phase and Timing Interface Definition and Prototype, which will define a common two-way interface between vehicle systems, mobile devices, and traffic signal controllers.
- ***Traffic Signal Triggers.*** FHWA researchers are using step-frequency ground-penetrating radar (SF-GPR) to develop a nondestructive method for detecting and assessing inductive loop sensors that are embedded in roadway surfaces.

Assessing Policy and System Financing Alternatives

- ***Passenger Travel Analysis Framework: An Efficient Decisionmaking Tool.*** The framework will provide States with resources for better analyzing and meeting travel need challenges.

EXPLORING NEXT GENERATION SOLUTIONS

FHWA's research is also looking at the infrastructure that will define tomorrow.

- ***Developing the Next Generation of Bridges and Asset Management Tools.*** Data collected by the Long-Term Bridge Performance Program will support a better understanding of how and why bridges deteriorate and how to best prevent or mitigate deterioration.
- ***A New World of Ultra-High Performance Concrete (UHPC).*** Exhibiting superior properties such as exceptional durability, UHPC components can facilitate accelerated bridge construction and allow for the use of longer spans.
- ***Exploratory Advanced Research (EAR).*** The EAR program focuses on long-term, high-risk research with a high payoff potential.

MOVING INNOVATION

New FHWA initiatives are accelerating the deployment of innovation.

- ***Every Day Counts (EDC).*** The EDC initiative is designed to identify proven, ready-to-go innovation aimed at shortening project delivery, enhancing roadway safety, and protecting the environment.
- ***Highways for LIFE (HfL).*** The HfL program aims to raise awareness in the highway community so that new technologies can be moved from the state-of-the-art to the state-of-the-practice much more quickly.
- ***Strategic Highway Research Program (SHRP) 2.*** Managed by the Transportation Research Board, in close cooperation with FHWA and the American Association of State Highway and Transportation Officials, the key focus areas for SHRP 2 are safety, renewal, reliability, and capacity.

More information on FHWA's array of R&T initiatives is featured in *Telling the R&T Story: The Value of Research* (Pub. No. FHWA-HRT-11-053), which is available online at www.fhwa.dot.gov/publications/research/general/11053/index.cfm. For additional details, visit www.fhwa.dot.gov/research.

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