



Telling  
the **R&T** Story

The Value of Research



U.S. Department of Transportation  
Federal Highway Administration

# Introduction: Moving Innovation

## *FHWA's Vital Leadership Role*

The Federal Highway Administration (FHWA) plays a vital leadership role in developing and implementing a coordinated highway research and technology (R&T) agenda that performs the following:

- Addresses national needs.
- Meets future demands.
- Maximizes the strengths of all research entities.





# Technological Advances

## *Overcoming Today's Transportation Challenges*

### R&T Agenda

The key components of FHWA's nationally coordinated highway R&T agenda are as follows:

- **Highway research and development** in the areas of safety, infrastructure, planning and environment, operations, policy, and technology.
- **Technology and innovation deployment**, including accelerating the use of new technologies.
- **Training and education** of the transportation workforce through the National Highway Institute and the Local Technical Assistance Program.



# The Value of Research

## *Recent R&T Accomplishments*

### Five Areas of Advancement

FHWA's R&T initiatives are meeting today's national needs with advancements in the following areas:

- Improving highway safety.
- Improving infrastructure integrity.
- Strengthening transportation planning and environmental linkages.
- Reducing congestion, improving highway operations, and enhancing freight productivity.
- Assessing policy and system financing alternatives.



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## *Improving Highway Safety*

### SafetyAnalyst Software

SafetyAnalyst helps transportation agencies make decisions about site-specific highway improvements. The software's state-of-the-art analytical tools can be used to identify safety problems and potential countermeasures for reducing the frequency and severity of crashes.



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## *Improving Highway Safety*

### Interactive Highway Safety Design Model

This suite of software analysis tools can be used to evaluate the safety and operation effects of geometric design decisions on highways. The software is now being used by transportation agencies to predict crash rates on highway corridors and to identify potential improvements.







# The Value of Research

## *Improving Highway Safety*

### Crash Modification Factors Clearinghouse

The Clearinghouse can help transportation engineers identify the most appropriate countermeasure for their safety needs. The Clearinghouse is available online at <http://www.cmfclearinghouse.org/>.



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## *Improving Highway Safety*

### Roundabouts

The implementation of one-way, circular intersections known as roundabouts is improving intersection safety across the country.





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## *Improving Highway Safety*

### 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 American with Disabilities Act.





# The Value of Research

## *Improving Infrastructure Integrity*

### Hazards Mitigation R&T Program

The program's research is helping to reduce hazard risks to highways and bridges.



# The Value of Research

## *Improving Infrastructure Integrity*

### 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.



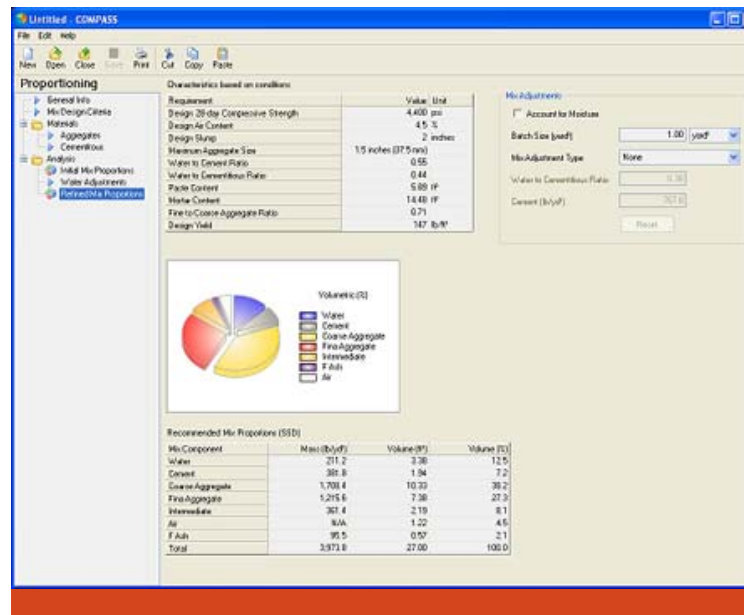


# The Value of Research

## *Improving Infrastructure Integrity*

### COMPASS

The COMPASS software allows users to optimize the performance of a concrete mixture in a particular environment, resulting in longer-life pavements.



# The Value of Research

## *Improving Infrastructure Integrity*

### Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS)

CA4PRS assists transportation agencies in making accelerated construction a reality by identifying highway rehabilitation strategies that balance construction schedules with inconvenience to drivers and costs to the Agency.



# The Value of Research

## *Improving Infrastructure Integrity*

### Bridge Inspection Nondestructive Evaluation Showcase

This showcase offers training in the latest nondestructive evaluation tools and systems, which can improve the overall reliability of bridge evaluations.







# The Value of Research

## *Improving Infrastructure Integrity*

### RealCost

RealCost, a software tool for performing life-cycle cost analysis for pavement selection, provides a cost comparison between two or more competing design alternatives.



# The Value of Research

## *Improving Infrastructure Integrity*

### Pavement Materials Laboratories

The numerous forensic tools developed through FHWA's Materials Laboratories aid in assessing the causes of premature pavement failures.



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## *Strengthening Transportation Planning and Environmental Linkages*

### Sustainable Highways Self-Evaluation Tool

Transportation agencies and metropolitan planning organizations can use this tool to evaluate projects and practices and rate a projects' sustainability using a consistent set of criteria and scores.

The tool addresses the full life cycle of a highway project, from planning through construction to operations and maintenance. It offers users maximum, hands-on flexibility.

The pilot test version is available at <http://www.sustainablehighways.org/>.





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## *Strengthening Transportation Planning and Environmental Linkages*

### Recycling Solutions

Best practices for increasing the use of reclaimed asphalt pavement are detailed in the FHWA report, *Reclaimed Asphalt Pavement in Asphalt Mixtures: State of the Practice* (FHWA-HRT-11-021).



# The Value of Research

*Reducing Congestion, Improving Highway Operations, and Enhancing Freight Productivity*

## A Foundation for Future Mobility

FHWA's Transportation Operations Laboratory is exploring how innovative technologies can improve the performance of the country's transportation system.

The new laboratory contains the following:

- Test beds for developing data resources.
- Transportation concepts and analysis.
- Cooperative vehicle-highway interfaces.



# The Value of Research

*Reducing Congestion, Improving Highway Operations, and Enhancing Freight Productivity*

## Targeted Safety Messages

Research 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.

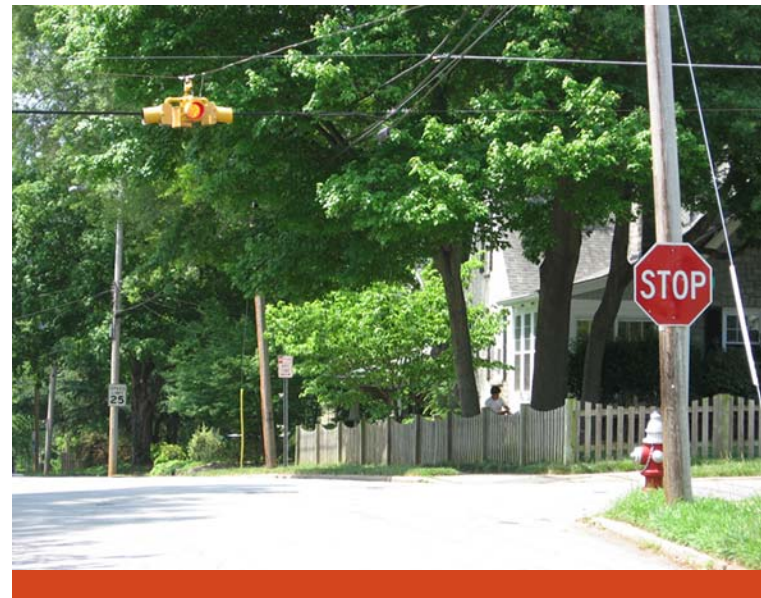


# The Value of Research

*Reducing Congestion, Improving Highway Operations, and Enhancing Freight Productivity*

## Traffic Signal Triggers

FHWA researchers are using step-frequency ground-penetrating radar to develop a nondestructive method for detecting and assessing inductive loop sensors embedded in roadway surfaces.





# The Value of Research

## *Assessing Policy and System Financing Alternatives*

### Passenger Travel Analysis Framework

The framework will provide States with resources for better analyzing and meeting travel need challenges.





# Exploring Next Generation Solutions

## *New Defining Infrastructure*

### Cutting-Edge Tools and Technology

In addition to improving safety today, FHWA researches the infrastructure that will define tomorrow, including the following:

- Data from the **Long-Term Bridge Performance** program will support a better understanding of bridge deterioration.
- **Ultra-high performance concrete** can facilitate accelerated bridge construction and allow for the use of longer spans.
- The **Exploratory Advanced Research** program focuses on long-term, high-risk research with a high payoff potential.



# Moving Innovation

## *New FHWA Initiatives*

### Accelerating Deployment

The following initiatives are putting new tools in the hands of the State and local agencies that need them:

- **Every Day Counts** identifies proven, ready-to-go innovation to shorten project delivery, enhance roadway safety, and protect the environment .
- **Highways for LIFE** aims to raise awareness in the highway community so new technologies can be moved from the state-of-the-art to the state-of-the-practice more quickly.
- **Strategic Highway Research Program 2** (managed by the Transportation Research Board) focuses on safety, renewal, reliability, and capacity.





# For More Information

## *About FHWA's R&T Initiatives*

### Want to Learn More?

More information on FHWA's R&T initiatives is featured in *Telling the R&T Story: The Value of Research* (Report No. FHWA-HRT-11-053) available online at <http://www.fhwa.dot.gov/publications/research/general/11053/index.cfm>.

For additional details, visit <http://www.fhwa.dot.gov/research>.

