

A horizontal banner at the top of the slide features the text "FHWA Research and Technology" in a large, blue, sans-serif font. The background of the banner is a collage of various transportation-related images, including a road winding through a forest, construction workers in orange safety vests, a car on a road, a modern building, a person on a bicycle, and a road with a guardrail.

FHWA Research and Technology

Coordination of Highway Research with University Transportation Centers (UTCs)

Michael F. Trentacoste

Associate Administrator for Research, Development,
and Technology (RD&T)

Federal Highway Administration (FHWA)

Webinar on National Highway Research Priorities

May 10, 2012



A banner for FHWA Research and Technology featuring a collage of images: a road winding through a forest, construction workers in orange vests, a car on a road, a modern building, a person on a bicycle, and a road with a guardrail.

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Webinar Series Topics and Dates

- 1- State of Good Repair, March 28th
- 2- Economic Competitiveness, April 5th
- 3- Safety, May 8th
- 4- Livability and Sustainability, May 9th
- 5- Policy and Innovative Financing, May 10th ←
today



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Invited Participants

- New UTCs
- State Research Managers
- FHWA Division Office Research Coordinators

Host and Presenters

- FHWA Research and Development (R&D) Offices and Program Offices



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Webinar Purpose

- Provide FHWA perspectives on *national challenges and highway research priorities*
- Opportunity for UTCs to consider highway research priorities in their research plans and initiatives
- Inform State research managers on priorities
- Provide FHWA contacts for follow-up communications and coordination



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Thanks for Your Participation

Thanks to Research and Innovative
Technology Administration (RITA) for this
Opportunity to Communicate Priorities to
the UTCs

For more information about UTC
participation, contact:

Debra Elston, 202-493-3181

www.fhwa.dot.gov/research



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The screenshot shows a browser window with the title "Federal Highway Administration Research and Technology". The address bar displays "http://www.fhwa.dot.gov/research/". The page content includes a search bar, a navigation menu on the left with items like "Research Home", "What's New", and "About R&T", and a main content area featuring a featured article titled "Deploying Innovations: Every Day Counts" with a photo of a worker measuring a road. Below this is a "News" section with a link to "Researchers" and a "Find an Expert" section with a "Research Highlights" link and a CD-ROM image. The browser's status bar at the bottom shows "Trusted sites" and "100%".

Visit our Web Site at
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Crosscutting Policy Research

Mary Lynn Tischer, Ph.D., Director
Ross Crichton, Team Leader
Office of Transportation Policy Studies
Federal Highway Administration

Coordination of Highway Research with University Transportation Centers
May 10, 2012



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Topics to be Considered

- The Context: Public Policy
- FHWA Policy Office
- Research Roadmap Areas for Policy
- Condition and Performance Report
- Research Questions
- People to Contact



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The Context: Public Policy Analysis

- **Public policy** is "courses of action, [regulatory](#) measures, [laws](#), and [funding](#) priorities concerning a given topic promulgated by a governmental entity or its representatives."
- Policy Analysis involves identifying a problem that the government needs to solve; designing policy, legislation, regulation to solve the problem; and/or, asks the question: Are the policies doing what they are supposed to do?
- This concept refers not only to the result of policies, but more broadly to the [decisionmaking](#) and [analysis](#) of governmental decisions.



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Associate Administrator for Policy and Governmental Affairs

- Office of Legislative Affairs and Policy Communications
- Office of International Programs
- Office of Highway Policy Information
- Office of Transportation Policy Studies



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Challenges

- Anticipating issues
- Data availability
- Timeliness of the data
- Time provided to perform the analysis (e.g., size and weight)
- Interpreting causality correctly
- Concern with unintended consequences



Roadmap Areas, cont'd

- International Policy, Coordination, and Cooperation—learning from others
 - Coordinate exchanges with China on livability
 - Coordinate with Sweden on livability and sustainability
 - Lead PIARC safety activities; prepare white papers
 - Participate in technical workshop with Korea



Roadmap Areas

- National Transportation Data Collection, Reporting, and Processing
 - Collection Methodology:
 - Office of Transportation Policy Studies (HPTS)
 - National Household Travel Survey (NHTS)
 - Performance measures
 - Traffic Monitoring Guide
 - Technology:
 - License plate capture
 - Weigh in motion (WIM)
 - Unobtrusive measures
 - Interactive Web tools

Roadmap Areas, cont'd

- Comprehensive Utilization of Transportation Data
 - Improve travel estimates; forecast travel
 - Multimodal passenger origin destination model
 - Analysis of HPMS data (e.g., State indebtedness, fuel use, revenues, condition)
 - Safety- analysis of Strategic Highway Research Program 2 (SHRP 2) naturalistic data



Roadmap Areas, cont'd

- Policy Studies, Analysis, and Outreach
 - General policy analysis: cost allocation studies; State expenditures; truck size and weight issues
 - Futures: traveler of the future; uses of the right of way; future of rural America
 - Finances: revenue sources; tolling/pricing; technology issues; interoperability issues



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Roadmap Areas, cont'd

- Performance Management
 - Strategic planning for the agency
 - Framework for the Federal Program
 - Review state of the practice
 - Develop performance measures and national targets
 - Develop tools and build capacity



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Roadmap Areas, cont'd

- Impact of Investment on Transportation Performance and the Economy
 - Analyses of the impact of investment on the economy
 - Biennial Status of the Nation's Highways, Bridges and Transit: (C&P report)
 - Refinements to National Bridge Investment Analysis System (NBIAS) and Highway Economic Requirements System (HERS)



C&P Report Question

- 23 USC 502(h)

“...the Secretary shall submit ...a report that describes --

(A) estimates of the future highway, transit, and bridge needs of the United States; and

(B) the backlog of current highway, transit, and bridge needs ...”



Latest C&P Report Answers

Average Annual Spending (\$B 2008) for 2009 to 2028

Sustain Current Spending Scenario	\$ 91.1
Maintain Conditions and Performance Scenario	\$101.0
Intermediate Improvement Scenario	\$133.5
Improve Conditions and Performance Scenario	\$170.1

Amounts shown represent combined investment by all levels of government not just the Federal portion.



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Arriving at the C&P Answers

- FHWA has been refining its approach since 1968.
- Current generation of tools attempt to apply benefit-cost analysis to the problem.
 - HERS and NBIAS
- Refinements involve many different lines of research.
- **UTCs have a potential role in many of these lines of inquiry !**



Background: HERS

- Utilizes HPMS sample section data (100,000+ samples)
- Identifies deficient sections based on engineering criteria
- Evaluates potential improvements to deficient sections using benefit-cost analysis
- Considers impacts of deployments of operations strategies and intelligent transportation systems (ITS)
- Considers impacts of future changes in user costs of travel on demand (VMT)



Background: Benefits and Costs

- Benefits
 - Reductions in user costs (such as travel time costs, vehicle operating costs, and crash costs)
 - Reductions in agency costs (such as routine maintenance costs)
 - Reductions in societal costs (such as emissions)
- Costs
 - Direct costs of implementing a project



Research Questions: General

- How valid is the overall approach of building up from section level analysis to develop a national estimate?
- How well does the HPMS sample support this type of analysis? Representation of non-State roads?
- What are the differences between current practice and the modeled approach? Are differences due to modeling error, or inefficiencies in typical real world practices?
- What new tools and techniques could be developed to expand the scope of the analysis?



Research Questions: Travel Demand

- What factors (besides price) are likely to influence long-term highway travel demand?
- How is travel behavior affected by changes in user costs (congestion, operating costs, crash risk) or user fees?
- How well do drivers perceive different components of the generalized price of travel?
- How elastic is travel demand relative to price? Do elasticities vary by price component? Do elasticities differ for significant price changes versus smaller ones?



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Research Questions: Capital

- What are the typical costs associated with different types of capital improvements to different types of roads?
- What are tradeoffs among initial cost, expected life, and future maintenance costs for different strategies?
- What are typical practices regarding mitigation of delays, noise, emissions, etc. during construction?
- How are typical costs, strategies, and practices likely to change over the next 20 years?



Research Questions: Travel Time

- How should travel time be valued in general?
- Is it appropriate to recognize heterogeneity among travelers in value of travel time? (Equity concerns?)
- What are the implications of recurring delay vs. nonrecurring (incident) delay?
- What impacts can different types of investments be expected to have on different types of delay?
- What are the impacts of poor infrastructure conditions on vehicle speeds?



Research Questions: Operating Cost

- How are changes in technology and driver behavior affecting typical operating costs associated with driving?
- How are changes in Corporate Average Fuel Economy (CAFE) standards likely to impact vehicle fleet turnover rates?
- What are the impacts of poor infrastructure conditions on vehicle operational costs?
- How accurately do travelers estimate their total operating costs when making travel-related decisions?



Research Questions: Crash Costs

- What statistical values should be placed on fatal and non-fatal crashes?
- What are the typical relationships among system characteristics, system conditions, and crashes for different types of roadways? How are such relationships affected by changes in driver behavior over time?
- How well do drivers generally perceive crash risks when making travel-related decisions?



Research Questions: Agency Costs

- What are the typical routine maintenance costs associated with different types of roadways over time?
- What are the impacts on users and society of different types of maintenance actions?
- What are the implications of deferring maintenance in terms of long term infrastructure performance?
- How can aggressive preventative maintenance actions be expected to impact asset life?
- At what point does it make sense to abandon an asset?



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Research Questions: Societal Costs

- How should one value emissions, greenhouse gases, noise, etc.?
- How are emissions affected by changes in speed cycles under different operating conditions?
- How can other environmental impacts be estimated?
- How can the benefits associated with improved livability or sustainability be quantified most accurately?
- How can system access benefits be quantified? Indirect economic impacts?



Policy Roadmap Contacts

- **Data Collection and Utilization**— *Tianjia Tang 202-366-2236*
- **International Policy** — *Ian Saunders 202-366-0111*
- **Policy Studies** — *Heather Contrino 202-366-5060 or Max Azizi 202-366-9237*
- **Performance Management** — *Rabinder Bains 202-366-2073*
- **Impact of Investment** — *Ross Crichton 202-366-5027*
- **Strategic Management** — *Woody Stanley 202-366-9070*



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Any questions?

For more information, contact:

Mary Lynn Tischer, 202-366-9232

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The screenshot shows a browser window with the address bar displaying <http://www.fhwa.dot.gov/research/>. The page header includes the U.S. Department of Transportation Federal Highway Administration logo and navigation links for "FHWA Home" and "Feedback". A search bar is located at the top right. The main content area features a green banner with the title "Federal Highway Administration Research and Technology" and the subtitle "Coordinating, Developing, and Delivering Highway Transportation Innovations". On the left, a green sidebar lists navigation options: Research Home, What's New, About R&T, FHWA Research, Research Partnership Programs, Turner-Fairbank Highway Research Center, FHWA Research Topics, Research Opportunities, Innovation Delivery, Publications / Downloads, Other Resources, Contact Us, and Site Map. The main content area includes a featured article titled "Deploying Innovations: Every Day Counts" with a photo of a worker measuring a road and a "Read More" link. Below this is a "News" section with a "Researchers" sub-section containing links for "Opportunities to get involved", "Peer Exchange Policy for State Planning and Research", and "State Planning and Research Guide For Peer Exchanges". A "Find an Expert" section with "Research Highlights" and a CD-ROM icon is also visible. The browser's status bar at the bottom shows "Trusted sites" and "100%" zoom.

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Delivering Transportation Services: Innovative Financing, Revenue Generation, and Procurement Strategies

Regina McElroy

Office of Innovative Program Delivery

Federal Highway Administration

Coordination of Highway Research with University Transportation Centers

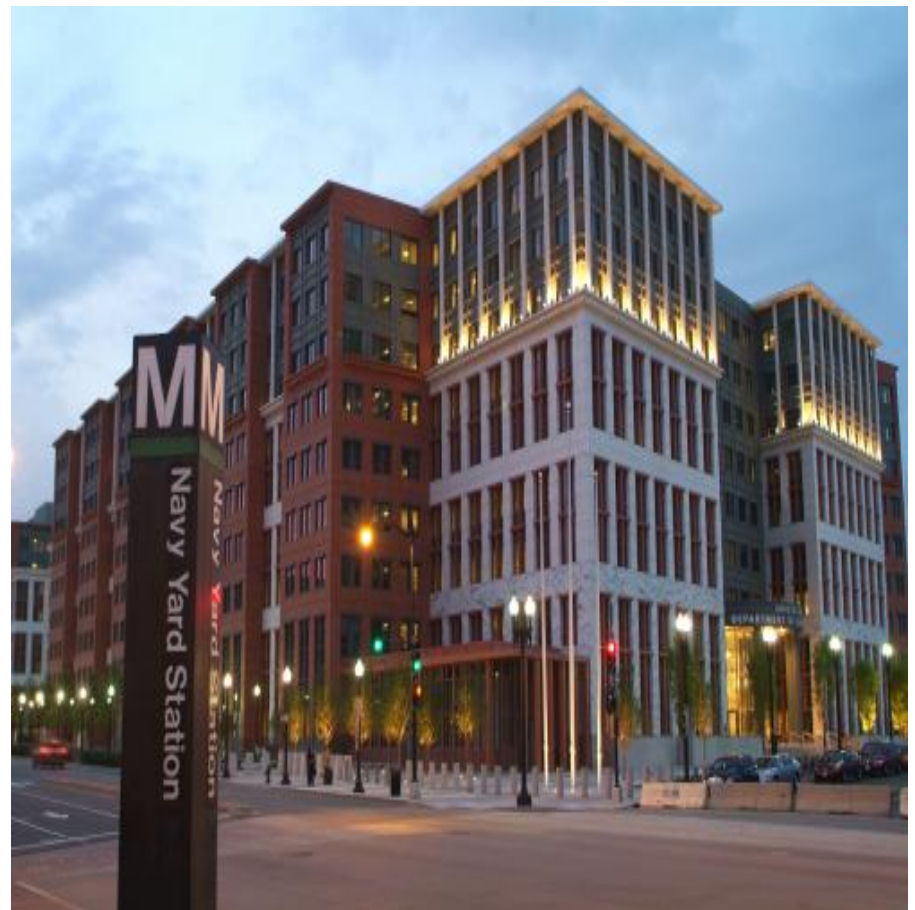
May 10, 2012



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Office of Innovative Program Delivery (OIPD)

- Established October 2008
- Brought together expert staff from across the Agency
 - Resource Center
 - Transportation Infrastructure Finance and Innovation Act (TIFIA)
 - Major Projects
 - Tolling and Pricing



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Why OIPD?

- The challenges facing the transportation industry are enormous – it can not be business as usual
 - Increasing investment requirements
 - Mounting budget pressures
 - Efficient operation of system more important, but difficult to financially sustain
 - Traditional ways of paying for and procuring projects are not fully up to the challenge



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Why Project Finance?

- Brings future revenues into present use and achieves economic, safety, and congestion reduction benefits, NOW, while avoiding potential inflation costs and providing opportunities for economies of scale
- Specifically, refers to assembling the capital to deliver a project and the revenue needed to repay it
- Project finance tools can:
 - Overcome project, market access, and institutional challenges
 - Spread out payment for an asset over the life cycle of the asset (instead of only the first few years)
 - Enable new funding sources
 - Facilitate capital flow to transportation from various classes of investors
 - Provide innovation and asset management benefits



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What is *Innovative Project Finance*?

Well, it is not traditional . . .

1956

1991

1995

1997

2005

2009

TRADITIONAL

- State DOTs only
- Pay-as-you-go; no borrowing; revenue through fuel taxes and general government appropriations
- No outside lending to projects
- Tolling restricted
- Limited private involvement

INNOVATIVE

P3s

GARVEEs

TIFIA

PABs

BABs*

P3s = Public-Private Partnerships

GARVEEs = Grant Anticipation Revenue Vehicles

TIFIA = Transportation Infrastructure Finance and Innovation Act

PABs = Private Activity Bonds

BABs = Build America Bonds

* Now expired.

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Why OIPD?

- What tools (and business practices) are we talking about?
 - **Revenue generation** strategies to include tolling and pricing
 - **Procurement** strategies to include public-private partnerships
 - **Project finance** strategies to include GARVEEs, SIBs (State Infrastructure Banks), Section 129 loans, and TIFIA
- Stewardship is important
 - Major project cost reviews, finance plans, and project management plans
 - Implementation of revenue, procurement, and finance strategies
 - Are the strategies are good value for the public?



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Roadmap Development



- Where are we?
- Where do we want to be?
- How will we get there?



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Where Are We Today?

- Limited experience
- Various State models
- Uncertain public acceptance
- Policy/legislative issues and constraints
- Technical capacity issues
- Lack of performance information
- Etcetera



Port of Miami Tunnel, FL



SH 130, TX

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Where Do We Want to Be?



I-595, FL



Capital Beltway, HOT Lanes, VA

- **It is simple.** We want everyone using (or thinking about using) innovative revenue, procurement, and financing strategies to be smarter. We want to see the efficient and effective use of these strategies in a way that makes sense for the public

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How Do We Get There?

- What topics should we focus on?
- What delivery mechanisms work best?
- What tools should be provide?
- How should we define our target audience(s)?
- How should be allocate our limited resources?



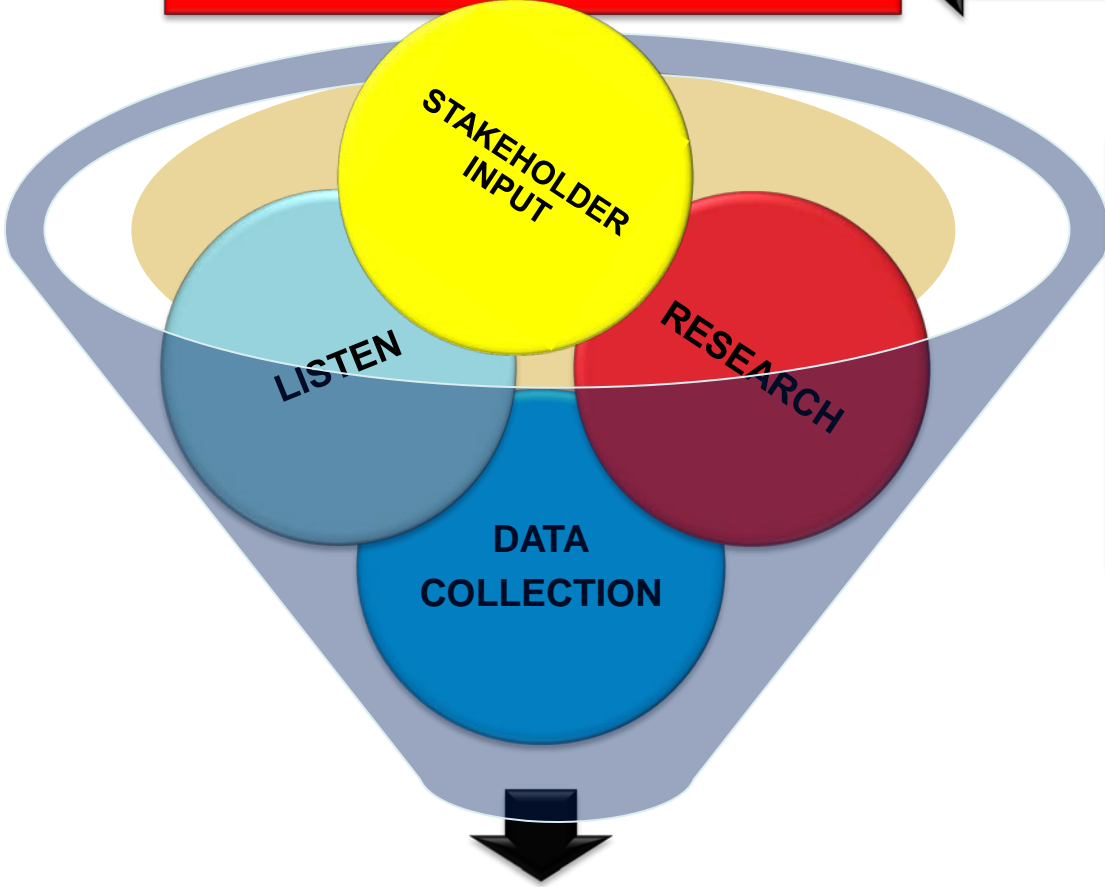
IH 635, TX



North Tarrant, TX

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Stakeholders/Customers



- Products and Services**
- Policy Development
 - Analytical Tools
 - Stewardship
 - Capacity Building/Training/ Outreach/Awareness/ Technical Assistance

Roadmaps

Fiscal resources

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Roadmap Development

- **Topics**
 - P3s, revenue, capacity building
- **How**
 - Small group discussions
 - Diverse participants
 - Feedback page on Web site
- **What**
 - Issue papers identifying research ripe for pursuit
 - FHWA roadmap
 - Related deliverables: E.g., - P3 Leaders Group; P3 Guide for New Practitioners



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2009 > 2010 > 2011 > 2012 > 2013 > 2014 > 2015 > 2016

Research

P3OC

Project Library: Major Project Assessment

International and Domestic Exchanges / Listening Sessions

Policy Development/ Innovations

Special Experimental Program 15

Implementation of Tolling and Pricing Programs

TIFIA Implementation (Federal Credit Support)

Tools

Models

Guides and Toolkit

Stewardship

Major Project Cost Estimate, Finance Plan and Project Management Plan Reviews

TIFIA Oversight and Monitoring

Capacity Building/ Training/Outreach/ Awareness/Technical Assistance

Technical Workshops for Projects and Tools / Peer Exchanges / P3 Leaders Group

Primers and Fact Sheets

IPD Academy (especially Webinars) and Training Web Site

Conference Support

On Demand Technical Assistance (Including Critical Project Review)

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What Are We Looking At Now?

- Statutory Issues
- Financial Market Issues
- Organizational Issues (Including Technical Capacity)
- Decisionmaking Processes
- Revenue Options and Debt Capacity
- Performance Management Issues
- Stewardship Issues



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Getting Involved?

- [OIPD Comment Page](#)
- [Researchers Group](#)
- [Check Out Our Roadmaps](#)
- [Contact Us](#)
- [Your ideas?](#)



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Please visit our Web site for more information on the Office of Innovative Program Delivery and innovative finance tools

www.fhwa.dot.gov/ipd



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Regina.Mcelroy@dot.gov



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