



**Federal Highway Administration (FHWA) Research and Technology Agenda**

**Meeting the Challenge: Policy**

Policy decisions made today will shape the highway transportation system of tomorrow. FHWA evaluates the impacts of a broad range of policy options and analyzes current and emerging issues that will affect the way transportation systems are built, maintained, and used.

Forecasting the effects of proposed legislation and policy decisions requires quality transportation data. FHWA provides guidance and tools that standardize how transportation professionals collect data on highway system characteristics such as road types, funding methods, and travel patterns. Consistent national data provide a snapshot of today's transportation system that is essential for good policy and for projecting future requirements.

By keeping an eye on policy trends, FHWA helps its stakeholders and partners address current transportation challenges and anticipate future needs.

For example, FHWA's policy research initiatives refine current methods and procedures used to analyze the impacts, benefits, and costs of highway infrastructure investments. Through research studies that explore transportation topics pertinent to State, local, and Tribal governments, FHWA helps these entities identify and cooperatively address issues that may have budgetary and legislative implications. FHWA also promotes interagency collaboration and the sharing of program innovations by facilitating information exchanges between the United States, other countries, and international organizations.

**Objective: 1: Evaluate impacts of a broad range of policy options, and analyze current and emerging issues that will affect surface transportation programs.**

**Strategies**

- Research and evaluate policy strategies, alternatives, and outcomes that address current transportation challenges.
- Research emerging transportation policy issues and future challenges.
- Research and analyze transportation finance policy, revenue generation strategies, and technology issues.
- Update transportation models and technical tools used to examine transportation policy issues.
- Develop and deploy tools to assist State and local governments in adopting performance-management principles.
- Develop and refine microeconomic models, tools, and procedures for estimating the benefits and costs of highway and bridge investments and predicting the impact of such investments on future system conditions and operational performance.
- Develop macroeconomic tools and techniques for analyzing the effects of highway infrastructure on the national economy.

**Showcase Activities**

- Studying the Next Generation of Travelers
- Conditions and Performance Report to Congress
- Incorporating Connected/Automated Vehicles in Transportation Planning Processes and Products
- Tools for Estimating Benefit-Cost Analysis and Economic Development Benefits of Connected Vehicle Deployments at Local, Regional, and Statewide

**Studying the Next Generation of Travelers**

The future of personal travel will be influenced by a combination of various events, including: life-cycle changes; demographic and socioeconomic factors; generational social norms; and the adaptation of people to new technologies and travel options. The Transportation Futures team is conducting a formal study to examine the travel behavior of people under the age of 30, which will be used to develop policy recommendations based on improved forecasts of demand, vehicle usage, and the impacts of new transportation technologies on personal travel. The work completed under this project provides both a quantitative and qualitative evaluation of current and emerging travel shifts among different generations. Of particular interest are the impacts

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**Additional Resources**

of new technologies and social trends that may be influencing mode choice, trip making, trip planning, and overall perceptions of vehicle travel among youths in the United States. The combined results of the analyses will be used to develop profiles of the next generation of travelers, and will be considered in the forecasting of future travel trends and travel scenario development. The information presented is ultimately intended to be used as a guide in the development of current and future transportation policies regarding personal travel.

- [FHWA: Office of Transportation Policy Studies - Transportation Futures](#)

### **Conditions and Performance Report to Congress**

The biennial "Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance" Report to Congress provides Congress and other decision makers with an objective appraisal of the physical conditions, operational performances, and financing mechanisms of highways, bridges, and transit systems. Analyses are presented reflecting both the current state of these systems and the projected future state of these systems under a set of alternative future investment scenarios. This report offers a comprehensive, data-driven background to support the development and evaluation of legislative, program, and budget options at all levels of government. It also serves as a primary source of information for national and international news media, transportation associations, and industry.

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### **Incorporating Connected/Automated Vehicles in Transportation Planning Processes and Products**

As connected and automated vehicle (C/AV) technology continues to advance, transportation planners must assess how C/AV technology should be considered across transportation planning processes and products developed by States, metropolitan planning organizations, and local agencies. The objectives of this project are to: identify and analyze how C/AV technology should be considered in transportation planning processes and products under a variety of circumstances; assess the roles and responsibilities of stakeholders; evaluate the needs for new or enhanced tools, techniques, and data to support various C/AV planning activities; and identify workforce skills, expertise, and capabilities needed to carry out C/AV planning. The results of this effort will help transportation planners best utilize the capabilities of C/AV technology.

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### **Additional Resources**

- [FHWA: Policy Analysis and Development Team Web Site](#)
- [Joint Program Office: Connected Vehicle Impacts on Transportation Planning Memo 2](#)
- [Joint Program Office: Connected Vehicle Impacts on Transportation Planning Memo 3](#)

### **Tools for Estimating Benefit-Cost Analysis and Economic Development Benefits of Connected Vehicle Deployments at Local, Regional, and Statewide**

Estimating the costs and benefits of Connected Vehicle deployments can be challenging, so the FHWA embarked on a study to identify new resources that would ultimately yield more accurate estimates. The outcome of the study is a desk reference and a tool for estimating the economic development benefits of Connected Vehicle deployments. These products assist State and local transportation agencies and metropolitan planning organizations to perform economic analyses, including estimated benefits, costs, and potential economic development benefits of connected vehicle-to-infrastructure (V2I) technology and application deployment for their programs, projects, and regions.

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### **Additional Resources**

- [FHWA: Office of Transportation Policy](#)

**Objective: 2: Promote the efficient, systematic, and comprehensive collection and utilization of national transportation data to improve highway management and investment decisions.**

**Strategies**

- Collect, maintain, and disseminate national transportation data to support decisionmakers.
- Develop improved methods, procedures, guidelines, and technical tools for the collection and reporting of transportation data.
- Develop new methods and approaches to present national transportation data, and to transform data into usable information and knowledge.
- Develop and implement tools to link transportation datasets, thereby increasing utilization efficiencies and reducing the potential for data collection duplications.
- Research remedies and preventative measures to eliminate and reduce Federal gas tax evasions in areas of diesel fuel usage.

**Showcase Activities**

- Developing Standards, Procedures, and Methods to Promote Efficient, Systematic, and Comprehensive Transportation Data Collection
- Providing Value-Added Analysis to National Transportation Data
- Establishing Efficient Highway Performance Monitoring System Data System for State Highway Agencies

**Developing Standards, Procedures, and Methods to Promote Efficient, Systematic, and Comprehensive Transportation Data Collection**

Reliable, accurate, and comprehensive travel and transportation data form the foundation of effective transportation decisionmaking. However, collecting travel and transportation data has been a significant challenge because of differences in user needs, data sources, and collection methodologies among States. Changes in technology and data standards can also result in incompatibilities across agencies, further dampening data collection efforts. To address these challenges, FHWA is engaging in research efforts to develop national specifications for multiple transportation datasets, including vehicle classification, roadway functional classification, highway performance and monitoring, traffic monitoring, and household travel surveys. These efforts will increase the effectiveness of agencies' data collection and analysis efficiencies, resulting in more consistent datasets and improved data compatibility among government agencies and the private sector.

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**Additional Resources**

- [FHWA: Office of Highway Policy Information \(OHPI\) Publications and Products](#)

**Providing Value-Added Analysis to National Transportation Data**

National transportation data provide a breadth of information on transportation systems, including temporal, geospatial, behavioral, and socioeconomic aspects. Parameters such as vehicle miles traveled, fuel efficiency, fuel consumption, population, aging, immigration, and greenhouse gas emissions all are interlinked; most transportation data is interrelated. Unfortunately, such critical relationships are often poorly understood. Recent advancements in modeling, statistical analysis, and computing speed have enabled more detailed analysis of the interrelationships among these parameters. FHWA seeks to apply these advancements to national transportation data to help answer questions about the extent of demand for travel and how and why we travel. Greater understanding of these relationships can help the transportation community devise effective strategies, programs, and policies to anticipate and meet the public demand for transportation.

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**Additional Resources**

- [FHWA: Office of Highway Policy Information \(OHPI\) Publications and Products](#)

## Establishing Efficient Highway Performance Monitoring System Data System for State Highway Agencies

Highway Performance Monitoring System (HPMS) data serves as the foundation for virtually everything the FHWA and the transportation community do. From Federal-aid fund apportionment, to condition and performance, to future investment, to freight transportation, HPMS data offers the basis for necessary analysis and modeling. The challenges for this data system concern technology and processes. On the technology front, there are always demands for greater security, data processing capability, and capacity. The challenge of developing processes is that each State has its own unique issues and procedures. The HPMS team strives to both maintain the production function of the HPMS system and make significant improvements to the system.

Several new data quality control protocols were developed and implemented to further automate the process and increase system reliability. Additionally, an effort to explore new cloud preprocessing of State data before official submission is under way.

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### Additional Resources

- [FHWA: Highway Performance Monitoring System \(HPMS\)](#)

## Objective: 3: Research intergovernmental issues between States, cities, and Tribal governments that impact transportation policy decisions, budgetary processes, and legislative recommendations.

### Strategies

- Organize cooperative research studies and work sessions on transportation topics facing Tribal governments.
- Research policy trends in relationships between State, Federal, and Tribal transportation agencies.

### Showcase Activities

- Mission-Critical Legislation and Policy Analysis

## Mission-Critical Legislation and Policy Analysis

Mission-critical legislation and policy analysis support the FHWA, the U.S. Department of Transportation, and the U.S. Congress on legislative and policy development. Policy expertise is used in activities, such as providing technical assistance on surface transportation reauthorization legislation, conducting analyses to support the Federal-aid Highway Program budget, and developing briefings for high-ranking Agency and Department officials. The FHWA Office of Legislative Affairs and Policy Communications also acts as the central point of contact between FHWA and Capitol Hill.

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### Additional Resources

- [FHWA: Office of Legislative Affairs and Policy Communications](#)

## Objective: 4: Promote the exchange of highway technology and program innovations between the United States and foreign countries and organizations.

### Strategies

- Study, observe, and document technologies and practices used in other countries that could significantly improve highway transportation in the United States.
- Organize, facilitate, and participate in information exchanges, meetings, workshops, and conferences between the United States and international and foreign transportation entities.
- Coordinate and facilitate joint research and training activities between the United States and international and foreign transportation entities.

### Showcase Activities

- Exchanging Solutions With Other Countries Through International Partnerships

## **Exchanging Solutions With Other Countries Through International Partnerships**

FHWA's Office of International Programs supports the U.S. Department of Transportation's Strategic Plan through the Global Technology Exchange Program, which focuses on government-to-government relations and activities designed to promote the safe, secure, and efficient movement of people and cargo. The program facilitates technology exchange, information sharing, and partnering relationships between U.S. States and global counterparts in Asia, Europe, the Middle East, and the Western Hemisphere.

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## **Additional Resources**

- [FHWA: Office of International Programs](#)
- [FHWA: Global Technology Exchange Program](#)

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