

# OFFICE OF PLANNING



U.S. Department of Transportation  
Federal Highway Administration

Office of Planning, Environment, and Realty

<https://www.fhwa.dot.gov/planning/>

FHWA's Office of Planning (HEPP) develops and implements programs and activities that advance comprehensive international, interstate, State, metropolitan, rural, tribal, and multimodal planning.

The Federal Highway Administration's (FHWA) Office of Planning, Environment, and Realty offers research opportunities to improve transportation decision-making and promote efficiency while protecting communities and the environment.

- ◆ Informs Decisions
- ◆ Reduces Environmental Impacts
- ◆ Enhances Quality of Life
- ◆ Accelerates Project Delivery
- ◆ Advances Transportation Planning

## Research Focus

The Office's research efforts focus on advancing surface transportation planning with partners and customers by providing a cooperative, performance-driven process by which long and short-range transportation priorities are determined. HEPP's research supports many emphasis areas including census and travel modeling, congestion management, transportation equity, public involvement, rural planning, environmental linkages, freight planning, non-motorized planning, performance management, public involvement, scenario planning, and visualization.

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## FEATURED RESEARCH ACTIVITIES

### Model Long-Range Transportation Plans: A Guide for Performance-Based Planning

In partnership with the Federal Transportation Administration (FTA), FHWA recently published a guide for incorporating performance-based planning into long-range transportation plans (LRTPs). The guide identifies the key components present in a "model" performance-

based LRTP, as well as important process elements for reflecting community priorities and supporting the achievement of desired performance outcomes for the multimodal transportation system. Model LRTPs set the foundation of goals, objectives, performance measures, and targets that support decisions for long-range investments and policies. In addition, model LRTPs also guide shorter-range decisions, such as programming decisions, that support the plan's goals, objectives, and targets. Examples and case studies illustrate the guide's key points. Here is a [link](#) for more information.

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### Virtual Public Involvement (VPI)

This Every Day Counts (EDC) initiative supports agencies' efforts to engage the public more effectively by supplementing face-to-face information sharing and engagement with technology and virtual engagement in the transportation decision-making and project delivery process. In EDC-5, VPI team members focused on introducing eight tools and techniques to advance virtual public involvement efforts with State DOTs. In EDC-6 team members are focusing on Environmental Justice, institutionalizing VPI, in addition to a local approach (outreach includes MPOs, Regional Transportation Planning Organizations (RTPOs), local agencies, and Tribal governments). For more information, please visit the [VPI website](#).

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### Enterprise Data Enhancement for Planning through Geospatial Enabled Linear Referencing (MPO/LRS)

This project is developing guidance by establishing a sound methodological approach to enhance planning technical capabilities with Linear Referencing System (LRS) based geospatial enterprise data. This study will document

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exemplary practices utilized by Metropolitan Planning Organizations (MPOs including Rural Planning Organizations (RPOs), Regional Planning Commissions (RPCs), and Councils of Government (COG), to develop methodologies that will leverage linear referencing as the core enterprise data program consistent with the National FHWA geospatial programs such as the All Roads Network of Linear Referenced Data (ARNOLD). Ultimately the guidance will expand the geospatial data sharing and interoperability between the various transportation planning organizations including MPOs, the State DOTs and FHWA.

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### **VisionEval Strategic Modeling System**

VisionEval is a modeling system to support scenario planning and strategy development. It allows agencies to explore combinations of policies and program elements to explore “what if” questions and develop flexible responses in the face of uncertain future conditions. FHWA is the lead agency for a pooled fund developing and deploying VisionEval. The pooled fund has seven state DOT members, and four MPOs, and it is open to new membership. Members receive technical support for deployment, as well as the opportunity to influence future development of the system. Visit the [VisionEval](#) website for the software and documentation.

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### **Understanding GPS and Mobile Phone Data for Origin-Destination Analysis**

Emerging datasets such as mobile phone and GPS data have now become a promising data source for many transportation planning applications, including origin destination (OD) analysis, which serve as the basis for transportation investment and policy decisions. The aim of this report is not to develop methods for OD analysis but to gain a thorough understanding of such emerging datasets. The study results demonstrate the many different characteristics possessed by the two and their implications for OD analysis are discussed. View the [GPS Mobile Phone Data Origin-Destination Analysis](#) report.

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### **Promises of Data from Emerging Technologies for Transportation Applications: Puget Sound Region Case Study**

With the explosion of the number of studies using big, passively-generated data for transportation analysis, this study focuses on understanding the properties of such data and how these properties affect our ability in deriving trip-related characteristics. View the report [Puget Sound Region Case Study](#).

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### **Quantifying Risk and Uncertainty in Travel Forecasts**

Over the past decades, transportation agencies have used predictive planning with a predetermined plan within a specific timeframe. These predictions rely on models and inputs that carry different types of uncertainties. For current methods, FHWA’s Travel Model Improvement Program (TMIP) looked at risk profiles for models in Chattanooga TN and Toledo OH in the [How-To: Quantify Uncertainty in Travel Forecasts](#) report.

The risks of the predictive planning approach are found in deep uncertainties driven by new technology, climate change, shifts in national and global economies, and pandemics. TMIP partnered with RAND to evaluate forecasting approaches from other disciplines for use by transportation planning agencies. [Transportation Planning for Uncertain Time: A practical guide to decision making under deep uncertainty for MPOs](#) introduces robust decision-making concepts for regional planning applications. Tools for applying these forecasting concepts are developed and demonstrated in [Uncertainty in Travel Forecasting: Exploratory Modeling and Analysis TMIP-EMAT: A Desk Reference](#).

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## National Complete Streets Assessment

In the spring of 2023 FHWA published a summary of the National Complete Streets survey of State DOTs that was completed in 2022. The information collected through this assessment will help FHWA better understand where it can develop additional technical assistance and tools to improve [Complete Streets](#) implementation at the State level.

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## Planning and Environment Linkages

Planning and Environment Linkages (PEL) is a valuable tool for creating efficiencies in the transportation project development process that supports agencies' efforts to accelerate project delivery. PEL represents a collaborative and integrated approach to transportation decision-making that considers benefits and impacts of proposed transportation system improvements to the environment, community, and economy during the transportation planning process to inform the environmental review process.

FHWA has published the new Planning and Environment Linkages (PEL) Handbook and three PEL Flowcharts "Authorities, Purpose and Needs, and Alternatives". The PEL handbook and flowcharts provide practitioners with guidance that support implementing PEL approaches. These resources along with a new Planning and Environment Linkages (PEL) webinar recording is available on the FHWA Environmental Review Toolkit website that offers practitioners with guidance to support implementing PEL approaches.

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## Asset Management

The research will focus on solutions and recommendations for optimized asset management systems towards improving the overall state of good repair for transportation assets across Federal Land Management Agencies (FLMAs). FLMAs are primed to benefit from accelerating the adoption and state of practice of asset management principles to improve the strategic and systematic process of operating and maintaining physical assets. This project is developing resources that are available for asset management practitioners including the [Integration of Asset Management into Planning and Programming](#) report and [Linking Transportation Asset Management, Transportation Performance Management, and Performance-Based Planning and Programming](#) report. Additional case studies and planning and program studies can be found on the [Asset Management Resource](#) page.

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