Office of NATURAL ENVIRONMENT

http://www.fhwa.dot.gov/environment/

U.S. Department of Transportation
Federal Highway Administration
Office of Planning, Environment and Realty

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. The Office supports and conducts research that:

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

The following document highlights specific research activities in the Office of Natural Environment.
For more information, please visit: http://www.fhwa.dot.gov/hep/hep_research/.

OFFICE OF NATURAL ENVIRONMENT

FHWA's Office of Natural Environment (HEPN) develops and implements programs and activities to minimize the adverse impact of transportation on the natural environment.

Research Focus

The Office conducts comprehensive research to support the development and implementation of programs and activities that enhance sustainability, improve resilience, and reduce energy use, air quality impacts, and noise impacts on our highway system. Programs and activities include the Congestion Mitigation and Air Quality Improvement (CMAQ) program, transportation conformity, analysis and assessment of air quality, and highway traffic noise.
Staff Contact: Connie Hill Galloway, 804-775-3378 or connie.hill@dot.gov.

FEATURED RESEARCH ACTIVITIES

CMAQ Program Emission Reductions Calculator

The calculator is a spreadsheet-based tool to assist departments of transportation (DOTs), metropolitan planning organizations (MPOs) and project sponsors to generate emissions benefit information. Released in modules the calculator represents the most common types of projects.
Staff Contact: Mark Glaze, 202 366-4053 or mark.glaze@dot.gov.

Resilience and Durability to Extreme Weather Pilot Program

FHWA is partnering with State DOTs, MPOs, and other agencies in a pilot program to address transportation resilience. The eleven new pilot projects include research related to integrating resilience and durability into agency practices, using available tools and resources to assess the vulnerability and risk of transportation projects or systems, and developing resilience solutions and monitoring performance.
Staff Contact: Mike Culp, 202-366-9229 or Michael.Culp@dot.gov.

Nature-Based Techniques for Coastal Highway Resilience

Green infrastructure such as dunes, wetlands, living shorelines, reefs, and beaches can protect highways from coastal flooding while offering environmental benefits. FHWA sponsored five pilot projects to assess the potential for such techniques to protect specific locations along coastal roads and bridges, held peer exchanges, and developed an implementation guide to assist agencies designing nature-based solutions.
Staff Contact: Tina Hodges, 202-366-4287 or tina.hodges@dot.gov.

Air Quality Modeling Refinements

FHWA is engaged in numerous efforts to support improvements to dispersion modeling techniques through monitor- to-model comparisons, wind tunnel analysis, near road applications, and traffic data collection. Research areas include signalized intersections, traffic emissions beyond the tailpipe, and impacts of vegetative buffers.
Staff Contact: Victoria Martinez, 787-771-2524 or victoria.martinez@dot.gov.

National Traffic Dataset Applications for Air Quality and Noise Analysis

FHWA is developing a combined database of three FHWA datasets (National Performance Management Research Data Set, Highway Performance Monitoring System, and Travel Monitoring Analysis System) for use in vehicle emissions and noise analysis, which utilize EPA's MOVES vehicle emissions model and FHWA's Traffic Noise Model (TNM).
Staff Contact: David Kall, 202-366-6276 or david.kall@dot.gov.

FHWA Traffic Noise Model (TNM) Version 3.0

FHWA updated all related documentation, including frequently asked questions, the Validation Report, and the Technical Manual, to contain information relevant to TNM Version 3.0. TNM now includes an ESRI version and a license-free version. This new version of TNM brings significant changes to the user interface and improvements to the acoustics library. In addition, the FHWA is working to develop and provide training on TNM 3.0.
Staff Contact: Aileen Varela-Margolles, 305-978-7780 or a.varela-margolles@dot.gov.

Alternative Fuels Corridor Program

The FAST Act directed the DOT to designate corridors for electric vehicle charging, hydrogen, propane and natural gas fueling infrastructure at strategic locations along major national highways to improve the mobility of passenger and commercial vehicles that use alternative fuels. To date, FHWA has designated segments of 100 Interstates along with 76 US highways/State roads covering 46 States plus the District of Columbia in its Alternative Fuels Corridor Program.
Staff Contact: Diane Turchetta, 202-493-0158 or diane.turchetta@dot.gov.

Infrastructure Carbon Estimator (ICE) and Highway Energy Assessment Tool (HEAT)

This pooled fund study will update the existing ICE tool adding new research on infrastructure life cycle energy and emissions, and new roadway project types, and improving the model interface. The Minnesota DOT is leading the study. Building on the original ICE tool, FHWA has also developed the new HEAT model, which allows users to estimate energy from vehicles using a proposed facility, as well as energy from the construction and maintenance of infrastructure.
Staff Contact: John Davies, 202-366-6039 or JohnG.Davies@dot.gov.

CMAQ Data Dictionary

FHWA completed research on the data structure and inputs associated with major emissions estimation processes for CMAQ project eligibility categories. CMAQ eligibility determinations as well as annual reporting requirements necessitate the ability to create reliable air quality benefit estimates. The estimated emissions benefits also play a key role in the target setting and reporting requirements associated with the CMAQ Performance Emissions Measure. The CMAQ data dictionary provides background information on approximately 350 data inputs used to calculate emissions estimates associated with CMAQ eligible projects. The results are available via the CMAQ Program website at https://www.fhwa.dot.gov/environment/air_quality/cmaq/
Staff Contact: Karen Perritt, 202-366-9066 or Karen.Perritt@dot.gov.