OFFICE OF
NATURAL ENVIRONMENT

U.S. Department of Transportation
Federal Highway Administration

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

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

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.

FEATURED RESEARCH ACTIVITIES

Synergistic Emissions Benefits for groups of CMAQ Projects

FHWA recently completed research to examine potential synergistic emissions benefits for groups of projects funded by the CMAQ program. The research identified nine groupings of CMAQ projects that may potentially generate more emissions benefits then individual projects.

Staff Contact: Eddie Dancausse, 919-747-7026.

CMAQ Emissions Calculator Toolkit

The CMAQ toolkit contains spreadsheet-based tools to assist State departments of transportation (SDOTs), metropolitan planning organizations (MPOs) and project sponsors to generate emissions benefit information for potential CMAQ projects. A total of 11 modules are now available, representing 24 project types. Each of the Emissions Calculator Tool postings is accompanied by thorough documentation on tool usage and a training webinar recording. Additional tools are being developed to address Vehicle to Infrastructure Technology, Construction Equipment and Port and Intermodal related projects. Synergistic emissions benefits for groupings of CMAQ projects are also being considered.

Staff Contact: Mark Glaze, 202-366-4053.

Resilience and Durability to Extreme Weather Pilot Projects

FHWA is partnering with State DOTs, MPOs, and other agencies in a pilot program to address transportation resilience. The eleven most recent 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.

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 developing nature-based solutions.

Staff Contact: Elizabeth Habic, 202-366-1701.

Air Quality Modeling Refinements

FHWA is engaged in numerous efforts to support improvements to dispersion modeling techniques by evaluating dispersion algorithms, road side barrier algorithms, and vehicle induced turbulence algorithms. Additional research areas include source configuration, urban adjustment factors and traffic emissions beyond the tailpipe.

Staff Contact: Victoria Martinez, 787-771-2524.

Database for Air Quality and Noise Analysis (DANA) Tool

FHWA completed the development of the DANA tool and is currently beta-testing it with several SDOTs and MPOs. The tool combines three FHWA datasets (National Performance Management Research Data Set (NPMRDS), Highway Performance Monitoring System(HPMS), and Travel Monitoring Analysis System (TMAS)) 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.

FHWA Traffic Noise Model (TNM) Version 3.0

TNM 3.0 was released in 2020 with all updated documentation and manuals. FHWA also released a series of deployment materials including TNM instructional videos on FHWA's YouTube channel. A TNM3.0 training course will be available in late 2020. FHWA continues to improve TNM3.0, and a new release is expected in early 2021.

Staff Contact: Aileen Varela-Margolles, 305-978-7780.

Alternative Fuels Corridor Program

The FAST Act directed the U.S. 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 119 Interstates along with 100 US highways/State roads covering 49 States plus the District of Columbia in its Alternative Fuels Corridor Program.

Staff Contact: Diane Turchetta, 202-493-0158.

Infrastructure Carbon Estimator (ICE) v. 2.1

ICE is a pre-engineering tool that estimates the lifecycle energy and emissions from constructing and maintaining transportation facilities. The original ICE tool was updated as part of a pooled fund study led by the Minnesota Department of Transportation (MnDOT), and supported by several other SDOTs and FHWA. The new model (Version 2.1) is posted on MnDOT's website. It incorporates new life cycle research, additional infrastructure elements, and MOVES emissions factors to estimate vehicle operating energy and emissions. Version 2.1 has also been significantly redesigned with an improved user interface.

Staff Contact: John Davies, 202-366-6039.

CMAQ Input 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 and 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 On-Road Mobile Source Emissions Measure. The CMAQ Input Data Dictionary provides background information on approximately 350 data inputs used to calculate emissions estimates associated with CMAQ eligible projects.

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