Highlights from the 2012 FHWA–EPA Northern Transportation and Air Quality Summit

by Kevin Black, Martin Kotsch, Michael Roberts, Greg Becoat, Melanie Zeman, Joseph Rich, Mark Glaze, Paul Heishman, and Mike Claggett

The U.S. Federal Highway Administration (FHWA) partners biennially with the U. S. Environmental Protection Agency (EPA) and local transportation, planning, and environmental agencies to present a meeting to discuss local transportation-related air quality problems and issues for a particular region. This year’s meeting, the Northern Transportation Air Quality Summit (NTAQS 2012), was held in Philadelphia, PA, August 7–8, and featured eight sessions covering 30 topic areas, including legislative actions, National Environmental Policy Act (NEPA) issues, energy policies, climate change, government programs to reduce emissions, and regional analysis of transportation emissions and local highway project impacts. The following is a summary of the findings from each of the eight sessions.
Legislative Updates

Discussions included the reauthorization of the Highway Bill that funds the development and operation of highway infrastructure throughout the United States. The “reauthorization” of the highway program continues the support for highway and highway-related projects and establishes thresholds of federal spending on transportation projects. The new legislation, referred to as Moving Ahead for Progress in the 21st Century or MAP-21, provides funding for projects and programs through September 30, 2014. Ostensibly, MAP-21 reduces the overall number of programs by combining related programs with similar goals and reduces “earmarks” that were a common element in previous reauthorizations. Several programs related to air quality were briefly outlined, including the Congestion Mitigation & Air Quality Improvement Program (CMAQ), transportation planning, accelerating project delivery, accelerating the environmental review process, and freight issues.

Presentations also covered regulations promulgated by EPA, governing both ozone (O₃) and fine particulate matter (PM₂.₅) air quality standards. For O₃, topics included revocation of the 1997 O₃ standard, designating areas for the 2008 O₃ standard, methods for classifying nonattainment areas for the 2008 O₃ standard, and implementing the requirements associated with nonattainment designation. The PM₂.₅ discussions centered on revisions to the PM₂.₅ standard, changes to the conformity rule, and guidance for performing PM hotspot analysis.

NEPA and Planning

Air quality is an issue common to both planning decisions and environmental decisions. This is especially true in areas designated as nonattainment for one or more pollutants. In these areas, transportation plans and programs, as well as individual projects, must demonstrate that they are not going to create a new problem, worsen an existing problem, or delay the attainment of a standard being violated. One issue that has caused concern involves the delay in getting projects completed. To address this concern, an initiative from FHWA known as “Every Day Counts,” which focuses attention on the planning and environmental linkage, allows projects to move more quickly to completion, thus alleviating congestion and reducing air pollution.

Important to the planning process is determining travel demand. This is accomplished through models, which identify accessibility and systems and relate those factors to travel behavior. A system using “tax parcel” data to enhance the information currently used in making decisions on travel behavior was discussed. Related to this travel activity, especially as it relates to air quality, was a discussion of the increase in freight volume carried on U.S. highways. Freight is often carried by diesel vehicles, which generally emit higher emissions of PM and nitrogen oxides (NOₓ) than passenger cars. Strategies to reduce diesel emissions outlined in the FHWA publication, Freight and Air Quality Handbook, were also discussed.

Energy

It was noted that the United States leads the world in the reduction of greenhouse gases (GHGs). However, it was also noted that the current strategy for addressing climate change has not caught on with the U.S. public. Opinion polls have indicated that “climate change” is very low on the public’s list of concerns, whereas the economy and jobs consistently rank at the top of the list. Refocusing attention on the economic benefits of energy strategies would have the dual benefit of gaining the public’s support, while simultaneously supporting the climate change mitigation strategy of reducing GHG emissions.

The need to better understand energy usage in the transportation setting and programs that work were discussed. The perspectives of a major city (New York City) and a major metropolitan planning organization (the Delaware Valley Regional Planning Commission, DVRPC) were given, including their experiences with converting conventionally powered vehicles (both public and
private/locally owned) to alternative fuels. The need for new energy paradigms was also discussed. "Electricity" should be considered as a fuel type, just like coal, as it represents 60% of the country’s energy usage today. The concepts of sustainability, energy versus power, and efficiency also need reevaluation.

Climate Change
Climate change continues to be a topic that occupies the headlines. Several presentations were made on various subtopic issues associated with climate change. The impacts of a changing climate, or at least weather extremes, and the vulnerability of transportation infrastructure were discussed. It was noted that impact assessments needed to be conducted that include “influences,” such as changes in temperature and precipitation, as well as associated phenomena of droughts and other extreme weather problems.

Once potential influence conditions are assessed, “tools” can be used to forecast possible scenarios and the extent of these scenario impacts. Several presentations discussed these tools, including one used for determining the amount of GHGs generated by vehicles: the MOVES model. Guidance on using MOVES for developing GHG inventories was explained. Another tool, the Energy and Emissions Reduction Policy Analysis Tool (EERPAT) developed by FHWA, provides information on conducting policy evaluations for land use, transportation planning, and traffic pricing among other considerations to develop mitigation strategies. EERPAT is designed to work in conjunction with the MOVES model.

Another tool, this one developed by EPA and known as the Travel Efficiency Assessment Method (TEAM), assesses travel efficiency improvements and how they can reduce the emission of GHGs. TEAM, like EERPAT, works in conjunction with MOVES to assess the impacts of reduced vehicle travel. This session also discussed the Infrastructure Voluntary Evaluation Sustainability Tool (INVEST), which is a policy tool using system planning criteria, project development criteria, and operation and maintenance criteria.

Federal, State, and Local Strategies for Reducing Vehicle Emissions
Program and policies have been developed by all layers of government to assist in improving air quality. To provide some insight into some of the various programs available for reducing air pollution, several presentations covered federal, state, and local strategies to improve air quality. Among the programs discussed were the National Clean Diesel Campaign, administered through Diesel Collaboratives (affiliated with regional air quality organizations); and the Congestion Mitigation and Air Quality Improvement Program (CMAQ), administered by FHWA. Both initiatives provide funds for programs (e.g., anti-idling) and products (e.g., diesel retrofitting of diesel particle filters) focused on diesel engines. Through these funding sources, states, for instance, can take credit for making use of these program funds in their state implementation plans (SIPs).

Some discussion highlighted the increasing role of emissions from the transportation of freight by various modes, as shown in Figure 1. One presentation discussed strategies for reducing emissions available to state and local governments, including actions such as placing transportation control measures in their SIPs, which require implementation and transportation emission reduction measures that are enacted on a voluntary, nonbinding basis. Another discussed the different technologies available, such as diesel oxidation catalysts and diesel engines.
particulate filters, and programs such as anti-idling restrictions. An enforcement program implemented in one state, showing how authorities “discovered” improper and illegal methods used by vehicle owners to avoid emission inspection of their vehicle, was also discussed.

**Regional Analysis**

This session discussed the use of MOVES, the required model used for development of SIPs, conformity analysis, and transportation project analysis. MOVES develops emission factors or emission inventories, which state and local planning agencies use to assess the air quality improvements in their region. In this session, EPA provided a status of its plans to update the MOVES model, noting that a new version would be released in 2013.

FHWA and the Volpe Center provided preliminary results of a regional-scale sensitivity analysis conducted on MOVES to determine the parameters having the greatest influence on the models emission rates. Parameters tested included temperature, humidity, ramp fraction, age distribution, analysis year, and average speed distribution. Providing a real-world example of using MOVES and the results generated by some assumptions for these parameters, a metropolitan planning organization noted the impacts that could result from assumed age distributions.

Since vehicle assumptions are critical to assessing the pollution generated by any given fleet, another presentation discussed methods for generating more accurate estimates for planning purposes. This presentation noted that the TRANSIMS model can provide more locally specific vehicle populations important for determining where vehicle “start” and “evaporation” emissions occur—two of the largest contributors to vehicle emissions, as can be seen in Figure 2.

Assessing vehicle locations and trajectories are necessary for accurate emission modeling results. Different types of traffic projection tools, including transportation planning models, traffic simulation models, congestion management, and the federal Highway Performance Monitoring System (HPMS), were discussed, noting the strengths and limitations of these various methods of collecting data and what methods are useful (or required) in certain situations.

**Project Analysis**

Presentations were made on general guidance for these analyses, issues related to developing inputs, and a potential option to evaluate a specific planned project relative to a generalized project. One reviewed EPA guidance for project-level PM analysis. This summary described the individual components, including emission estimates, meteorological data for dispersion modeling, and consideration of background levels and other sources. The end result is a determination of whether a project would exceed the limits set in the National Ambient Air Quality Standards (NAAQS) at any nearby receptor.

Another reviewed the data input requirements to complete the project analysis, with more detail on the definition of “links”. In part, links are set to reflect the roadway geometry, but changes in vehicle activity (e.g., average speed, idling) should also be represented.

A third presentation reviewed a regulatory option known as a “categorical finding,” which allows FHWA to define general categories of projects with assumed operating conditions, to perform analyses for these cases, and to make a determination that these cases meet the hot-spot conformity requirements. Project sponsors can then compare a given project to a similar category in the FHWA finding, and if their project is comparable (or smaller) in

![Figure 2. The relative contributions of different types of emissions: exhaust, start, and evaporative.](image)
The biennial NTAQS meeting continues to provide a forum for discussion of transportation-related air quality issues. The topics summarized above will be considered for the next NTAQS meeting in 2014. For further information on this meeting or to view materials from the 2012 meeting, visit the Web site www.dvrpc.org.

Regional Agencies Forum

The final session of the conference provided an opportunity for state Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) to present the challenges they face in implementing federal programs and requirements, as a part of their planning function.

First from the state perspective, two DOTs noted that multiple conformity “triggers,” which can require DOTs to undertake repeated regional analyses of on-road emissions for actions that the DOTs have no control over (e.g., a revised NAAQS, new emissions model), cause DOTs to have to perform conformity analyses every year rather than the required every four years, costing the state significantly in terms of its resources. In a related issue, DOTs stated that SIPs mobile budgets and conformity analyses can be done using different emissions models (e.g., MOBILE6 and MOVES); however, since conformity must be done using the latest model once grace periods expire, the newer model may project larger emissions to a given area than the emissions budgets developed for the SIP using the older MOBILE model and this could be problematic for the state.

MPOs were next in presenting their concerns and issues. Two MPOs noted that vehicle registration data assumptions have been problematic, since many mobile budget assumptions were based on conditions and changes in vehicle fleets before the most recent economic downturn. Since the economic downturn, vehicle fleet turnover has been slower, resulting in older vehicles remaining on the road longer and thus higher emissions than previously projected. Another issue discussed by the MPO representatives concerned the CMAQ program and how local agencies could get appropriate shares of those funds. State DOTs often distribute these funds as desired, which may not meet the needs of the local agencies.

One overall consensus apparent from all presenters were concerns for new planning/air quality impacts, which may ensue as the result of the new highway reauthorization MAP-21.