

Center for Environmental Excellence by AASHTO

2014 Air Quality Peer Exchange: Summary and Key Takeaways

May 6-7, 2014



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Introduction

The AASHTO Center for Environmental Excellence sponsored an Air Quality Peer Exchange on May 6-7, 2014, in Washington D.C. The event brought together more than 40 air quality practitioners from around the country to exchange ideas, best practices, and lessons learned related to air quality issues facing State Departments of Transportation (State DOTs). In attendance were representatives from about twenty-five State DOTs, three metropolitan planning organizations (MPOs), and FHWA staff.

The peer exchange was an opportunity for participants to share experiences from their air quality work, learn about resources and tools being developed by FHWA and EPA, and engage with one another through presentations and discussions. Throughout the event, participants identified needs for additional technical and program-related resources.

The major findings of the peer exchange are presented in this document, organized by session topics – highlighting good practices, lessons learned, challenges, and technical assistance needs.

Update from AASHTO and Federal Report Out

AASHTO's Air Quality, Energy, and Climate Change subcommittee, a subcommittee of the Standing Committee on the Environment, is actively involved in identifying air quality research needs, providing resources to help State DOTs implement programs that support air quality goals, and helping State DOTs stay informed of air quality developments at the Federal level.

FHWA has been continuing its efforts in MAP-21 implementation. In November 2013, FHWA issued interim CMAQ program guidance, which was posted to its MAP-21 and CMAQ websites. FHWA is currently developing final guidance for the CMAQ program and is conducting research activities to address air quality modeling topics (e.g. MOVES project level sensitivity study, etc.) and to support MAP-21 implementation (e.g., case studies on PM-2.5 reduction projects).

In April 2014, USDOT presented its proposal for the next transportation bill, Generating Renewal, Opportunity, and Work with Accelerated Mobility, Efficiency, and Rebuilding of Infrastructure and Communities throughout America (or GROW AMERICA). The proposal

includes \$302 billion for surface transportation projects over four years. GROW AMERICA calls for a continuation of the CMAQ Program at \$9.6 billion over the four years; with priority consideration for PM 2.5 and a limitation on transfers of CMAQ funds to other programs to 25 percent.

EPA is working on updating the ozone and nitrogen oxides National Ambient Air Quality Standards (NAAQS) and will soon announce new designations for primary annual PM 2.5 attainment and nonattainment areas. EPA is also conducting research related to updating requirements for Near Road Monitoring and is conducting research related to diesel retrofits, travel efficiency strategies, and ports. EPA's new Ports Initiative can be found at:

<http://www.epa.gov/otaq/ports/>.

Air Quality Round Robin: What States Are Working On

15 participants provided brief overviews of air quality work within their agencies, focusing on innovative projects, partnerships or programs, challenges, and technical assistance needs.

Below are several interesting practices featured in these presentations:

- **Public Education and Outreach Programs** — States are encouraging the general public to maintain their vehicles, drive less and adopt other fuel efficient behaviors (e.g., reduce idling, fueling at night, etc.) through public education programs, including Drive Clean Across Texas, Ditch the Keys (Arkansas), and Engines Off Colorado. Missouri DOT is demonstrating the impact of air quality on living systems through an Ozone Garden in St. Louis that is comprised of ozone-sensitive plants.
- **Green Policy Initiatives** — GreenDOT is a policy directive at MassDOT to integrate sustainability into transportation. The program aims to improve air quality and public health by reducing greenhouse gas emissions and tripling the mode share of bicycling, walking, and transit.
- **Fleet Management** — Through its CNG (compressed natural gas) initiative, Oklahoma DOT commits to investing in CNG vehicles, with the goal of having 90% of its light duty fleet (pick-up trucks and cars) as CNG vehicles.

- **Clean Energy Infrastructure** — States are developing infrastructure to support clean energy and reduce fuel consumption. Alaska DOT installed head bolt heater outlets where parked cars can plug in to keep their engines warm (when the temperature is below -20 degrees Fahrenheit) without needing to idle their engines. The California, Oregon, and Washington State DOTs partnered to establish the West Coast Electric Highway to support development of electric vehicle charging stations along Interstate 5.

In addition to the technical needs addressed in subsequent sections, a few common program challenges and needs emerged from the round robin presentations:

- Staff turnover, particularly retirement of long-time air quality specialists, creates a need for more technical training.
- How to prepare for possible nonattainment designation – for states without nonattainment or maintenance areas, there are concerns about the lack of air quality institutional knowledge. Moreover, these states are concerned about a “boy who cried wolf” problem: states want to be prepared, but don’t want to create alarm for something that might not happen.¹
- Coordination among disparate agencies that do not have an understanding of air quality issues, and communicating the value added of air quality analysis.
- The effects of new requirements for near roadway monitoring and placement of monitors.
- Evaluating air quality benefits of bicycle/pedestrian projects.
- Developing MOVES emissions factors and guidance on using MOVES.
- Path forward for project-level analysis, including streamlining for CO hot spot analysis and resources to support project-level analysis for PM.

¹ In particular for areas that may be newly designated nonattainment areas, there is a need for resources that cover topics including: examples of successful organizational structures for administering CMAQ and other air quality programs; contracting for services; the interplay between planning, programming and NEPA; and examples of programs and research from other states.

- Reconciling a disconnect between SIP emissions budgets and current emissions models/planning assumptions used in conformity.

There is also interest in on-going interaction among state air quality practitioners, through mentoring or other types of professional programs.

PM Hot Spot Modeling

Key Messages: PM Hot Spot Modeling

- In general, the most critical input for PM hot-spot analysis can be the background level. Background levels are very difficult to develop for a highway corridor and existing values may not be representative of future values. In some cases, monitors are dispersed (e.g., some states have only one monitor) or are near non-transportation sources and may not represent highway concentrations. Some states have had challenges about where the monitors should be located or whether existing monitors could be used.
- PM-hot spot analysis can require a large number of model runs, both emissions modeling and dispersion modeling. Parallel processing could be conducted in some cases. Data management can be challenging and file management is critical. For example, it is important to be cognizant of file naming, given multiple staff working on different analysis years.
- Transportation modeling is very important, and in some cases, can be the weakest link in the analysis. Regional travel models are not sufficient for project-level vehicle speeds, especially near signalized intersections.
- In western states where fugitive dust makes up the majority of PM-10 emissions, VMT is the primary factor in PM-10 emissions. The results of the fugitive dust calculation can overwhelm the MOVES analysis results, yet the MOVES analysis takes considerably more time and effort.

Project-level PM hot spot analysis is a modeling challenge in many parts of the country. FHWA has developed some representative case studies to examine different highway project configurations and settings using two different emissions models (MOVES2010b and EMFAC2011) and three air dispersion models. Through this work, FHWA developed recommendations for streamlining the analysis process, including:

- Perform processing steps (traffic analysis, emissions analysis, dispersion analysis) in parallel rather than in series.
- Segregate links by defining highway segments with shared characteristics (volume, speeds, truck percentage) that can be analyzed as a group. An issue is that it may be important to segregate vehicle activity during peak traffic periods, and typically one cannot rely on regional travel demand models for project-level vehicle speeds, especially near signalized intersections. For the emissions analysis, speed look-up tables can be prepared, segregated by light-duty and heavy-duty vehicles. For dispersion analysis, links depend on highway width and orientation, in addition to traffic activity parameters. Data from links with shared characteristics can then be merged.

State DOTs expressed interest in future research to develop reference cases for the types of results to be expected in different types of regions for different types of projects. EPA requires use of approved versions of official models; still, these results might be useful for comparison.

Only a handful of State DOTs in attendance at the peer exchange indicated they have run PM hot-spot analysis, but some key issues were identified for potential application in other states.

Notably:

- PM-10 is an important issue in the Southwestern U.S., given significant wind-blown dust. Arizona DOT (ADOT) has conducted PM-10 hot spot modeling for conformity and NEPA; and interagency consultation has focused on model inputs for MOVES and meteorology. ADOT found that background levels are their biggest challenge, given the unique issues around transport in the desert. ADOT uses monitored values and distance weighted averaging, excluding exceptional event days. From these analyses, ADOT found that re-entrained road dust is a much larger issue than the emissions model with MOVES. Most PM-10 is related to vehicle miles traveled (VMT), as vehicles kick up dust from the roadway. Consequently, ADOT hopes to develop categorical findings to reduce the burden of the emissions modeling.

- Maryland State Highway Administration (SHA) has conducted PM-2.5 hot spot analysis in connection with CO hot spot analysis for park-and-ride lots and for a new four-lane roadway. The park-and-ride lot analysis used a sketch planning approach to estimate impacts on vehicle trips, while the roadway project followed procedures in EPA's transportation conformity guidance for quantitative hot-spot analyses using background concentrations from EPA monitoring reports. Using MOVES2010b, SHA found that it is critical to have the MPO's regional conformity analysis database as a default link database. Still, there were a number of data challenges – for instance, not having traffic data to match up with the analysis years. Second, file management was critical, given the extensive amount of input data required and modeling runs required. Finally, although the analysis did not initially include brake and tire wear, SHA found that these factors made a big difference in the results; about a 50 percent increase in resulting PM-2.5. In terms of CAL3QHCR modeling, a key challenge was finding recent meteorological data. It was also important to recognize link type (e.g. at-grade, bridge), and as with the emissions analysis, file naming and management were seen as critical.
- At Colorado DOT, PM hot-spot analysis was conducted for NEPA. Data collection and management were key issues – particularly finding the most current data available, and managing large, complex data sets in the model to achieve consistent results. A challenge also related to the significant amount of work of conducting the PM analysis for all alternatives. Caltrans also has run the analysis for all alternatives, not just the preferred alternative, and found it challenging. They are considering ways to streamline the analysis. Texas DOT has not conducted PM hot spot analysis, since EPA determined that it was not needed for projects where the build and no build scenarios had almost the same VMT in large congested corridors. Texas suggested that other State DOTs work with their EPA Regions in a similar manner.

CMAQ Program Updates and Best Practices

Key Messages: CMAQ Program

- The administration of CMAQ programs varies widely. In some states, the program is administered by the DOT, and in others funds are sub-allocated to MPOs. Regardless of program structure, collaboration between the State DOTs and MPOs is a key to program success.
- Timely project delivery is a common challenge to CMAQ program administration, but states are developing practices to support project sponsors during project implementation.
- Some states have developed standard evaluation processes, tools, or templates for project sponsors to use in calculating emissions, in order to provide more consistency and enable better project comparisons.

Although many of the components of the CMAQ Program remained unchanged (e.g., project eligibility, focus on diesel retrofits), MAP-21 did make some changes. (1) MAP-21 required a certain portion of CMAQ funds to be set aside to fund PM2.5 reduction projects in PM2.5 nonattainment and maintenance areas. To assist State DOTs in tracking spending of the PM2.5 set aside, FHWA created a dedicated FMIS code for the PM2.5 set aside funds. (2) The Federal share of projects costs was reduced to the standard 80 percent (with 20 percent local match) for most project types. Up to 50 percent of CMAQ funds can be transferred to other federal-aid highway programs, with the exception of the PM2.5 set aside. (3) States may obligate funds to projects to establish electric vehicle charging stations or natural gas fueling stations anywhere in the state except in the right-of-way of the Interstate system. (4) MPOs that serve TMAs with a population of 1 million or more that contain nonattainment or maintenance areas will be required to submit a performance plan, updated biennially.

FHWA is working on the final CMAQ guidance. FHWA is also conducting a number of research studies and providing other resources to support the implementation of the CMAQ Program under MAP-21, including: updating the national CMAQ project database, developing cost-effectiveness tables, and conducting an assessment of CMAQ programs.

There is variation among CMAQ program implementation at State DOTs and MPOs, in part, due to the specific pollutants of concern, regional air quality planning priorities, and partnerships, as evidenced by the two program presentations during this session. The Kentucky Transportation Cabinet (KYTC) does not sub-allocate funds, but instead administers the program through its Office of Local Programs in coordination with the Commonwealth's MPOs. In Georgia, CMAQ funds are sub-allocated to MPOs, though the Atlanta Regional Commission (ARC) works closely with Georgia DOT during the entire project selection process. Despite different program structures, KYTC and ARC exhibited that developing thoughtful practices for CMAQ project selection can result in stronger projects and improve project delivery. The approaches used by both agencies are described briefly below:

- *Kentucky Transportation Cabinet:* Due to Kentucky's mostly rural population, demand for CMAQ funds differs from other states – typically applications are generated from just three areas: Louisville, northern Kentucky (part of the Cincinnati, Ohio metropolitan area), and Lexington. In these three areas, there is a high demand for bicycle and pedestrian facilities and ITS projects, and less demand for transit projects than in some other states.

The CMAQ Program – along with a few other federal funding programs (Transportation Alternatives Program, etc.) – is administered by KYTC's Office of Local Programs. The CMAQ project selection process begins when the Office holds a call for projects, when deemed necessary. Applications for projects within an MPO boundary are first reviewed by the MPO, which submits a ranked list of projects to the statewide CMAQ Coordinator. In turn, the Coordinator and a representative in the FHWA Division Office jointly review the projects for eligibility and quality control (check emissions benefit calculations, etc.). The Coordinator then provides the final ranking to the Governor's Office for approval. KYTC's Division of Environmental Analysis conducts NEPA analysis, as needed, for CMAQ and other local public agency projects.

To enhance program efficiency and accountability, the Office of Local Projects provides support to applicants and project sponsors throughout the process, including

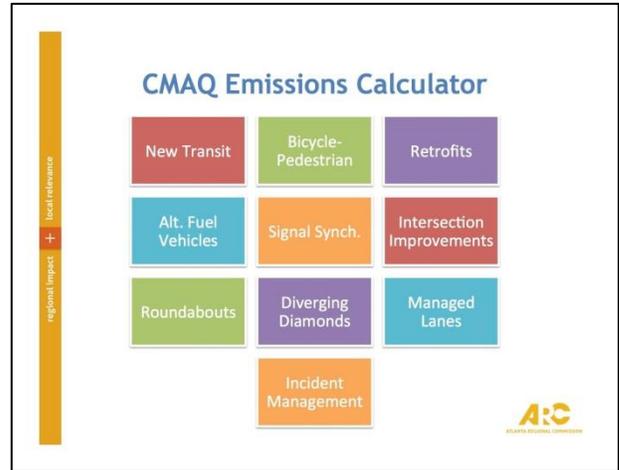
development of a Local Public Agency (LPA) guide, training, and technical assistance on meeting the requirements to apply for and implement federally-funded projects.

CMAQ project completion remains a challenge for Kentucky’s CMAQ program; once funds are awarded, project implementation stalls on some projects. KYTC is working to develop contractual milestones to improve project delivery.

- *Atlanta Regional Commission: ARC* administers the CMAQ program for the Atlanta region. ARC’s CMAQ project selection process is supported by an

innovative CMAQ calculator, which calculates benefits for various types of CMAQ-eligible projects. The tool, which is based in Microsoft Excel, uses a range of data inputs including outputs from ARC’s travel model and MOVES emissions rates, and calculates emission savings and congestion benefits for multiple years. To rank projects, ARC considers the emissions and congestion benefits from the Emissions Calculator, a cost/benefit analysis (amount of emissions benefits per federal dollar spent), and the broader impact to the area within a one-quarter mile buffer of the project location. To the extent possible, ARC also considers an equitable distribution of funds throughout the region.

ARC works closely with Georgia DOT throughout the project selection process – with each party bringing a unique perspective to the partnership. ARC brings a deep understanding of air quality work and Georgia DOT provides institutional knowledge of applicants’ project delivery track records.



ARC’s CMAQ customized Emissions Calculator calculates emissions and congestion benefits for a range of project types shown above.

Air Quality and NEPA Streamlining

State DOTs are interested in expediting project development and delivery, including streamlining the process of conducting air quality analyses within NEPA. Three states – Virginia, Texas, and Oregon – discussed their efforts to streamline and standardize project-level analyses. The states highlighted several examples of effective practices including: NEPA assignment² (addressing all environmental issues), creating standard datasets, NEPA documentation templates, and guidelines for conducting project-level analyses.

Sample Strategies for Streamlining Air Quality Analysis for Conformity and NEPA

- Develop data sets and templates, with input data and sample files, to reduce unnecessary data collection
- Outline standard procedures and programmatic agreements to reduce the need for discussions about individual decisions within interagency consultation
- Take on NEPA assignment (Please note that conformity cannot be delegated to states under current law)

- *Virginia DOT* – VDOT has taken steps to streamline modeling (traffic, emissions, and dispersion) and the interagency consultation process. VDOT also implemented QA/QC procedures to avoid errors. The intent is to reduce project-specific “re-work” (e.g., data collection), manage scopes to limit unnecessary work, and address interagency consultation decisions using an up-front resource document. Specifically, VDOT is developing an online clearinghouse -- a web-based resource document and data warehouse -- that includes a comprehensive set of modeling input data, sample input files, referenced programmatic agreements, and related documents to avoid unnecessary data collection and analysis and facilitate interagency consultation at the project-level. VDOT conducts interagency consultation for conformity (IACC) on the resource document and data warehouse to address policies, procedures, and protocols, and references the IACC on the resource document and in NEPA. VDOT focuses project-

² Please note that conformity cannot be delegated to states under current law.

level IACC on issues that differ substantially from those specified in the resource document.

- *Texas DOT* – MAP-21 allows all states the option of NEPA assignment - the legal assignment of federal NEPA responsibilities to state government. Texas DOT is currently in the process of submitting the application to take on these responsibilities, which it anticipates will streamline project development. Faster project delivery is expected by eliminating review layers. FHWA assignment program audits will be conducted to ensure compliance with all laws. TxDOT is also pursuing a number of additional efforts to streamline the air quality components of project delivery, including updating its Air Quality Handbook for project-level compliance (pending FHWA concurrence), providing project-level templates and pre-analysis coordination, reducing review periods, creating an electronic administrative record, and developing standard emission look-up tables to avoid inconsistencies that may occur when contractors conduct MSAT analysis. TxDOT is also working with FHWA to address cumulative impacts programmatically. Another approach uses document-less categorical exclusions to reduce needless work and errors. Annually, TxDOT processes about 1,100 CEs with 600 of those being document-less and wants to increase that number.
- *Oregon DOT* – ODOT's concerns with project-level MOVES analysis include data collection, consistency with regional modeling, and time and costs required for analysis. In order to streamline the process, ODOT took these concerns to interagency consultation and formed a technical group to share experience with MOVES. As a result, they developed project-level templates and compiled data available from interagency partners (e.g., age distributions, fuel formation/fuel supply, meteorological, and average speeds). ODOT also worked with the Oregon Department of Environmental Quality, Lane Council of Governments, and the Department of Motor Vehicles to create VMT data sets. ODOT also updated statements of work (SOWs) to inform consultants of which templates are available and what they are responsible for creating.

The benefits of streamlining efforts include administrative efficiencies that result in time and cost savings and greater consistency between air quality analyses. Continuing challenges in streamlining efforts identified by the presenting states include:

- Ensuring consistency throughout NEPA – due to changes in project scope.
- Managing expectations from the State Legislature and private investors in public-private-partnership projects, which may differ from NEPA project delivery timelines.
- Addressing staff turnover (e.g., educating new staff on new regulations and tools can be overwhelming).
- Gathering usable data and forecasting future conditions can be difficult. Even with up-front development of templates and datasets, ensuring that templates work with changes in the MOVES model and keeping data current can be challenging.
- Quality assurance/quality control (QA/QC) is an ongoing issue. Smaller margins for PM require an increased focus on QA/QC. New models create increased potential for unrecognized effects, so more thorough QA/QC is needed for consultants' work.

Breakout Discussions

Through group discussions, participants discussed their experiences with modeling and analysis, interagency coordination, and environmental streamlining. The tables below summarize the best practices, challenges, and needs related to two topics: *Modeling and Analysis* and *Interagency Coordination*. [Note: most groups did not have time to address *Environmental Streamlining* in the breakout discussions, and this topic was discussed in a separate session of the peer exchange. Key points are highlighted in the section above on “Air Quality and NEPA Streamlining.”]

Modeling and Analysis

Best Practices

- Use same contractor over time to ensure consistency; develop interagency relationships between DOT and MPOs/state environmental agency to take advantage

of economies of scale

- Document analysis process (data sources, methodology, etc.) to refer back to throughout the modeling process and promote consistency between projects
- Develop Standard Operating Procedure or agreements with Federal agencies on modeling methodology
- Work with state air agency on more frequent SIP updates (example: SIP amendments in North Carolina every 12-18 months)

Challenges

- Collecting input data
- Applying models to meet analysis needs – travel forecasting models designed for regional level analysis do not work well for project level analyses.
- Complexity of running emissions and dispersion models
- Inconsistent results – results vary from model to model and user to user
- Differing travel/fleet assumptions and emissions models used for air quality conformity (latest planning assumptions and emissions models) and State Implementation Plan (SIP)
- Estimating future background levels
- Disconnect between SIP emissions budget and current model/planning assumptions

Technical Assistance Needs

- Training on modeling for users and high-level information about air quality requirements and process for DOT executives
- Documentation of modeling inputs and outputs
- Cumulative assessment of uncertainty for certain models
- Tailored tools to support project-level analysis
- Protocol on how to evaluate MSATs analyses

Interagency Coordination

Best Practices

- Clear documentation of the interagency process

- MOUs that address partners' roles and responsibilities
- Establishing communication protocol that works well for the group (e.g. regular in-person meetings, conference calls, email, etc.)
- Cultivating good working relationships among partner agencies

Challenges

- Balancing differing goals among partner agencies, especially between transportation and environmental agencies
- Reluctance of States to update the SIP to be consistent with the latest models and planning assumptions
- Maintaining effective communication among partner agencies
- Fluctuations in funding that can result in partners leaving the interagency group

Technical Assistance Needs

- Resources on improving coordination between MPOs and State DOT, particularly in light of new performance management requirements

Transportation, Air Quality and Health

Key Messages: Transportation, Air Quality and Health

- Work addressing the intersection of health and transportation varies by state.
- Air quality is a key public health concern and is often a component in efforts to integrate health into transportation planning.
- Educating public health professionals about the transportation planning process will better equip them to play a more meaningful role in discussions about health and transportation.

Interest in the impact of transportation on public health – both the negative impacts (e.g. exposure to air pollution, etc.) and positive impacts (e.g. providing opportunities for physical activity through bicycle/pedestrian facilities) – has increased recently as a result of concerns about the country's obesity epidemic and increasing bicycle/pedestrian movements in

communities around the country. As a result, some states are implementing policies regarding health and transportation.

In Washington State and Massachusetts, new health and transportation initiatives are being integrated at a statewide level. Washington DOT's performance management framework includes a category of goals related to community health and safety. The DOT has partnered with the Washington State Department of Health to promote active transportation, and participated in a Health Impact Assessment (HIA) for a bridge replacement project.

The Secretary of Transportation at MassDOT issued a policy directive that addresses health and transportation. MassDOT's GreenDOT initiative aims to improve air quality and increase the share of biking, walking and transit trips. MassDOT has also participated in an HIA. In addition, it has used infrastructure redevelopment projects to demonstrate how air quality improvements and increasing bicycle/pedestrian access can be compatible with other transportation improvements. One such project was the removal of the dilapidated Casey Overpass. The structure was replaced with an arbor way with sidewalks and bike paths, and new access to rapid transit. The project maintained capacity and did not negatively impact traffic operations, while balancing livability needs. A regional air quality analysis indicated minimal change associated with traffic operations, and multimodal improvements promote mode shifts that reduce emissions (assessed qualitatively).

Air quality will likely continue to be a part of the discussion of public health and transportation. Participants identified the following issues and needs in this area:

- There is a need to better educate public health professionals about the transportation planning process. This will enable them to provide more substantive feedback on improving the health impacts of transportation projects and better inform transportation decision making. Conversely, there is the need to educate transportation planners about assessment methods used by public health professionals (namely HIA and Health Risk Assessments) to more effectively engage public health interests during the planning process.

- Developing methods for quantifying the impact of bicycle/pedestrian access on air quality improvements at the project level, and collecting data on biking and walking to determine mode shift – particularly for calculating emissions benefits for CMAQ projects.
- Clarifying the role of State DOTs in addressing health impacts.

Mobile Source Air Toxics

Mobile source air toxics (MSATs) are compounds emitted from highway vehicles and non-road equipment that are known, or suspected, to cause cancer or other health effects. FHWA updated the MSAT Interim Guidance in 2012 to reflect changes in methodology for conducting emissions analysis using EPA’s MOVES model, as well as updates of research in the MSAT arena. FHWA also developed a quantitative MSAT analysis framework to assist project sponsors in conducting quantitative MSAT analysis. Based on FHWA's analysis using MOVES2010b, diesel particulate matter (diesel PM) has become the dominant MSAT of concern, whereas in the MOBILE model benzene was the predominant air toxic. Projects with higher potential MSAT effects may warrant a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative. A limited number of highway projects are expected to meet a two-prong test for conducting this analysis.

FHWA has provided technical assistance for implementing the Interim Guidance to states and project sponsors, especially for high profile projects where litigation was involved. A key issue in quantitative analysis is defining the affected transportation network and FHWA recommended several possible metrics for defining the affected network. FHWA also provided recommendations for how to run MOVES: conduct seasonal analysis (four times per year), weekdays for average day; select primary exhaust PM10 with all selected fuel/type combinations; and run exhaust and crankcase (no start or evaporative) emissions. A quantitative MSAT analysis using MOVES can generate many files, and it was noted that the administrative record should include (electronically) every file needed to replicate the process.

Florida DOT provided an example of a screening tool that it developed for MSAT analysis. Florida is in attainment for all pollutants, so they have not had to conduct many air quality analyses, except hotspots for CO, for which it uses a screening model. Since Florida DOT already had a screening tool for CO, it decided to create a Florida-specific MSAT screening model. The approach calculated “Maximum Allowable Concentrations” (MACs) to derive threshold concentration values for each MSAT; modified the CAL3QHC model to allow dispersion modeling of MSATs; and modeled MSAT concentrations near several large intersections and freeways. As a result of the analysis, predicted worst-case peak hour max concentrations were multiple orders of magnitude higher than proposed MACs, but concentration beyond 10 feet was below the proposed MACs, leading to a conclusion that there is no evidence of significant health risk to human health in Florida. So far, the model is not in agreement with the FHWA MSAT Guidelines and cannot be used. However, since the results are based on a worst-case scenario, FDOT sees potential for using the model as a screening tool that would prevent the need for project-specific analysis.

State DOTs expressed interest in FHWA posting best practices on MSAT analyses on the FHWA web site or providing examples that could be posted on the AASHTO Center for Environmental Excellence web site.

Greenhouse Gas Emissions Analysis

FHWA provides resources to help State DOTs and MPOs conduct greenhouse gas analyses (GHG), but does not require analysis of GHGs at the planning- or project-level. These publications and tools cater to a range of agency sizes and capabilities, even DOTs and MPOs with very limited experience with emissions analysis.

FHWA has developed two primary handbooks for analysis GHG emissions at the planning-level.

1. The [*Handbook for Estimating Greenhouse Gas Emissions for Integration in the Planning Process*](#) discusses possible approaches, data sources, and step-by-step procedures for analyzing GHG emissions in the planning process.

2. [*A Performance-Based Approach to Addressing Greenhouse Gas Emissions through Transportation Planning*](#) focuses on using GHG performance measures to support transportation decision making.

FHWA also highlighted two sketch tools.

1. The *Construction and Maintenance GHG Calculator* is a simple tool that estimates energy and GHG emissions from transportation infrastructure, construction and maintenance activities. The tool uses inputs available to support consideration of construction and maintenance GHG emissions in long range planning.
2. The [*Energy and Emissions Reduction Policy Analysis Tool \(EERPAT\)*](#) is a sophisticated tool built on interconnected sub-models. EERPAT helps states analyze if/how GHG reduction scenarios and strategies could help them meet state GHG reduction goals and targets.

The Association of Metropolitan Planning Organizations (AMPO) recently surveyed all existing MPOs (N=342) to determine if and how MPOs are addressing climate change. Eighty-three MPOs, representing 35 states, participated in the survey. Thirty-three responded that they do, to some extent, address climate change in the Transportation Improvement Plan (TIP) or Long Range Plan (LRP). The survey findings also suggested that there is a great deal of activity at the MPO level and that some regions are incorporating climate change as a key component of the planning process.

Of those surveyed, 31 MPOs had conducted a greenhouse gas or energy analysis of the transportation sector in their region. The types of analysis methods included emission inventories, GHG scenario evaluations, environmental assessments of the long range plan, and project-level GHG analysis for major projects in the TIP. MPOs are using a range of analytical tools including, MOVES, EMFAC, MOBILE6, REMI land use model, GIS, etc. The survey identified some common challenges for conducting these analyses that included collecting data, scaling data sets to the same geography, and processing the results. Another concern was the difficulty in making assumptions about future technology (vehicles and fuels) and changes in travel behavior.

The survey found that only 13 of MPO respondents include climate change as a factor in project selection when developing the TIP. These MPOs identified varying methods for incorporating climate change in scoring and ranking projects, including considering the change in baseline GHG emissions for each project; using Benefit/Cost ratio to determine the cost of carbon for projects; including climate change in evaluation criteria used by the MPO for prioritizing projects; or creating specific programs to focus on climate change projects. Some of the MPOs did not incorporate climate change into the scoring criteria, but instead considered the impacts subjectively or qualitatively.

The MPOs engaged in climate change work identified a number of technical assistance and resource needs: best practices; case studies; training; GHG analysis methodologies; funding to conduct analysis; information about cost-effectiveness of mitigation strategies; GHG emission factors; and GHG mitigation options.

A range of reasons were given for MPOs that had not prepared a GHG analysis, including: lack of resources or competing priorities, political challenges, analysis not required, lack of technical capacity, a city or state agency is already performing analysis, and/or a focus on climate adaptation. Some MPOs indirectly address climate change through strategies such as complete streets, non-motorized modes and transit-oriented development.

Emissions Reduction Strategies

Tennessee and Georgia DOTs shared examples of current emission reduction strategies used in their states, including the example strategies below:

- **Highway Emergency Response Operations (H.E.R.O.)** — Incident management program that provides first response to highway emergencies. Crews remove vehicles from travel lanes, when possible.

Best Practices

Implement a suite of strategies to achieve synergistic benefits. Combine short-term strategies with immediate impacts (e.g. engine retrofits) with longer-term improvements (e.g. signal timing synchronization) and strategies that influence travel behavior changes (e.g. TDM).

- **Clean transportation projects** – State DOT protocols that reduce air quality impacts, including lower speeds for heavy-duty trucks, prohibiting mowing on air quality action days, planting lower-maintenance grasses along interstate rights-of-way, and using clean fuels.
- **Regional traffic operations** – A corridor-wide signal timing program that actively manages traffic flow on mainline routes and coordinates across jurisdictions.
- **Retrofits** – Partial and full replacement, repowering or rebuilding of school bus and freight locomotives.
- **Transportation demand management** – TDM programs provide services and incentives to commuters to utilize carpool, vanpool, transit or telework options.
- **Flashing yellow arrow** – Reduces vehicle idling and left turn crashes.

Wrap Up

The participants expressed that the Air Quality Peer Exchange was a valuable opportunity to share information and connect with air quality practitioner from other states. The presentations and group discussions revealed some widely-used approaches and best practices, along with common challenges and needs among State DOTs and MPOs.

The peer exchange highlighted the need for information and guidance on a range of air quality topics to help air quality practitioners do their jobs more effectively. Specifically, participants expressed interest in the following:

Research & Technical Resources

- Resources and tools for analyzing bicycle/pedestrian projects.
- Examples of greenhouse gas analyses using EERPAT and other models.
- Case studies and research on post-implementation analysis to evaluate the real impact of air quality initiatives.
- National dialogue about “road diet” projects and methods to address congestion issues related to removing capacity.
- Tools for quantifying PM hot spot mitigation measures (sound walls, etc.).

- Resources on data collection methods (e.g. measuring out-of-state traffic, etc.)
- Resources to enhance project-level analysis, including model evaluation and improvement.

Program Management

- Best practices to address construction air quality issues, particularly on developing bids and working with contractors.
- Examples of how states are spending CMAQ funds, including success stories and best practices.
- A guidebook for newly-designated nonattainment areas.
- Resources on how to manage consultants (reviewing work, template scopes of work, etc.).
- Training resources, particularly for new staff, on the technical side of air quality work.
- Templates for producing administrative records to document running MOVES, AERMOD, and other modeling analyses.

Outreach & Partnerships

- Examples of public-private partnerships used for emission reduction projects and information on cost-sharing and financing.
- Air quality educational materials for outreach to high level decision makers, politicians, and the business community, and guidance on effectively communicating with these audiences.
- Resources on effective ways to raise awareness of air quality issues and the implications of reaching nonattainment status.

Appendix A: Unconference Session Questions

On day two of the Air Quality Peer Exchange there was a one-hour “Unconference Session” to address topics that were not covered during the sessions or to revisit topics of particular interest. Throughout the event, participants were encouraged to write questions or discussion ideas on Post-It notes for this session.

Below is the list of questions generated by meeting participants, many of which were discussed during the Unconference Session. These questions will be further explored and considered by FHWA, AASHTO, and the Center for Environmental Excellence as needs and technical assistance opportunities are identified and addressed.

- For a state with little to no experience with transportation conformity, what training is recommended as a good starting point for learning about conformity analysis and other related subjects? Is training on modeling software valuable if using consultants to conduct air quality analysis?
- How are States/MPOs tracking projects using the PM 2.5 set-aside?
- Are there any suggestions for projects/initiatives that FHWA and AASHTO (especially the Air Quality, Climate Change and Energy Subcommittee) can collaborate on?
- Which methods/processes are states using to determine projects of air quality concern? What is considered regionally significant?
- How are states/MPOs evaluating air quality benefits of bicycle and pedestrian projects?
- Have any DOTs had EPA comments on port or port related projects?
- In regards to MOVES, is project-level sensitivity analysis addressing modeled projections vs. monitored projections?
- How do different states split up regional conformity vs. project-level conformity between DOTs and MPOs?
- Are State DOTs using their own state fleet mix or national default values? Has anyone had trouble getting the fleet mix data?
- I don't understand how identifying localized (project-specific) impacts of pollutants provides any context for how these pollutants are managed regionally under the CAA?
- Does anyone perform construction emission analysis for construction projects lasting less than 5 years?
- Coordination among disparate agencies?
- Is there a need for a more standardized methodology to calculate emissions reductions for CMAQ projects? What states have standardized methods? How were they developed?

- Has any state identified a threshold for what constitutes a “project of air quality concern” for CO or PM hot spot determinations by the consultation partners?
- Is any DOT seeing increased EPA comments on their projects – from Air Quality or Environmental Justice?
- Is project level PM_{2.5} analysis required for state-funded regionally significant projects with no Federal involvement?
- Performance plans: What should be the State DOT’s involvement? They are required for MPOs in TMAs with population over 1 million. Should these be submitted as part of the annual CMAQ report or other reporting?
- More information on the research being conducted on health and transportation, and the implications for DOTs.
- What is the extent of a Health Impact Assessment? Does it involve exposure modeling or is that part of a Health Risk Assessment?
- Should AASHTO also track greenhouse gas guidance from the Council on Environmental Quality?
- Has anyone had to do general conformity for an electric rail project?
- What type of tools would be useful for assistance in calculating CMAQ emissions? Guidance on using MOVES emission rate look-up tables? Calculators? Others?
- CO analyses under NEPA:
 - Who is doing them?
 - Who has screening protocols? (Based on MOBILE or MOVES?)