

INTEGRATING AIR QUALITY AND TRANSPORTATION PLANNING: A RESOURCE COMPENDIUM



U.S. Department of Transportation
Federal Highway Administration



NARC

Building Regional Communities

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Foreword

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In 2001, the National Association of Regional Councils (NARC) entered into a partnership with the U.S. Department of Transportation Federal Highway Administration (FHWA) and with support from the U.S. Environmental Protection Agency (EPA) to examine the changing dynamics within the transportation planning community, as it pertains to creating healthier, cleaner air within the communities in which they function.

Through the partnership of both FHWA and EPA, NARC was able to identify forthcoming concerns and opportunities in the transportation and air quality planning field, and developed resources and information to improve the state of practice. The organization leveraged its network of local elected officials, practitioners and stakeholders to conduct peer-to-peer trainings, provide information on newer technologies employed by the private-sector industry, as well as regular updates on developments within the federal government relating to air quality conformity rules, changing CAFÉ standards and innovations intended to curb greenhouse gas emissions.

This Compendium is intended to provide examples on a variety of areas of interest to the transportation and air quality planning community and provide them with the knowledge and expertise with which they may further the state of practice within their own communities. This publication marks the second iteration of the Compendium, adding summaries of four additional workshops, compiling and condensing previous workshop summaries, and presenting the information in a cleaner, modern format.

This project's success, in large part, has been due to the ability of the participants to engage with one another in person and develop a network of trusted experts from whom they may solicit additional information as federal rules, regulations and legislation changes the nature of their work. With this Compendium, NARC seeks to capture the debate and concerns at the time planners are engaged in new activities, and track changes within the planning community on which NARC, FHWA and EPA may track progression in the application of new standards and technologies. The project employed an unusual style made possible through a multi-year partnership between the EPA, FHWA and NARC. NARC looks forward to developing new partnerships that will continue to inform the state of practice within this increasingly important community.

About NARC

The **National Association of Regional Councils** (NARC) is a 501(c)(3) nonprofit membership organization and public interest group, which advocates for building regional communities through the representation of multi-purpose, multi-jurisdictional Regional Councils (RCs) and Metropolitan Planning Organizations (MPOs). These organizations serve local elected officials and community leaders in developing common strategies for addressing complex issues, in the areas of transportation, economic development, homeland security and environmental challenges.

A recognized authority and leading advocate for regional organizations and regional solutions, NARC is a unique alliance with representation from local elected officials, RCs and MPOs nationwide. NARC has an active membership, representing over half of the national network of RCs. Of the 39,000 local governments in the U.S. (counties, cities, townships, etc), 35,276 are served by RCs.

About the Compendium

This Compendium was written to serve as a resource for local elected officials and air quality and transportation planners to learn how the community of practice is addressing challenging technical, policy and institutional transportation and air quality planning situations writ large. These in-person discussions and interactions are especially critical to regional councils or metropolitan planning organizations in their efforts to address transportation conformity and communicate their actions with the communities in which they function.

Acknowledgments

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Introduction

Since 2001, the **National Association of Regional Councils** (NARC) has produced a body of work on integrating air quality and transportation planning in partnership with the U.S. Department of Transportation Federal Highway Administration and with support from the U.S. Environmental Protection Agency. This publication marks the second iteration of the Compendium, adding summaries from four additional workshops, compiling and condensing previous workshop summaries, and presenting the information in a cleaner, modern format. This updated document is intended to provide essential information, innovative ideas and inspiration for transportation and air quality planners who continue to work to integrate these two fields. As the information presented in this Compendium reflect the timing of each workshop and are intended to provide a snapshot of current science, technology, policy and regulatory information, any changes either in staff and organizational structure that may have occurred since the date the workshop was conducted has not been updated in this document.

This Compendium includes information from the 14 workshops conducted at NARC sponsored events between 2001 and 2009. All workshops focused on current technical or policy issues essential to integrating regional air quality and transportation planning. These workshops sought to provide breadth and depth of understanding by featuring a variety of experts, spanning the range of government, academic, practitioner and industry representatives. Regional transportation and air quality planners, local elected officials and other stakeholders comprised these workshops targeted audiences. Together these workshops illustrate the importance of educating planners and local elected officials on the history, current requirements and potential next steps in transportation and air quality planning, particularly at the regional level.

Through the utilization of this Compendium, NARC seeks to further the practice and looks forward to developing new workshops that continue to inform planners of advances in technology and policy. Select presentations and workshop materials are available under the workshops section of NARC's website at www.narc.org.

As a result of the trainings and information obtained throughout the project, it is apparent that many planners and local elected officials served by this series of workshops depend on their peer community to provide information on innovations and advancements in their region to develop applicable solutions in their own communities. As the state of practice will continue to change and evolve with the implementation of new regulation and legislation, it is important that additional training be provided to allow regional planners and the communities they serve to better prepare and react to future changes.

Workshop One, June 2, 2001: Integrating Air Quality and Transportation Planning

The National Association of Regional Councils (NARC) held the first of a series of workshops on integrating air quality and transportation planning in Omaha, Nebraska, on June 2, 2001. This workshop examined the concept of “conformity” and the federal, state and local role in achieving conformity.

The goal of the workshop was to provide, from the perspectives of both air quality and transportation planning, state and local agencies basic information, best practices, and other resources necessary to understand and achieve conformity. In addition, with the growing number of lawsuits surrounding conformity issues and an anticipated Supreme Court ruling on the issue of conformity at the time of this workshop, several presenters discussed the regional mobility ramifications of these legal rulings.

The questions addressed include:

- What is conformity?
- How does the federal government review conformity?
- What is required of Metropolitan Planning Organizations (MPOs) and Councils of Governments (COGs) in achieving conformity?
- What are the State Departments of Transportation’s (DOTs) roles in conformity?
- How can MPOs and COGs handle the threat of conformity litigation?

Workshop one focused on providing state and local agencies with the resources and information to achieve air quality conformity standards within their regions. It emphasized different approaches that MPOs and COGs have taken to achieve conformity, and the role that state DOTs have in this process. It also illustrated the various challenges in integrating air quality and transportation planning, and the effects of conformity litigation on regional mobility.

Workshop Topics and Presenters

- 1.1 Ozone Air Quality Standards: A Federal Update on Attainment and Nonattainment
Tom Helms, U.S. Environmental Protection Agency (EPA), focused on the health effects of ozone, the history and process for setting EPA’s National Ambient Air Quality Standards (NAAQS), and current information on the status of nonattainment and attainment of the NAAQS.
- 1.2 *Smart Growth and Innovative SIP: Opportunities and Challenges of a New Strategy*
Diane Franks, Maryland Department of Environmental Quality (DEQ), focused on the innovative land use and transportation programs that are integrated into Maryland’s proposed state implementation plan (SIP) and described the challenges faced by state and local agencies in creating Maryland’s proposed *Smart Growth and Innovative SIP*.
- 1.3 Local Air Quality Planning Challenges: A Regional Planning Agency/Metropolitan Planning Organization Perspective
Lindy Bauer, Maricopa Association of Governments (MAG), illustrated the air quality issues challenging MAG. She detailed both the plan to reach attainment and the risks associated with nonconformity. She also described the importance of performing conformity tests and air quality models.

- 1.4 A Look at Transportation Conformity From a Federal Perspective
Daniel Wheeler, U.S. Department of Transportation Federal Highway Administration (FHWA), focused on transportation conformity issues from the federal perspective, as well as the resources available to MPOs in dealing with conformity requirements.
- 1.5 Transportation Conformity: A State DOT Perspective
Paul Silva, Rhode Island DOT, discussed transportation conformity from a state DOT perspective, providing an overview of the Rhode Island DOT methods for demonstrating and achieving conformity.
- 1.6 Examining Potential Effects of Transportation Conformity Litigation on Regional Mobility
Lilly Wells, Houston-Galveston Area Council (HGAC), addressed transportation conformity issues from a regional perspective, with a focus on the potential consequences of litigation on regional mobility.
- 1.7 The Legal Ramifications of Litigation: An MPO Perspective
Chick Krautler, Atlanta Regional Commission (ARC), discussed the implications in dealing with a series of legal actions resulting from nonattainment status.
- 1.8 Gaps Between Air Quality and Transportation Planning: A COG Perspective
Michael Morris, North Central Texas Council of Government (NCTCOG), outlined NCTCOG's insights and experiences using MOBILE6, an updated version of the software program used for mobile emissions factor models, and also detailed several current gaps in integrating air quality and transportation planning.

1.1 Ozone Air Quality Standards: A Federal Update on Attainment and Nonattainment



Tom Helms
U.S. EPA

www.epa.gov

Background

Ozone related health effects are of significant concern. Ozone is created when volatile organic compounds (VOC) and nitrogen oxides (NOx) are mixed in the atmosphere. Bad ozone causes or aggravates a series of health related concerns, including respiratory difficulties; growing evidence also suggests associations with premature death. To address the issue of ozone, EPA has promulgated and enforced strict 1-hour and 8-hour NAAQS to protect human health.

EPA revised ozone NAAQS in July 1997, setting the primary standard at 0.08 parts per million (ppm) over an eight hour period. Area designations for the 1997 ground-level ozone standards became effective in 2004. The Agency expects the area designations for the 2008 standards to take effect in 2010.

Overview

EPA's process for setting NAAQS includes a three layer review with nine steps. The process to reset standards can be overturned at any point during the nine step process. An analysis of the scientific studies on the health and environmental effects of ozone start the review followed by a scientific peer review of published studies. From this, EPA develops a criteria document, an extensive assessment of the scientific studies. Throughout the entire effort, EPA and the public perform ongoing reviews of the data. Federal rulemaking to promulgate the NAAQS is completed after the proposed new standards are discussed at a public hearing and time is allowed for public comment.

After years of challenges and court hearings on NAAQS, on February 27, 2001, the Supreme Court upheld the constitutionality of the Clean Air Act (CAA), affirming EPA's authority to set revised ozone

standards. The Court also reaffirmed EPA's position that the CAA requires EPA to set NAAQS at levels necessary to protect public health and welfare without taking into consideration the economic costs associated with implementing the standards. The Court also requested that EPA reconsider its approach for transitioning to the new 8-hour standard.

The CAA requires EPA to designate an area as nonattainment if it does not meet or contribute to improved ambient air quality for ozone. The EPA previously designated 1-hour nonattainment areas in November 1991 and 8-hour nonattainment areas in April 2004. A nonattainment designation informs the public of ozone-related health problems. It also initiates an air quality planning process for the area, which results in the preparation of a SIP. The SIP is built on an emissions inventory and control strategy, providing an emissions budget and allocating emissions reductions among sectors such as highway and non-highway sources and controlling measures for VOCs and NOx. Other programs required in SIPs, include transportation conformity and the pre-construction review of new or modified stationary sources.

The CAA requires that federally supported activities "conform" to the requirements of the SIP. Conformity indicates no new violations, no degradation of existing violations and no delay in the timely attainment of NAAQS. A control agency can conform to the specifics of the SIP in numerous ways; for example, by funding transportation control measures (TCM) and adopting additional measures to meet the emissions reductions required in the plan. In most cases, the conformity requirement enforces the SIP budget as an emissions ceiling. The SIP process is mandated under Title I of the CAA. A state can also decide to revise its own SIP at any time, although it must go through both a public comment process and EPA review.

Outcomes

As of this 2001 presentation, EPA continues to work toward the resolution of a comprehensive guideline for the implementation of the 8-hour standard, including:

- reconciling CAA subparts I and II;
- establishing geographic coverage (i.e., existing 1-hour nonattainment areas versus the larger 8-hour nonattainment areas);
- deciding on classifications (i.e., whether or how to classify; role of mandatory measures under the CAA, subpart II);
- reviewing the timing of the designations, attainment dates, SIP submissions and attainment demonstrations and their relation to transport; and,
- examining conformity requirements, new source review requirements in transport cases, early reductions, and particulate matter-2.5 (PM2.5) and regional haze (RH) activity.

1.2 Smart Growth and Innovation SIP: Opportunities and Challenges of a New Strategy

Diane Franks
Maryland DEQ
www.mde.state.md.us



Background

In 1997, the Maryland legislature passed the land use initiative Smart Growth and Neighborhood Conservation Act and in 1999/2000, it enacted the Commuter Benefits Act, a transportation initiative. Other innovative programs established by the state to ease ozone concerns have included the Commute Smart Program (1999) and the Ozone Forecasting and Voluntary Action program (1996). All of these efforts were intended to positively impact land use and air quality issues within the state.

Overview

When the City of Baltimore was designated a severe ozone nonattainment area, state and local agencies involved with developing the SIP made use of the initiatives and programs described above. Executing smart growth projects and applying TCM assisted these agencies in addressing some very challenging and difficult conformity issues, which were emerging from the approval of the SIP in 1999. Maryland's focus on land use and transportation was made possible by EPA guidance, helping pave the way for the state to gain credit for innovative emission reduction programs, ultimately creating Maryland's Smart Growth and Innovations SIP. As a result, the SIP bundles smart growth projects with a variety of TCMs in order to generate air quality benefits in the Baltimore area.

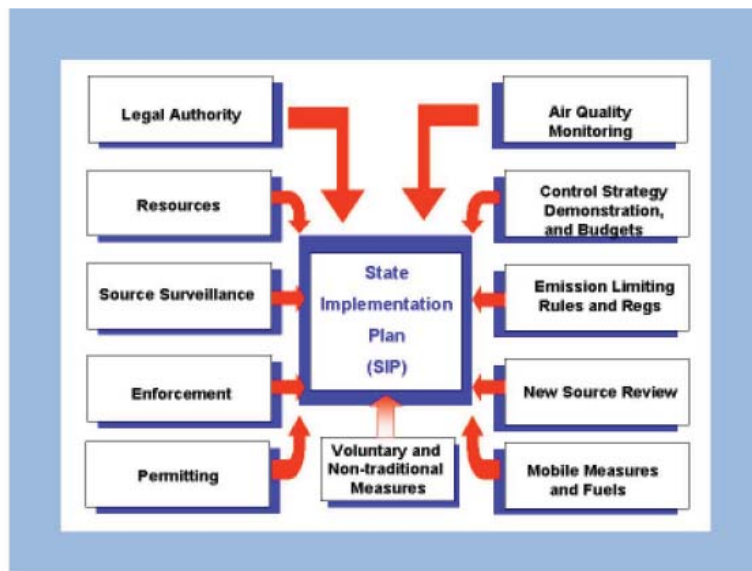


Figure 1. Components of the Maryland SIP

The *Maryland Smart Growth and Innovations SIP* is not a regulatory program; rather, it builds on guidance by EPA, introducing flexibility into the conformity process. This approach specifically concentrates on emission targets and not actual reductions, enabling state and local agencies to make changes more easily when implementing the SIP. The SIP sets emission reduction targets for 2005 and 2025. The targets will be implemented using an approach similar to stationary source cap and trade or budget concepts. Emission reduction targets are also analyzed according to future alternatives, such as anticipated growth based on different land use patterns.

Outcomes

Developing the SIP included many challenges, including:

- the need to coordinate and develop consensus among many stakeholders;
- the disconnect between a short-term time frame in the development of SIP and the long-term time frame in land use initiatives and conformity;
- the ability to capture and quantify non-air quality benefits; and,
- the need for inter-agency cooperation in capturing significant and nontraditional data.

1.3 Local Air Quality Planning Challenges: A Regional Planning Agency/ Metropolitan Planning Organization Perspective



Lindy Bauer
MAG

www.mag.maricopa.gov

Background

MAG serves as the MPO for the Phoenix, AZ area, and conducts comprehensive regional planning for the entire area over which it has jurisdiction, covering approximately 9,000 square miles. In 2000, the population was 3.1 million, with record population growth expected in excess of three percent annually. MAG estimated the average weekday vehicle miles traveled (VMT) at 69.8 million throughout the region.

MAG plays an important role in regional transportation and air quality planning and is responsible for achieving transportation conformity requirements. In executing its air quality planning functions, technical modeling is one of the most important functions at MAG, providing the necessary information for policy development.

Overview

MAG works closely with other air quality planning agencies through an Air Quality Memorandum of Agreement (MOA) between the different agencies providing a framework for coordinated decision-making in planning, implementation and enforcement of air quality actions. The parties involved in the MOA include MAG, the Arizona DEQ, the Arizona DOT and the Maricopa County Environmental Services Department.

MAG uses state of the art regional modeling tools to develop socioeconomic, land use, transportation and air quality simulations. MAG also develops data used as input into the travel demand model, including land use forecasts and population and employment projections. In addition, MAG uses air quality emission factor models to analyze the air quality impacts of transportation projects and Urban Airshed Models (UAM) to project emissions for use in regional air quality plans. The expertise in transportation and air quality modeling enables MAG to quickly respond to its member agencies on regional plan analyses.

The Maricopa County area is classified as a serious nonattainment area for three pollutants, carbon monoxide (CO), Ozone, and PM10. Of the three pollutants, PM10 is the most difficult to control. In February 2000, the *Revised MAG 1999 Serious Area Particulate Plan for PM10* was submitted to EPA. The Plan includes 77 stringent control measures to curb particulate pollution, fugitive dust and mobile dust sources. The control measures that are expected to have the largest percent reduction emissions in an average day in 2006 include:

- strengthening and better enforcement of fugitive dust control rules (19.1 percent);
- strengthening and better enforcement of fugitive dust control rules for track-out and paved road dust (9.7 percent);
- reducing particulate emissions from unpaved roads and alleys (5.8 percent);
- reducing particulate emissions from unpaved parking lots (1.8 percent);
- reducing particulate emissions from vacant disturbed lots (0.9 percent);
- PM10 efficient street sweepers (0.5 percent);
- curbing, paving or stabilizing shoulders on paved roads (0.5 percent); and
- paving, vegetating and chemically stabilizing unpaved access points onto paved roads (0.2 percent).

Future air quality activities planned at MAG include a carbon monoxide maintenance plan, ozone maintenance plan for 1-hour standard, ozone plan for 8-hour standard and conformity analyses.

Outcomes

Challenges to reaching conformity include:

- preventing transportation plans, programs and projects from causing or contributing to a violation, increasing the frequency or severity of any existing violation, or delaying the timely attainment of the standard; and
- staying current with new federal conformity rules and regulations, particularly following court rulings.

The following experiences were shared by MAG on the integration of air quality and transportation planning:

- implementing funding for transportation control measures beyond those assumed in air quality plans allows for additional emission reduction credits to be applied, if needed, during conformity analysis;

- consulting with appropriate local, state and federal interagency partners is an important factor in success;
- working with federal agency staff is very helpful in resolving complex issues related to conformity; and
- possessing its own modeling expertise has allowed MAG to view the “big picture” enabling the agency to respond quickly to needs throughout the region.

1.4 Looking at Transportation Conformity Issues from the Federal Perspective



U.S. Department of Transportation
Federal Highway Administration

Daniel Wheeler

FHWA

www.fhwa.dot.gov

Background

From the federal perspective, conformity issues are multiple and complex because air quality varies from one MPO to another. Important issues include NAAQS, nonattainment status and how the federal government and public should involve themselves in the air quality conformity process.

Overview

An MPO or COG facing nonattainment is charged with the responsibility for determining how its geographic area can achieve conformity. Determining how an area achieves conformity is compounded by resolving which air quality standards are applicable to a particular region. Although the conformity process is complicated, it has initiated a more integrated transportation and air quality planning process. Additional information for MPOs seeking assistance with conformity determination can be found by visiting the FHWA’s website, www.fhwa.dot.gov. The same website contains Congestion Mitigation and Air Quality Improvement Program (CMAQ) background information and resources, as well as information about application procedures and eligible projects.

Outcomes

MPOs are given the task of determining which air pollutants are affecting their region and how they can achieve conformity.

1.5 Transportation Conformity: A State Department of Transportation Perspective

State of Rhode Island
Department of Transportation

Paul Silva

Rhode Island DOT

www.dot.state.ri.us

Background

Rather than developing multiple transportation improvement plans (TIPs), the Rhode Island DOT houses the Rhode Island MPO, which develops one Statewide Transportation Improvement Plan (STIP). In order to reach air quality conformity, the state took an aggressive stance in setting goals and seeking funding for a cooperative planning effort that included the MPO as well as the Air Resource Agency. The state’s conformity goals include reducing emissions, establishing strong interagency working relationships, ensuring continued transportation funding, fostering teamwork amongst stakeholders and making use of the SIP periodic inventory to assure the use of accurate planning assumptions.

Overview

The CAA requires that state and local agencies develop a periodic emissions inventory for ozone nonattainment areas classified as marginal or worse. The periodic emissions inventory is a tool used to monitor a nonattainment area’s progress in attaining the NAAQS. A periodic emissions inventory for ozone nonattainment area is required to contain emissions of ozone precursor pollutants, specifically

VOC, NOx and CO, from point sources, area sources, on-road mobile sources, non-road mobile sources and biogenic sources. A periodic emissions inventory is to be compiled every three years until attainment of the ozone NAAQS is achieved.

The MPO took the lead in collecting demographic data, as well as spearheading the extensive public participation process that was employed in the overall TIP update process. This relationship worked especially well when undertaking a major recomputing of the Transportation Demand Model using Census 2000 data.

Outcomes

Rhode Island's efforts have resulted in:

- high levels of public participation;
- year-round attention to the improvement of the procedures and products characterized by the state in their efforts to demonstrate conformity and produce an effective STIP; and,
- proactive investment of effort and resources by participating stakeholders.

1.6 Examining Potential Effects of Transportation Conformity Litigation on Regional Mobility



Background

The ozone nonattainment area for HGAC includes eight counties. The region is growing in population, employment, weekly transit trips and VMT. Today the regional population is approximately five million; by 2025 it is projected to reach a total of 7.6 million. These challenges, compounded with increasing congestion, make air quality planning difficult. The threat of litigation prevents HGAC from solving their congestion problems because time and money have been diverted from planning to lawsuits.

Overview

In August of 2000, the Environmental Defense Fund sued EPA, claiming that Houston's motor vehicle emissions budget (MVEB) was too high. The budget is used to demonstrate that future road projects will not increase road capacity in a manner that interferes with attainment of the ozone standard. Demonstration must occur at least every three years; if it does not occur, federal funding for new road construction is not provided. Houston's last MVEB allowed up to 283 tons of NOx per day (tpd). The pending conformity budget would allow 195 tpd. Due to the Environmental Defense Fund's litigation, the revised budget recommendations were 125 tpd.

The proposed settlement terms included a 156.6 tpd budget, which matches the rate of progress needed to be in attainment by 2007, including the development of a lower budget requiring additional transportation control measures.

The Environmental Defense Fund succeeded in using the lawsuit as leverage to negotiate further emissions reductions from mobile sources and the adoption additional of alternative projects, such as light rail segments, bike trails and the curtailment of certain perimeter road projects.

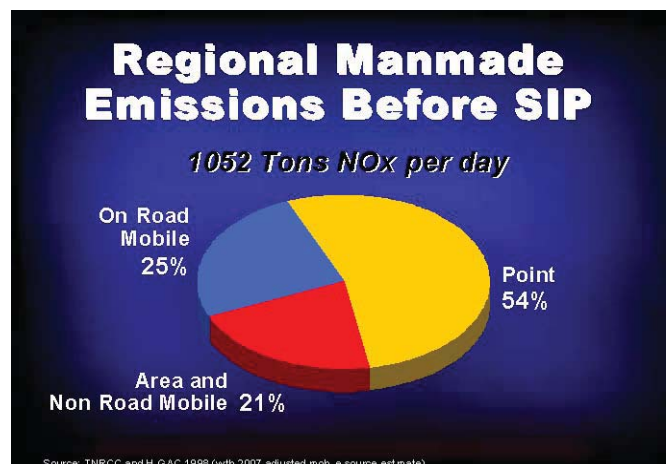


Figure 2. HGAC Manmade Nitrogen Oxide Emissions

Outcomes

HGAC confronted many issues throughout this process, including:

- no local entities being named as a defendant in the lawsuit;
- a lapse in conformity that halted road and highway construction; and
- settlements provided plaintiff organizations with the ability to dictate which projects could be built, encouraging them to continue to go after planning organizations in the future.

1.7 The Legal Ramifications Of Litigation: An MPO Perspective



ATLANTA REGIONAL COMMISSION

Charles Krautler

ARC

www.atlantaregional.com

Background

ARC is the MPO for the Atlanta region covering a ten county, 64-city area. The region has been involved in various litigation over the last five years related to conformity. The Clean Air Act Amendments (CAAA) include a citizen suit provision, allowing groups or individuals to file suit in federal court on concerns over transportation and air quality, allowing the plaintiff to be reimbursed for their legal expenses if they prevail. Due to this clause, numerous organizations have filed suits against MPOs, and state and federal regulatory agencies in an effort to overturn or modify decisions relating to SIPs, TIPs and regional transportation plans.

Overview

Multiple legal actions have been brought against federal, state and regional entities as a result of:

- EPA's adequacy finding for new motor vehicle emissions budgets MVEB;
- EPA approval of a revised attainment demonstration; and,
- EPA approval of a long-range plan in transportation.

In 2001, a suit was filed against the U.S. DOT, the Georgia DOT and ARC, over conformity determination for the area's 2025 Long Range Transportation Plan (LRTP) and 2001-2003 TIP. The plaintiffs claimed that ARC used inaccurate and outdated data in its models and that the plans were not fiscally constrained. The suit maintained that FHWA and the U.S. Department of Transportation Federal Transit Administration (FTA) did not provide adequate opportunity for public comment before approving the conformity determination. The plaintiffs requested an injunction, which was denied by the court, to stop the 138 road projects identified in the TIP until the case came to a resolution.

In that same year, EPA was sued again for failure to move the Atlanta region from serious nonattainment into severe nonattainment classification. This case was dismissed.

This following information was updated following the results of the suit in 2002.

In early 2002, EPA was sued over the adequacy finding for MVEBs, which resulted in a stay or status quo of the budgets. This lawsuit was also eventually dismissed, as the conformity determination for the 2025 LRTP was performed against older budgets and found adequate. EPA's decision to approve an updated attainment demonstration was also challenged in 2002. EPA eventually requested that the decision to approve the SIP be vacated. The request was granted, with the legal action withdrawn, the Atlanta region was reclassified as a severe nonattainment area.

Following the reclassification in late 2002, the Court found in favor of the ARC, in the suit regarding the conformity determination for the area's 2025 LRTP and 2001-2003 TIP.

Outcomes

Challenges identified throughout this process include:

- the need for Congress to adequately address the issues under the CAAA that appear to negatively affect the regional planning process, including EPA's ability to issue attainment extensions; and
- the acknowledgement that the requirements for severe nonattainment areas often are either impossible to meet or counterproductive.

1.8 Noted Gaps Between Air Quality and Transportation Planning: A COG Perspective



Michael Morris
NCTCOG
www.nctcog.org

Background

NCTCOG is responsible for the overall activities of the region's program, including the implementation of the LRTP, *Mobility 2025*, the TIP and the air quality-related TCM of the SIP.

Overview

Several gaps between air quality and transportation planning have been identified, including:

- differences between skill and technical tools;
- differences in time frames;
- software problems;
- differences in aggregate tools;
- differences in incentives to build air quality projects and planning for SIP;
- a lack of effort in conducting 'before and after' studies; and
- a lack of planning for inconsistencies and phasing.

Several strategies that were recommended as a way to avoid litigation included:

- identifying the source of the problem by dissecting emissions models;
- implementing a strong technical foundation to advocate for your region;
- ensuring aggressive TCM as well as timely implementation of air quality strategies; and,
- cooperating and sharing between stakeholders and between different regions.

Outcomes

To achieve success, the challenge is to answer the following questions:

- What data or software is needed to help?
- What will conformity look like in the future?
- What technology is needed for the future?
- What is the difference between those who are being sued and those who are not?
- What are these areas doing about tools, expertise and planning processes?
- What are some recommendations to deal with particular issues?

Workshop Two, October 29, 2001: Smart Growth and Alternative Land Use Planning

NARC held its second in a series of workshops on integrating air quality and transportation planning in Atlanta, Georgia, on October 29, 2001. This workshop provided multiple perspectives on relating land use projects and policies to air quality and transportation planning.

In this workshop, COGs, MPOs, state agencies, the EPA and the FHWA discussed how COGs and MPOs can use land use strategies, incentives, and other options to achieve a healthy balance of transportation investments and clean air.

The main questions addressed include:

- What are the linkages between land use strategies, air quality and transportation planning?
- How are MPOs and COGs implementing land use strategies as part of their air quality and transportation planning process?
- What are some of the elements that ensure the successful implementation of land use strategies in TIPs and SIPs?
- How does the federal government view alternative smart growth and land use strategies as a technique for achieving healthy air?

Workshop two described the importance of incorporating land-use strategies into air quality and transportation planning. It examined the benefits of utilizing smart growth policies to improve or maintain air quality, and also emphasized the need for states to implement these policies into planning documents such as TIPs and SIPs.

Workshop Topics and Presenters

- 2.1 Integrating Growth Management into Transportation Plans
Annette Liebe, Portland Metropolitan Council (Metro), highlighted Metro's smart growth program and how it is integrated into the SIP, TIP and regional transportation plan (RTP).
- 2.2 Land Use, Air Quality and Transportation in North Carolina
Janet D'Ignazio, North Carolina DOT, examined the challenges confronting North Carolina DOT as they integrated air quality and transportation with land use planning.
- 2.3 Slow but Smart in Philadelphia: Air, Transportation and Land Use Planning Strategies
Barry Seymour, Delaware Valley Regional Planning Commission (DVRPC), looked at smart growth and alternative land use in the greater Philadelphia region, specifically examining the strategies included in their regional plan *Horizons 2025*.
- 2.4 MPO Overcomes Fragmented Land Use Strategies and Achieves a Regional Air Policy
Don Willard, Mecklenburg County Department of Environmental Protection (DEP), looked at ways in which the Mecklenburg area overcame fragmented land use planning to move towards a regional clean air policy.
- 2.5 The Tools of Effective Planning: Air, Transportation and Land Use Planning
Dan Reuter, ARC, examined ARC's 2025 RTP and the main initiatives it presented in response to Atlanta's air quality and transportation planning challenges.

- 2.6 Region 2020: Shaping Our Future, Setting the Framework for Smart Growth
Mike McLaughlin, San Diego Association of Governments (SANDAG), reviewed SANDAG’s plan for improving air quality through smart growth strategies.
- 2.7 EPA’s Voluntary Guidance on Land Use and Air Quality: An Overview
Alan Powell, EPA, provided an overview of EPA’s guidance on land use and air quality, as well as strategies, incentives, and accounting measures that are useful in addressing land use and air quality concerns.
- 2.8 Improving Air Quality through Land Use Activities: Transportation Conformity
Gary Jensen, FHWA, discussed transportation conformity aspects of EPA’s guidance on improving air quality through land use activities.

2.1 Integrating Growth Management into Transportation Plans



Annette Liebe

Portland Metropolitan Council
www.metro-region.org

Background

In 1979, Portland, Oregon voters created Metro, the first elected regional metropolitan council responsible for urban planning in the U.S. Metro is composed of several committees, including the Joint Policy Committee on Transportation (JPACT), the Transportation Policy Advisory Committee (TPAC), the Metro Policy Advisory Committee and the Metro Technical Advisory Committee. These committees work together to address growth management strategies within the Portland area, maintaining consistency within the SIP, RTP and TIP.

Overview

In the early 1990s, Metro reviewed four scenarios for the region’s growth, analyzing each for its effect on land consumption, travel times and distances, open spaces, air quality, and urban landscapes. From this analysis, Metro created the *2040 Growth Concept*, a balanced mix of infill and new urban reserve projects, including varied land use decision criteria such as increasing density in cities, creating business centers on major transit routes, protecting natural parks and farmlands, working with neighboring cities, and promoting diverse housing options. The *Growth Concept* document is referred to when developing and reviewing the SIP, TIP and RTP.

Oregon’s Land Use Planning Requirements

- 1973 Senate Bill 100 was approved and signed by Governor Thomas McCall, creating the Land Conservation and Development Commission (LCDC) and the Department of Land Conservation and Development (DLCD).
- 1977 State Legislature approved creation of the Metropolitan Service District, then referred it to the voters.
- 1979 Portland-area voters created Metro, the first U.S. elective metropolitan council, responsible for urban planning.

Figure 3. Oregon’s Land Use Planning Requirements

Metro’s efforts in developing Portland’s air quality SIP included: projecting future air quality limitations, creating balanced growth and emission reduction strategies, establishing mobile source emission budgets based on the RTP, identifying TCM and allowing for TCM substitutions. In allowing for TCM substitutions, Portland’s air quality plan requires alternatives to achieve equivalent emission reductions. In order to do this, Metro consults TPAC and JPACT and submits the substitutions for public review and approval from the Oregon Environmental Quality Commission, as well as EPA concurrence.

Some of the factors that led to reduced emissions in the Portland region were:

- enhanced vehicle inspection and boundary programs (30 percent reduction);
- parking rations, public education, and aerosols, paints and solvents (60 percent reduction); and,
- federal small engine and motorboat rules, as well as industry donations (four percent reduction).

Outcomes

Metro's strong leadership, knowledgeable public officials, institutional relationships, and sophisticated modeling and planning tools have helped to address the area's rapid regional growth, including Metro's TIP integrates multi-modal projects, geographic equity, *2040 Growth Concept* objectives and air quality tests.

2.2 Land Use, Air Quality and Transportation in North Carolina

Janet D'Ignazio
North Carolina DOT
www.ncdot.org



Background

North Carolina has a strong state-controlled decision-making process.

While the state has been proactive in its air quality and transportation planning efforts, it has faced numerous challenges in its land use decisions. The large number of MPOs in the state caused a fragmented planning process, making policy analysis and change difficult. This problem has been particularly prevalent in the three areas of Research Triangle Park, Triad and Metrolina, which have been 1-hour ozone nonattainment areas since the early 1990s. The inconsistent planning strategies became an increasingly important concern for North Carolina DOT when considering the new 8-hour ozone standard.

Overview

North Carolina DOT focused on four initiatives to emphasize the importance of a more informed and efficient decision-making process that could result from consolidation. These initiatives included:

- providing internal and external education and outreach through speeches, community workshops, articles, and sponsored events;
- providing technical assistance for long-term planning, including help with transportation models, multi-modal plans, coordination with downtown redevelopment, geographic information systems (GIS), and integrating environmental, economic development and transportation planning;
- supporting state legislation requiring MPOs to develop a single transportation strategy that will meet air quality requirements; and,
- actively participating in a statewide smart growth initiative by providing staffing and technical assistance to the newly established commission's transportation committee.

Outcomes

North Carolina DOT's approach to integrating air quality, transportation and land use planning included:

- encouraging regional solutions through consolidation, which ensures consistent and integrated land use, transportation and air quality planning; and
- developing a single transportation strategy to enable local areas to achieve conformity with the new 8-hour ozone standard.

2.3 Slow but Smart in Philadelphia: Air, Transportation and Land Use Planning Strategies



Delaware Valley Regional Planning Commission

Barry Seymour
DVRPC
www.dvrpc.org

Background

Serving the Greater Philadelphia region for over 30 years, DVRPC works to foster regional cooperation in a nine-county, bi-state area. This requires DVRPC to address the two states' differing methodologies and planning interpretations, particularly in the Philadelphia metropolitan region.

Overview

During recent years, the City of Philadelphia has rapidly decentralized, losing over 500,000 residents and experiencing social and fiscal disparities in the suburbs. DVRPC initiated a smart growth effort in its regional plan entitled, *Horizons 2025*, which seeks to address this issue by limiting new development to designated growth areas, encouraging infill and urban revitalization, fostering suburban development based on traditional design principles and preserving an interconnected regional open space network.

Furthermore, *Horizons 2025* incorporates various forms of smart growth by promoting strong pedestrian and transit orientations, combining a variety of uses and housing types, and creating links to open space preservation. An important part of this effort was to establish major public spaces or community facilities that could spawn opportunities to retrofit abandoned or under-performing shopping centers into community focal points. Other actions included the promotion of site design standards for parks and greenways, traffic calming techniques, bicycle paths and shared parking lots.

Outcomes

When integrating transportation planning with environmental and sustainable living, DVRPC had to address the challenging social and fiscal disparities among the region's communities. To do so, DVRPC:

- undertook qualitative and quantitative analyses;
- completed comparison studies of transportation improvement and regional plans with disadvantaged populations; and
- developed outreach and community involvement strategies.

2.4 MPO Overcomes Fragmented Land Use Strategies and Achieves a Regional Air Policy

Don Willard
Mecklenburg County DEP
www.charmeck.org/MecklenburgCountyNC



Background

The Charlotte/Mecklenburg region of North Carolina is comprised of one major city, six smaller municipalities and a population of over 600,000 people. The Mecklenburg region is the fastest growing area in North Carolina, and is in noncompliance with both the 1-hour and 8-hour NAAQS ozone standards. NOx are also a great source of pollution in the area. Addressing air quality issues on a regional basis is challenging because each municipality and city within the region has land use authority, often creating a disaggregated planning effort and complicating transportation plans.

Overview

In an effort to increase regional coordination, the Mecklenburg MPO introduced the *Breathe Initiative*, an education and outreach program to address the consequences the region would face if its land use and air quality planning remained fragmented and ignored. This initiative will work to achieve and maintain clean, healthful air as determined by national, state and local ambient air quality standards, as well as to provide benefits to its citizens and to contribute to the economic vitality of the community.

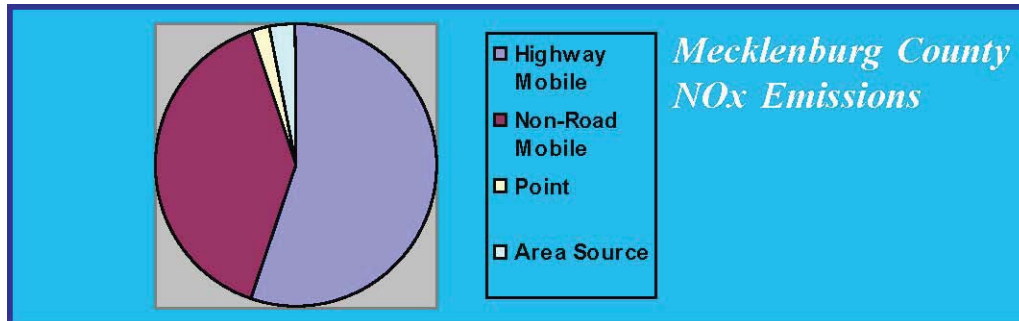


Figure 4.
Mecklenburg County
Nitrogen Oxide
Emissions

The Mecklenburg MPO employed several tactics to address the region's air quality issues, including:

- identifying and prioritizing specific issues relative to ozone levels and its precursor emissions specific to Mecklenburg County;
- developing a set of principles and quantifiable emission reduction strategies to be considered by the Board; and
- presenting recommendations for action to the Board of Commissioners.

Beyond the region's *Breathe Initiative*; smart growth, air quality and land use planning coordination at the local level was necessary to address the region's nonattainment status and growth. To accomplish this, the MPO developed incentives for land use authorities to act together, supported mechanisms for local governments to establish common goals and encouraged competition with individual right-to-use property. These efforts have increased collaboration between the city and municipalities, including a collaboration between Charlotte City Council and Mecklenburg County to develop a Clean Air Policy. The region also has an Official Environmental Forum comprised of eleven counties and fifteen municipalities spanning from North to South Carolina.

Outcomes

The Charlotte/Mecklenburg region's primary challenge in addressing air quality concerns was overcoming the fragmented land use policies. To confront this challenge, the region emphasized coordination among stakeholders, increased awareness and public education.

2.5 The Tools of Effective Planning: Air, Transportation and Land Use Planning



ATLANTA REGIONAL COMMISSION

Dan Reuter

ARC

www.atlantaregional.com

Background

ARC is the MPO for the Atlanta metropolitan region and is one of sixteen regional development centers in Georgia. The region is comprised of ten counties and covers 36 percent of the state's population. Since the 1990 census, the Atlanta region's population increased by over one million people, representing one of the highest growth rates in the country, increasing the need to integrate ozone conformity requirements with land use and transportation planning.

Overview

To address this challenge of population growth and VMT, ARC focused on its RTP. Strategies in this plan include: adding 220 miles of high-occupancy vehicle (HOV) lanes, 700 buses, 250 rail miles, and 2,700 miles of new bike and pedestrian facilities, along with investments in rideshare programs, roadway systems and land use initiatives.

The RTP also examined the region's policy regarding growth in specific areas such as town and activity centers, MARTA, and small watersheds. A land use task force was utilized to provide modeling guidance.

Within the 2025 RTP, as a reaction to the U.S. DOT's concern regarding the implementation of proposed land use policies, ARC established three main initiatives to coordinate land use planning with population growth and transportation planning.

1. Both ARC and the Georgia Regional Transportation Authority adopted the Land Use Coordinating Committee, which sought to emphasize the importance of land use planning and developing strategies with local, state and other interests.
2. ARC established the Livable Centers Initiative (LCI) to provide planning studies and transportation project investments in town and activity centers with \$5 million to fund five years of studies and \$350 million in funding to invest in the centers.
3. ARC established a program called Community Choices to expand the availability of information on quality growth and the range of options for development choices.

Outcomes

The Atlanta region's rapid population growth created the need for action among local officials to overcome their air quality and transportation obstacles. The region engaged in three separate initiatives to work on these problems, including the Land Use Coordinating Committee, Livable Centers Initiative and Community Choices.

2.6 Region 2020: Shaping Our Future, Setting the Framework for Smart Growth



Mike McLaughlin

SANDAG

www.sandag.org

Background

San Diego is a fast-growing region with an expected 32 percent increase in population, 24 percent increase in employment and 35 percent increase in housing by 2020. SANDAG's *Region 2020*, a regional transportation and land use report, was created to set the framework mobility, population increase and commercial growth within the region. *Region 2020* is primarily focused on transportation and housing with a balance of economic, environmental and fiscal strategies. The San Diego region is designated an 8-hour ozone nonattainment area operating under a SIP.

Overview

Consequences of inaction in times of major growth include decreased open space, fewer housing options, and increased pollution, congestion, energy consumption and cost of public services. By emphasizing smart growth, SANDAG seeks to encourage compact, efficient and environmentally sensitive development. Local governments address environment, land use, travel choice and amenities, while SANDAG addresses transportation and economic incentives and indicators at the regional level.

Region 2020 also rewarded smart growth initiatives by directing transportation funds toward smart growth opportunity areas. Local governments have also rewarded smart growth by offering density bonuses and tax credits and modifying zoning. SANDAG also reprogrammed \$500 million to urban systems and incorporated smart growth criteria into its project evaluation process. In *Region 2020*, SANDAG introduced more trolley lines, wider freeways, commuter bus services, efficient land use patterns that will decrease VMT, reductions in peak traffic demand via flexible work hours and a region-wide system of HOV lanes, and advances in technology integral to the regional transportation system.

Outcomes

Region 2020 highlights how smart growth can be incorporated into a community's efforts to address quality of life, congestion, and mobility. Although SANDAG has moved toward planning smart growth and healthier transportation initiatives, implementing the projects will be both expensive and time consuming.

SANDAG's plans for successful implementation include:

- tailoring land use decisions to connect housing with jobs, services, and transportation, and focus future growth away from rural areas; and
- educating community leaders and decision-makers about the benefits of smart growth initiatives.

2.7 EPA's Voluntary Guidance on Land Use and Air Quality: An Overview

Background

EPA land use guidance asserts a clear connection between development patterns, air quality and transportation. These three areas share a symbiotic relationship and a change in one will likely result in a change in the others. For example, when land use changes, related driving patterns change which impacts emissions coming from vehicles. Increases in VMT can impact progress on measures to counteract ozone. The VMT in the ten largest metro areas increased significantly during the years 1982-1996.

Overview

EPA's land use guidance supports several strategies, including infill development, mixed use development, parking management policies, transit oriented development projects and urban growth boundaries. Moreover, EPA's land use guidance provides several options for states in accounting for land use activities related to air quality and transportation planning and serves as a tool for states that choose voluntarily to employ a land use strategy for reducing mobile source emissions. It also offers an incentive for states to further smart growth goals by showing benefits through the air quality and transportation planning.

New York/NE New Jersey – 39.85%
Los Angeles – 52.83%
Chicago/NW Indiana – 79.47%
Philadelphia – 41.41%
San Francisco/Oakland – 50.87%
Detroit – 46.70%
Washington, D.C. – 77.94%
Houston – 54.36%
Boston – 31.44%
San Diego – 83.82%



Figure 5. Increase in VMT in Metro Areas

EPA's guidance presents three ways to account for the linkage between land use and air quality.

1. The future impacts of beneficial land use activities can be modeled for the SIP, reducing the amount of emissions control that is needed.



Alan Powell
EPA

www.epa.gov

2. The air quality benefits of land use policies that reduce driving trips and distances or encourage alternative modes of transportation can be accounted for as a SIP control strategy.
3. Future impacts of land use activities can be modeled for the conformity determination without including it in a SIP.

Outcomes

The connection between development patterns, air quality and transportation are not always clearly understood at the local level. EPA's guidelines are designed to help clarify the linkage between land use and air quality.

Related modeling work can be found at the following sites:

DOT microscale and regional modeling and emissions models:

<http://www.fhwa.dot.gov/environment/models.htm>

EPA Office of Policy Smart Growth Index model:

http://www.epa.gov/piedpage/topics/sg_index.htm

Institute of Transportation Engineers trip generation report:

<http://www.ite.org/tripgen/triparticles.asp>

2.8 EPA's Voluntary Guidance on Land Use and Air Quality: An Overview



U.S. Department of Transportation

Federal Highway Administration

Gary Jensen

FHWA

www.fhwa.dot.gov

Background

Conformity, which requires federally supported transportation investments to be consistent with the air quality goals in SIPs, applies to metropolitan transportation plans, TIPs, and projects funded or approved by the FHWA or the FTA. Conformity is particularly important when an area is a nonattainment or maintenance area for ozone, CO, particulate matter or nitrogen dioxide.

Overview

EPA's guidance generally captures how land use activities are currently being included within conformity determinations. Areas should use this guidance as reference when new and existing land use activities are introduced and implemented. The interagency consultation process should be undertaken to ensure that this guidance is followed for new conformity determinations. Land use assumptions and control strategies are applicable in conformity determination. Both land use assumptions and control strategies affect the location of population and employment, and therefore they should be integrated before running the transportation model for the regional analysis. Regardless of whether land use activities are considered as land use assumptions or control strategies, it is necessary to have an assurance that the land use activities will occur before including them in the conformity determination.

Outcomes

If there is doubt as to which category fits a particular project or policy best, then land use assumptions should be discussed with other participants during the interagency consultation process. Regardless of whether a land use activity is called an assumption or a control strategy, it must be based in reality. If the land use forecast differs significantly from past trends, there should be adequate justification for the change. For more information on conformity, see FHWA's website:

<http://www.fhwa.dot.gov/environment/conform.htm>.

Workshop Three, March 26, 2002: Conformity Case Studies

NARC held the third in a series of workshops addressing integrating air quality and transportation planning in Washington DC, on March 26, 2002. This workshop provided participants with case studies on air quality conformity from both large and small COGs and MPOs.

COGs and MPOs often struggle with the challenges of conforming to air quality standards, such as defining the problem, building effective partnerships, overcoming legislative and legal barriers, and addressing land use issues and technical limitations. The case studies in this workshop explored the procedural, institutional, and technical aspects of achieving conformity and provided a better understanding of the fundamentals of air quality planning.

The questions addressed include:

- Is problem definition important when trying to find solutions to air quality challenges?
- How can interagency partnerships improve the conformity process?
- How can legislative and regulatory barriers to conformity be overcome?
- What are MPOs and COGs doing to overcome any technical or data limitations associated with achieving conformity?
- How can transportation modeling be improved to help achieve conformity?

Workshop three presented several case studies on the issue of conformity and how COGs and MPOs have approached air quality planning. Workshop presenters placed an emphasis on defining the problem, building interagency partnerships, addressing technical limitations and implementing smart growth strategies as ways to achieve conformity.

Workshop Topics and Presenters

- 3.1 Conformity Case Study: Identifying the Problem and Developing Control Strategies in North Central Texas
Chris Klaus, NCTCOG, explained how NCTCOG addressed its region-wide nonattainment designation by properly identifying the region's on-road mobile emission sources and developing local solutions.
- 3.2 Defining the Conformity Problem Leads to Clearly Established Goals and Effective Solutions
Joan Rolf, Metropolitan Washington Council of Governments (MWCOG), illustrated that the process of thoroughly defining problems can lead to the establishment of goal-setting by MPOs and COGs when dealing with conformity.
- 3.3 Interagency Partnerships Create Regional Consensus around Conformity
Jane Hayse, ARC, described ARC's interagency consultation process to address conformity issues and facilitate more efficient air quality planning.
- 3.4 Producing Results in the Conformity Review Process: A COG's Partnership
Chris Klaus, NCTCOG, illustrated how interagency cooperation produces tangible results in the conformity review process.
- 3.5 The Benefits and Challenges of an Inspection and Maintenance Program
David Heller, North Jersey Transportation Planning Authority (NJTPA), discussed the benefits and challenges of inspection and maintenance programs in reaching conformity.

- 3.6 **Building Links: Air Quality and Land Use Planning: First Steps in the WILMAPCO Region**
Ted Matley, Wilmington Area Planning Council (WILMAPCO), described public outreach efforts in Delaware and Maryland to integrate smart growth into the transportation and air quality conformity process.
- 3.7 **Smart Growth San Diego Style: Choices Connecting Transportation and Land Use**
Marnie Cox, SANDAG, illustrated how SANDAG's *Research Development Plan* addresses regional growth and air quality problems by encouraging smart growth strategies.
- 3.8 **SEMCOG: Overcoming Technical Limitations to Achieve Attainment Under the 8-Hour Ozone Standard**
Paul Tait, Southeast Michigan Council of Governments (SEMCOG), explored the technical limitations SEMCOG encounters when working toward achieving attainment under the new 8-hour ozone standard.
- 3.9 **Conformity Analysis: A Smaller Agency's Experience in Overcoming Lack of Data to Achieve Conformity**
Saleem A. Salameh, KYOVA Interstate Planning Commission (KYOVA), examined how KYOVA overcame its lack of available data to achieve air quality conformity.

3.1 Conformity Case Study: Identifying the Problem and Developing Control Strategies in North Central Texas



Chris Klaus
NCTCOG

www.nctcog.dst.tx.us

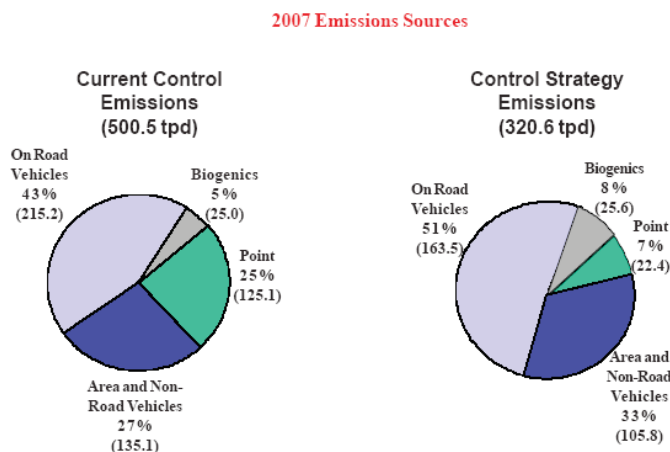
Background

NCTCOG's transportation department is responsible for the overall activities of the region's LRTP, including preparation of an air quality conformity analysis. The regional SIP identified on-road vehicles as Dallas/Fort Worth's largest source of emissions. In addition, vehicle travel to and from work accounted for 80 percent of the trips taken in the region. To address this issue, NCTCOG used a variety of tools to identify vehicular and emission trends.

NCTCOG developed regional reduction strategies to reduce on-road mobile emission sources and found that a set of specific actions and activities led to a large portion of the associative emissions. NCTCOG believes that by reducing the emissions associated with the small outliers, the region will be one step ahead of meeting both the 1-hour and 8-hour ambient air quality standards.

Overview

Using the MOBILE vehicle emission factor model software, NCTCOG examined VOC and NOx emission trends by speed and vehicle type. NCTCOG then developed emission reduction control strategies based on predominant trends depicted in each curve.



Source: DFW Attainment Demonstration, TNRC, April 2000, Table 6-1 DFW NOx Reduction Estimates

Figure 6. Emissions Sources for the Dallas-Fort Worth Nonattainment Area (2007)

NCTCOG implemented the High Emitting Vehicle Assistance Program (HEVAP), a new program to reduce gross polluting vehicles funded through the state and the region's transportation policy body. HEVAP included educational, vehicle detection, enforcement, research and incentive components.

NCTCOG also implemented a variety of traditional mobile source emission reduction measures such as HOV lanes, grade separations, park-and-rides and vanpools, as well as voluntary measures like clean vehicles, sustainable development and employer trip reduction measures.

DFW Emissions Reduction Programs		
Mobile Source Emission Reduction Control Strategies		
Transportation Control Measures (TCM)	Intersection Improvements	775 Locations
	Bicycle/Pedestrian Facilities	710 Miles
	HOV Lanes	76 Miles
	Rail	97 Miles
	Grade Separations	15 Locations
	Park-n-Ride	8,236 Spaces
	Vanpools	547 Vehicles
Voluntary Mobile Emission Reduction Strategies	Clean Vehicles	3,700 Vehicles
	Sustainable Development	Regional
	Employer Trip Reduction Measures	Regional
	Vehicle Retirement/Maintenance	2,500 Vehicles per year
	Public Education/Ozone Season Fair Reduction	Regional
Transportation Emission Reduction Measures (TERM)	Traffic Signal Improvements	3,565 Locations
	Intelligent Transportation Systems	350 Miles Covered
Alternate Measures	Bottleneck Removal	
	CMAQ Projects	

Figure 7. Dallas-Fort Worth Mobile Emissions Programs and Control Strategies

All of these emission reduction efforts were itemized by a specific funding source. For example, intersection improvements and high emitting vehicle programs were funded through the Congestion Mitigation and Air Quality (CMAQ) Improvement Program while transportation and land use outreach efforts, air quality education programs, and vanpools were funded through the Surface Transportation Program and Metropolitan Mobility funds.

Outcomes

NCTCOG undertook efforts to clearly identify the emission problems that contribute to poor air quality and formulated a variety of targeted strategies to best address the problems. Through this approach, the organization was able to itemize funding sources, thus ensuring that the targeted strategies would be enacted.

3.2 Defining the Conformity Problem Leads to Clearly Established Goals and Effective Solutions

Background

MWCOG consists of 18 local government members in the Washington, DC metropolitan region. The Metropolitan Washington Air Quality Committee (MWAQC) is a multi-

Joan Rolf
MWCOG
www.mwcog.org



Metropolitan Washington
Council of Governments

state planning body for the jurisdictions of the District of Columbia, Maryland and Virginia. It is MWCOG's primary committee coordinating air quality planning activities for the 1-hour ozone standard in this designated nonattainment area. MWAQC coordinates air quality planning activities with other external committees; the MWCOG Transportation Planning Board reviews policies, resolves policy differences and adopts an air quality plan for transmittal for the District of Columbia, Maryland DOT and Virginia DOT.

Overview

During the problem definition portion of conformity planning, MWCOG identified data errors that resulted in an overestimation of emission projections. The largest data error involved light duty trucks that were incorrectly recorded as passenger cars by the Virginia DOT, causing data mismatches. MWCOG's ability to identify data errors not only enabled them to meet the challenges associated with increasing VMT trends, but also allowed them to confront challenges involving new mobile emission ceilings found in the region's transportation plan. After this problem was identified and fixed, MOBILE 6 was used to revise the SIP by setting new mobile budgets, adopting other transportation control measures, allowing for VOC and NOx substitution, and permitting NOx trading.

Outcomes

Challenges MWCOG encountered in its conformity planning were:

- increasing VMT trends, which call for long-term emission reduction measures; and
- a limit to the kind of projects considered acceptable. (For example, projects that add to existing air pollution will not be funded).

To address these challenges, MWCOG has undertaken park and ride facilities, compressed natural gas buses, and voluntary options such as commuter choice, ride sharing and teleworking measures.

3.3 Interagency Partnerships - Federal, State and Local - Create a Regional Consensus around Conformity



ATLANTA REGIONAL COMMISSION

Jane Hayse

ARC

www.atlantaregional.com

Background

Comprised of 10 counties, ARC is one of 16 planning organizations in the State of Georgia. During the implementation phase of its TIP, ARC must consult and coordinate with an interagency partnership, including EPA, Georgia Environmental Protection Department, FHWA, FTA, Georgia DOT and MARTA.

Overview

Between 1998-2001, the number of times the Atlanta region exceeded the 1-hour and 8-hour ozone standard declined, yet the area still struggled to achieve conformity. In 2001, there were three 1-hour and 20 8-hour ozone standard violations. However, according to EPA's Air Quality Index, the number of unhealthy air days for sensitive groups decreased over the same period. To address the intensity of the situation, the development of citizen and expert task forces were pursued, and eventually evolved into an interagency forum to address conformity issues.

Coordination among partners shaped the criteria selection process and other procedures for air quality conformity. ARC created an MOA, detailing that any remaining concerns be reviewed by the Air Quality Partners Group, made up of all agency heads, and finally by the Governor if consensus on implementation has not been reached.

Outcomes

ARC shared the following experiences on its interagency partnerships.

- Fostering a partnership with the state air agency is important when developing the motor vehicle emissions budget.
- Structuring the interagency consultation process to achieve consensus can help ensure a cohesiveness that overcomes future changes to the federal CAA.
- Designating one agency to take the lead in staffing the interagency meetings can improve consistency.

3.4 Producing Results in the Conformity Review Process: A COG's Partnership



Chris Klaus
NCTCOG

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Background

NCTCOG serves a 16-county region of North Central Texas, including the two urban centers of Dallas and Fort Worth. It has over 230 member governments including all surrounding counties, numerous cities, school districts and special districts. NCTCOG utilized interagency cooperation and partnerships to enhance the efficacy of its Conformity Documentation Task Group (CDTG). Consultation partners for the CDTG included the EPA, Texas Natural Resource Conservation Commission, Texas DOT, FTA and FHWA.

Overview

The CDTG provided a forum for information sharing and problem solving while examining several areas subject to conformity analysis and working to establish a consistent conformity documentation process throughout Texas.

The CDTG had four main goals:

1. review Texas interagency consultation requirements;
2. establish a timeline and submission process;
3. identify information guidelines and checklists; and
4. develop a consistent documentation structure.

Through these efforts, the group was successful in creating several products ranging from on-road mobile control strategy nomenclature, pre-analysis consensus plans, information guidelines, a consistent documentation structure and a conformity process flowchart. CDTG assessed three mobile emissions reduction strategies which included:

- transportation control measures (projects to reduce on-road mobile emissions by decreasing vehicle use, changing traffic flow, and/or reducing congestion);
- voluntary mobile emission reduction measures (projects to complement existing programs and reduce mobile source emissions by changing public activities); and
- alternative measures (projects including additional emissions reduction measures not accounted for in the SIP, which may be used for substitution of local partnership).

The group also developed a pre-analysis consensus plan for the region that reviews metropolitan transportation plan (MTP) / TIP details, including demographics and affected counties, SIP related applicable budgets and control strategies, and mobile source emissions reduction strategies assessed using MOBILE 5 input parameters.

Outcomes

The CDTG succeeded in creating a checklist for information guidelines which included project listings, public, state, and federal involvement and emission estimates. It also developed a documentation structure establishing a conformity cycle and subsequent analysis under the MTP.

3.5 Conformity: The Benefits and Challenges of an Inspection and Maintenance Program



David Heller
NJTPA
www.njtpa.org

Background

Inspection and Maintenance (I/M) Programs are required under the federal CAA to help states meet air quality standards. They were of particular importance to NJTPA because this region was categorized as a severe nonattainment zone for CO² and ozone mobile emissions targets. In 1997, the EPA did not approve New Jersey's proposed ozone reduction plan because the State had fallen behind in implementing its I/M program and in 1998, New Jersey entered into an air quality conformity "freeze."

Overview

To avoid further sanctions, the NJTPA worked with the New Jersey (DEP) and the New Jersey DOT to develop an acceptable SIP, secure EPA approval and implement an enhanced I/M program in 24 months. The key component of the enhanced I/M program were tail pipe emissions tests conducted on a dynamometer, which simulated "actual" driving conditions.

Within six months of the beginning of the conformity freeze, NJ DEP recalculated SIP emissions budgets. Remedial actions targeting short-term emissions reductions, such as vehicle fuel caps and emission reductions from vehicle turnover, were also instituted. Over time, the funding for I/M programs has increased, with a greater percentage of CMAQ funds being devoted to this program.

Outcomes

The I/M program was one of the most cost-effective strategies for improving air quality. Annually, pollution from as many as 600,000 cars was reduced in a typical urban area. However, the I/M program only addressed air quality and not congestion issues.

Suggestions for the future included:

- utilizing technologies such as on-board diagnostic tests, oxygen sensors and actuators;
- more stringent state monitoring; and
- further research of I/M programs, land use activities and transit options such as light rail and/or feeder bus services that alleviate air pollution.

3.6 Building Links between Air Quality and Land Use Planning: First Steps in the WILMAPCO Region



Ted Matley
WILMAPCO

Background

WILMAPCO is comprised of two counties that are both designated as severe nonattainment areas; New Castle County, Delaware and Cecil County, Maryland. While each region manages its own air quality planning, WILMAPCO coordinates their conformity analysis. www.wilmapco.org

Overview

In order to tackle the conformity crisis in New Castle County, WILMAPCO joined legislative, business and environmental groups to promote awareness, review options in meeting conformity standards, and carry out public outreach efforts. WILMAPCO led the coalition's public outreach effort. In July 2001, on-board diagnostics, demographic changes, transit and other transportation control measures were incorporated into addressing the conformity issue. Public debate continued regarding the measures' efficacy as long-term strategies to improve air quality, protect public health and promote economic development.

In Delaware, WILMAPCO used the EPA Smart Growth Index model to review alternative plan scenarios. These included evaluation performance based on key indicators related to land use, transportation and air quality factors including a balance between jobs and housing, population density, growth compactness and housing transit proximity.

In Maryland, gaining public support to address the conformity problem is not a major problem as the state is a leader in smart growth initiatives. The state commits to collecting real data to evaluate the success of projects, transit ridership goals, designating growth areas and supporting policies against sprawl, thus generating air quality benefits.

Outcomes

By emphasizing the health aspects of clean air, WILMAPCO facilitated the implementation of long-term air quality strategies, congestion relief, transit support and community development. Land use, community design and smart growth are long-term air quality strategies that must be discussed in the short-term.

3.7 Smart Growth San Diego Style: Choices Connecting Transportation and Land Use



Marnie Cox
SANDAG

www.sandag.org

Background

SANDAG is the comprehensive planning organization in the San Diego, CA region.

It uses land use and sustainable development practices to mitigate traffic congestion and address issues related to housing, economic prosperity and open space. The San Diego area has experienced rapid growth with estimates of a 30 percent increase in population, 32 percent increase in civilian jobs and a 24 percent increase in housing between 2000 and 2020.

Overview

SANDAG's Research Development Plan (RDP) encourages smart growth while supporting measures that monitor air pollution. The San Diego RDP specifically focused on decreasing congestion, VMT, length of trips and air pollution.

With these smart growth actions, estimates include a 69 percent decrease in congestion on arterial roadways; a 22 percent decrease in vehicle hours traveled; and a 20 percent decrease in trip length. Matched with these benefits, an 11 percent drop in air pollutants is anticipated.

SANDAG undertook three specific actions to address growth in its region:

1. It reprogrammed \$500 million from rural projects to urban system highway projects.
2. Smart growth criteria were incorporated into the project rating process.
3. SANDAG included incentives in its RDP for signatory communities, neighborhoods and interest groups to include sustainable development activities in their planning.

Outcomes

In SANDAG's region, smart growth is rewarded in the following ways:

- at the local level - density bonuses, tax credits, modified zoning and streamlined permits;
- at the regional level - transportation funds; and
- at the state and federal levels - tax reform and transportation, housing and environmental funds.

3.8 SEMCOG: Overcoming Technical Limitations to Achieve Attainment under the 8-Hour Ozone Standard



Paul Tait
SEMCOG

www.semco.org

Background

SEMCOG is a regional planning partnership of 151 member local governments. It serves as the designated MPO in the seven-county greater Detroit area. Prior to 1995, SEMCOG was designated as an ozone nonattainment area. By implementing strategies identified in its ozone study, they successfully moved from a moderate ozone nonattainment area to attainment by 1999.

Overview

In planning for the new 8-hour ozone standard, SEMCOG evaluated the work and data required to maintain attainment status. Past strategies are no longer effective in addressing the longer averaging time and more stringent limit set forth by the new standard. SEMCOG already has several control measures in place, which resulted in a very low-level baseline to measure ozone, making

One-hour vs. Eight-Hour Values

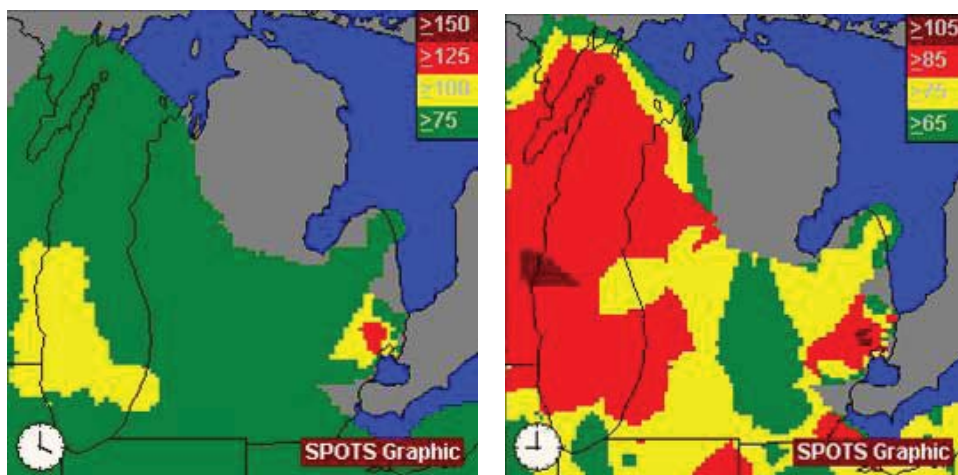


Figure 8. 1-hour vs. 8-hour Emissions Values for Michigan

it more costly to reduce each pound of pollution. Preliminary modeling also shows that more ozone precursor reductions are needed with the new 8-hour ozone standard to achieve the same ambient ozone reduction as in the past.

In addressing the 8-hour ozone standard, SEMCOG assessed the weekend effect. The number of 8-hour violations increased between Thursday and Saturday, although there were violations during the rest of

the week as well. Therefore, in the future SEMCOG will consider tailoring some strategies for weekends and others for weekdays.

Outcomes

SEMCOG reiterated the need for ozone precursor reduction measures. Its research shows that old technologies will not adequately lead regions to attainment status under the new ozone standard, and with other pollutants like PM 2.5 potentially on the “regulatory” horizon, proactive planning is a necessity. To meet the challenge of the tougher ozone standard, SEMCOG had to reevaluate the work and data required to maintain attainment status and include strategies for weekend effects.

3.9 Conformity Analysis: A Smaller Agency’s Experience in Overcoming Lack of Data to Achieve Conformity



Saleem A. Salameh
KYOVA

www.wvs.state.wv.us/kyova

Background

KYOVA is a nonprofit association serving southwestern West Virginia and southeastern Ohio. This bi-state metropolitan area was redesignated from a moderate ozone nonattainment area to a maintenance attainment area in 1994. With the change in status, KYOVA adjusted its proposed transportation projects to ensure attainment status in the future.

Overview

Transportation planning focused on projecting VMT for several horizon years spanning from 2002 to 2025. Historic trends showed that VMT increased linearly over time. This growth trend was then extrapolated to the horizon years using the travel-forecasting model, Quick Response System II (QRSII). Using these projections and the MOBILE5A emission factor modeling, area-wide NOx and VOC emission totals were calculated. Results showed that future area-wide mobile source for these two emissions would be less than the revised SIP emissions budget.

In 2001, EPA required KYOVA to use the latest planning assumptions using MOBILE6 and 5A models during air quality conformity planning. However, local vehicle registration data and other data were not available, so EPA indicated that national default data from 1996 would be sufficient for the MPO’s conformity analysis and SIP revisions.

KYOVA reached out to several agencies including EPA, FHWA, FTA, the West Virginia DOT, the West Virginia Office of Air Quality and the Ohio DOT to provide guidance on revisions to its SIP budget. When conformity lapsed in 2001, KYOVA reallocated the existing emissions budget to increase the highway NOx and VOC emissions and existing VOC control regulations were formally incorporated into the plan.

Outcomes

The primary challenge for KYOVA in overcoming the conformity lapse was the lack of available data. KYOVA emphasized the importance of interagency coordination to brainstorm and provide guidance when local data needed for conformity planning was lacking. Such collaboration assists with emissions budgets, conformity complications, technical strategies and SIP planning.

Workshop Four, June 25, 2002: Project Selection Criteria and Performance Measures

NARC held the fourth in a series of workshops addressing integrating air quality and transportation planning in Tuscon, Arizona, on June 25, 2002. This workshop examined how selection criteria and performance measures help MPOs and COGs realize their transportation planning objectives and guide the effective allocations of their CMAQ funding.

The Transportation Equity Act for the 21st Century (TEA-21) requires MPOs to apply fiscal constraint principles to projects in the TIP. This requires transportation planners to rely on selection criteria and performance measures to determine project selection while maintaining or improving air quality. Selection criteria are used to compare project alternatives and ultimately to recommend high-value projects for inclusion in TIPs. Performance measures evaluate the success and effectiveness of long-range plans in meeting stated goals.

The questions addressed by this presentation include:

- What are project selection criteria and how is it used in TIPs?
- How can collaboration improve project selection for the multi-modal TIPs?
- How can MPOs and regional councils effectively allocate CMAQ funding for projects and still protect the environment, promote economic development and manage transportation systems?
- What is the role of performance measures in project selection criteria?

Workshop four outlined the importance of selection criteria and performance measures in project selection and CMAQ funding allocation. It emphasized how these measures can help MPOs and COGs prioritize projects and achieve their regional transportation goals.

Workshop Topics and Presenters

- 4.1 Congestion Mitigation and Air Quality Improvement Program: Findings from the Transportation Research Board Special Report 264
Michael Meyer, Ph.D., Georgia Institute of Technology, reviewed the findings in the Transportation Review Board (TRB) Special Report 264, conducted in April 2002.
- 4.2 Collaboration Improves Project Mix in the Transportation Improvement Plan
Dan Rocha, NCTCOG, outlined NCTCOG's project selection process which emphasized collaboration between the State DOT and NCTCOG leading to improved quantity and quality of projects included in the TIP along with the region's air quality.
- 4.3 A Broad Mix of Innovative Projects Can Impact Air Quality
Diane Nguyen, San Joaquin Council of Governments (SJCOG), explained how SJCOG developed a mix of traditional and innovative projects to positively impact air quality levels. She focused on the opening of CMAQ funds to bus fleets and the process of consensus building among stakeholders.
- 4.4 Transportation-Based Performance Measures are Integral to Program Evaluation
Jim Wild, East-West Gateway Council of Governments (EWCOG), examined the importance of performance measures in program evaluation and provided an overview of six commonly recommended transportation-based performance measures.

- 4.5 Comprehensive Planning: A Way to Encourage Commitment and Input in the TIP Project Selection Process
Jane Hayse, ARC, discussed ARC's inclusive, organized project selection process and its impact on regional transportation goals.
- 4.6 Incorporating Environmental Justice to Improve Air Quality and Transportation
Daniel Gardner, Northwestern Indiana Regional Planning Commission (NIRPC), illustrated how NIRPC incorporated environmental justice considerations into its regional planning process. The workshop also examined how incorporating these considerations can strengthen the air quality and transportation planning process.
- 4.7 Look toward Committees to Effectively Rank, Evaluate and Monitor Projects
Patricia Berry, Chicago Area Transportation Study (CATS), demonstrated how CATS' committee structure ranks, evaluates and monitors transportation projects.

4.1 Congestion Mitigation and Air Quality Improvement Program: Findings from the TRB Special Report 264



Background

Special Report 264 – The Congestion Mitigation and Air Quality Improvement Program: 10 Years of Experience was carried out by the National Academies' TRB in response to a Congressional request to determine whether CMAQ funding programs were cost-effective and successful in reducing air pollution and congestion.

Michael Meyer, Ph.D.
Georgia Institute of Technology
www.gatech.edu

Important questions discussed within Special Report 264 include:

1. How well is the program meeting its primary goal of improving air quality?
2. Should more attention be paid to congestion alleviation as an important program policy goal in its own right?
3. Can desired program outcomes, such as reduced motor vehicle trips, travel, vehicle emissions, and pollutant concentrations be measured?
4. Should the program be broadened and project eligibility expanded to cover new pollutants and emission reduction strategies?

Overview

CMAQ's main focus has consistently been air quality improvement, with spending concentrated on transit (44 percent) and traffic flow improvements (33 percent). Through their research, TRB found broad support for CMAQ and the continuation of the program. They also found it was not possible to undertake a credible scientific national-level study that evaluated program cost-effectiveness. The report offers many recommendations from TRB for future implementation within the CMAQ program; it reiterated the value of the CMAQ program, stressing the importance of reauthorization with certain modifications.

Outcomes

The report made several recommendations for the continued success of the CMAQ program, including:

1. maintain primary focus on air quality through a variety of congestion programs;
2. involve state and local air quality agencies more directly in evaluation of proposals for CMAQ funding;
3. broaden project eligibility and funding to include all pollutants regulated under the 1990 CAAA;

4. any local projects demonstrating potential to reduce transportation-related emissions should be eligible;
5. relax restriction on the use of CMAQ dollars for operations;
6. consider use of CMAQ dollars for land use strategies that have air quality benefit;
7. develop more rigorous local procedures for selection and evaluation of CMAQ projects in the context of local air quality and congestion problems;
8. provide incentives and guidance to local recipients of CMAQ funds to encourage more evaluations of funded projects; and
9. undertake national-level targeted program evaluation.

4.2 Collaboration Improves Project Mix in the Transportation Improvement Plan



Dan Rocha
NCTCOG

www.nctcog.org

Background

The TIP for the Dallas/Fort Worth metropolitan area consists of a multi-year listing of surface transportation projects. Proposed funding for each project comes from local, state and federal resources. The TIP, which is developed through a cooperative effort between NCTCOG's Regional Transportation Council (RTC) and the Texas Department of Transportation (TxDOT), also includes substantial, collaborative input from local governments and transportation authorities in the region.

The TIP objectives are to:

1. identify and delineate transportation improvement projects recommended by TxDOT and the RTC;
2. indicate realistic, current estimates of costs for funding TIPs; and
3. demonstrate that energy, environment, air quality, cost and mobility considerations are addressed in regional transportation planning and programming.

Within these objectives, projects are selected for inclusion in NCTCOG's TIP based on a *Call for Projects* issued to local governments as funding becomes available. Funding sources for these projects originate from the Surface Transportation Program/Metropolitan Mobility Program, CMAQ Improvement program, Urbanized Area Formula programs, Elderly and Persons with Disabilities programs, and the Urban Street Program.

Overview

The *Call for Projects* selection process used consistent criteria to rank both congestion mitigation and surface transportation projects to ensure environmental benefits. The criteria used to assess the projects included cost effectiveness, air quality and energy conservation, local cost participation share, and intermodal, multmodal and social mobility concerns. Cost-effectiveness was calculated according to two methods. Capacity and system improvement projects were evaluated using a travel time savings methodology while other projects were evaluated based on the vehicle hours of delay removed from traffic stream. Air quality impacts were analyzed based on the change in emissions resulting from the project.

Since 1992, NCTCOG had three major and several smaller *Call for Projects*. This process covered a variety of programs including mobility and air quality, urban street rehabilitation, alternative fuels and clean vehicles, and land use and transportation joint ventures.

Outcomes

While funds for projects listed in the TIP are committed over a multi-year period, project listings are constrained financially to available funding resources, making the project evaluation criteria and selection process extremely important.

4.3 A Broad Mix of Innovative Projects Can Impact Air Quality

Diane Nguyen
SJCOG
www.sjco.org



Background

Many COGs and MPOs strive to allocate their limited financial resources across diverse transportation and air quality projects. SJCOG addressed the problem of decreased air quality by expanding CMAQ competition to include 15 school districts, as federal guidelines assert that school districts are eligible for CMAQ funding, making school buses equally eligible for fleet conversions as street sweepers, garbage haulers, and light and medium-duty vehicles. CMAQ funding for buses allowed them to be utilized beyond their 20 year life span. When school buses were incorporated into the mix of projects, they were among the highest polluters based on age and VMT.

Overview

SJCOG determined that school districts, as public agencies, were qualified for CMAQ funds based on CMAQ alternative fuel guidelines. This led SJCOG to adopt policies for alternative fuel vehicles that do not serve a public transit purpose. This also required a fair distribution of funds so that traditional CMAQ recipients would not lose financial support due to the inclusion of school districts.

As the cost of the bus projects were more than double the available CMAQ funds, SJCOG conducted a survey of the respective school districts to estimate their likelihood to compete for CMAQ funds. A majority indicated a lack of interest to compete based on their small fleet sizes and the financial disincentive of the 20 percent local match provision.

SJCOG opened competition for a three-year allotment of CMAQ funds to 15 local school districts in addition to traditional stakeholders such as public works departments, local and regional transit bus agencies, the commuter rail authority, and the air district. To maintain stakeholder consensus, the following policies were adopted towards heavy-duty, non-transit fleets.

1. Initial conversions were defined as 16 percent of a fleet or five vehicles, whichever is more.
2. Initial conversions were funded at 50 percent per school bus vehicle with subsequent replacements limited to a maximum of 25 percent.
3. Each CMAQ cycle would fund up to 18 percent of available funds or \$3 million, whichever is more in order to cap funding use by another party in California.

Outcomes

Because opening the CMAQ funds to bus fleets was a new strategy, SJCOG had to build consensus among stakeholders. As a result of SJCOG's policies, CMAQ funds were allocated toward a mix of projects including traffic signal coordination, transit bus vehicles, light-duty vehicle fleet conversions, compressed natural gas stations and school buses to address serious air quality concerns.

4.4 Transportation-Based Performance Measures are Integral to Program Evaluation



Background

Performance measures serve as an integral part in the process of evaluating CMAQ programs. They aid planners in identifying, prioritizing and evaluating comprehensive strategies that integrate transportation and air quality.

Performance measures use a systematic process that begins with a vision defined by goals and objectives. They are used to demonstrate whether specific projects and/or programs are achieving stated goals, requiring data from relevant indicators such as transportation systems, urban activities, policies and environmental impacts to assess a project's success.

Jim Wild

EWCOG

www.ewgateway.org

Overview

When considering NAAQS, emissions reductions and air quality improvements, EWCOG recommends the following six transportation-based performance measures:

1. *Accessibility*: average travel time, percentage of a region's mobility-impaired population reaching activities by public transportation, and proximity to employment sites;
2. *Mobility*: percent hours traveled, percent walking or bicycling, percent on-time transit performance and lost productivity due to congestion;
3. *Economic Development*: the economic cost of crashes, jobs created or supported, and the percentage of the region's unemployed or low-income who identify transportation access as a major barrier to employment;
4. *Quality of Life*: customer perceptions of urban quality of life, average number of hours spent traveling, amount of pollution generated, and lost time due to congestion;
5. *Environmental and Resource Consumption*: sprawl, number of accidents involving hazardous wastes, fuel consumption per VMT and number of days in air quality noncompliance; and
6. *Safety*: number of crashes per VMT per year and per trip, response time to accidents, crash risk index, customer perception of safety and the percent of roadway pavement rated "good" or "better".

Outcomes

Influences on performance cannot necessarily be collected in the form of objective data. Moreover, not all data is needed or useful for performance measures. Intelligent Transportation Systems (ITS) have enhanced the systematic approach to transportation-based performance measures and the coordination of transportation and air quality planning.

4.5 Comprehensive Planning: A Way to Encourage Commitment and Input in the TIP Project Selection Process



ATLANTA REGIONAL COMMISSION

Jane Hayse

ARC

www.atlantaregional.com

Background

ARC fosters relationships between federal agencies, Georgia DOT, Georgia Regional Transportation Authority (GRTA), local agencies and the public.

ARC has a 39-member Board, a 21-member Transportation and Air Quality Committee, a 15-member Transportation Coordinating Committee and various subcommittees. This structure facilitates open communication and collaboration.

Overview

The ARC TIP Subcommittee conducts its project selection process in three steps:

1. The Subcommittee holds a workshop that teaches sponsors and staff about documentation and project submission.
2. Two months later the Subcommittee holds a call for projects during which request forms are submitted electronically and sponsors are made aware of available funds.
3. Finally, the Subcommittee objectively ranks projects based on evaluation criteria and then prioritizes funds across the selected projects until all funds are programmed.

Evaluation criteria include accessibility and mobility measures, air quality measures, system performance and preservation measures, and quality of life measures.

1. Accessibility and mobility monitors average speed per type of vehicle, average travel time in minutes and home-based, transit work trips.
2. Air quality assesses NOx and VOC levels.
3. System performance and preservation examines per capita VMT and vehicle hours of travel (VHT).
4. Quality of life takes into account travel in congested conditions, proximity of investments to environmental justice groups, and impacts on wetlands and historic areas.

Outcomes

Since current criteria are limited by subjectivity and lack of applicability to all projects, ARC has proposed new evaluation criteria. These criteria would assign points based on quantifiable measures of need or impact, provide unique scoring for each project type, and be more explicitly tied to the defined goals and objectives of the TIP.

4.6 Incorporating Environmental Justice to Improve Air Quality and Transportation

Daniel Gardner
NIRPC
www.nirpc.org



Background

NIRPC is the designated MPO for the northwestern Indiana region, comprised Lake, Porter and La Porte counties. It has a population of 741,468 and includes 44 townships, and 41 cities and towns. NIRPC has developed partnerships with environmental groups, key policy individuals and the private sector.

Overview

In order to broaden citizen participation in the regional planning process, NIRPC contracted with a local environmental justice organization and undertook the following steps:

- expanded low-income and minority population involvement in the transportation planning/decision-making process;
- identified the expanded activities and policies in a revision to the NIRPC Public Involvement Plan;
- enhanced the identification of low-income and minority populations and the distribution of information relating to transportation planning activities impacting these populations;
- assessed whether there would be disproportionately high and adverse impacts of plans and programs on low-income and minority populations; and
- incorporated the Environmental Justice Strategy recommendations into the transportation planning process through the Unified Planning Work Program.

This strategy was formally adopted as part of the 2000 amendment to *Vision 2020* - the Northwest Indiana RTP. NIRPC also created the Public Involvement Advisory Committee (PIAC) to oversee the NIRPC transportation and associated air quality public involvement activities. PIAC focused on specific outreach activities and was responsible for recommending any revisions to the TIP that reflected environmental justice provisions.

Outcomes

NIRPC more actively pursued outreach in the areas of social justice, sprawl and transit to strengthen the environmental justice components of their transportation and air quality planning processes. The Environmental Justice Strategy and PIAC were both developed as ways to ensure that any disproportionate impacts of transportation and air quality plans are taken into account.

4.7 Look Toward Committees to Effectively Rank, Evaluate and Monitor Projects



Background

CATS is responsible for selecting and monitoring CMAQ eligible projects in northeastern Illinois, while the Illinois DOT is responsible for administering approximately \$60 million in federal funding. CATS is governed by a Policy Committee, consisting of 20 representatives of local governments and transportation and planning agencies.

Patricia Berry
CATS
www.catsmpo.gov

Overview

Potential transportation projects are ranked and selected through a systematic process. First, CATS staff analyzes information obtained by reviewing applications and MOBILE5, which assesses VOC reductions based on speed and year. Following this analysis, CATS estimates the effects that traffic flow improvements and sign interconnects have on speeding and the trips eliminated or diverted due to bicycles, pedestrians and transit improvements.

Next, a CATS Selection Committee chooses among ranked transportation projects. The projects are ranked based on primary criteria including cost per ton of VOC removed and reduction in NO_x, and on secondary criteria including VMT reductions and trips eliminated. The recommendations go through a period of public comment before being adopted by CATS Work Program Committee and the Policy Committee. FHWA makes the eligibility determination after this adoption process.

Outcomes

Projects undergo a monitoring stage after implementation in which they are reevaluated when cost increases are requested. If the new project ranking falls below other projects not approved that year, the cost increase is not approved. Projects not making satisfactory progress are identified and new timelines are set. Often, newly available funds coming from monies held in reserve or withdrawn projects are put toward small-scale increases.

Workshop Five, March 23, 2003: Proposed 8-Hour Ozone Standards and Health Effects of PM_{2.5}

NARC held the fifth in a series of workshops addressing integrating air quality and transportation planning in Washington, DC, on March 23, 2003. This workshop focused on the regulation and implementation options for the new NAAQS. The reauthorization of the transportation bill, TEA-21, was also reviewed from a federal and state perspective.

The questions addressed include:

- What are the proposed 8-hour ozone standards and how will they impact newly designated nonattainment areas?
- How will the reauthorization of TEA-21 affect the greater number of designated nonattainment areas anticipated under the 8-Hour Ozone Standard?
- What is an Early Action Compact (EAC) and how can it help localities address the new 8-hour standard?
- What are the physiological health effects of particulate matter?

Workshop five presented regulation and implementation options for the newly proposed 8-hour NAAQS. It outlined strategies that newly designated nonattainment areas may utilize, including the EAC option. It also reviewed the problem of ozone transport and the negative health effects of PM_{2.5}.

Workshop Topics and Presenters

- 5.1 Revised Standards: A Discussion on Proposed Ozone and Particulate Matter NAAQS
John Silvasi, EPA, highlighted the new ozone guidelines, associated legal challenges, revisions to the EPA implementation plan, and the transition between the 1-hour and 8-hour standards.
- 5.2 The Federal Perspective: TEA-21 and Its Effects on Air Quality Planning
Michael Savonis, FHWA, provided participants with the federal perspective on TEA-21 reauthorization and its impact on the funding of the CMAQ program.
- 5.3 A State's Perspective on the New 8-Hour Ozone Standards
Sheila Holman, North Carolina Department of Environment and Natural Resources (NCDENR), examined how North Carolina plans to respond to air quality conformity issues in its newly designated 8-hour ozone nonattainment areas.
- 5.4 The Importance of Data Inventory, Modeling and Verification to Early Action Compacts
Viplav Putta, Indian Nations Council of Governments (INCOG), gave an overview of its EAC, designed to help localities achieve the 8-hour standard.
- 5.5 Cooperation Creates Better Policies for Tackling Ozone Transport
Sandeep Dey, West Michigan Shoreline Regional Development Commission (WMSRDC), highlighted how WMSRDC created a coalition of partners to tackle the problems of ozone transport.
- 5.6 Overview of the Physiological Health Effects Resulting From Particulate Matter
George D. Thurston, Sc.D., New York University School of Medicine, examined the physiological side effects of particulate matter on human health, sharing a variety of scientific studies and web resources with workshop participants.



John Silvasi
EPA

www.epa.gov

5.1 Revised Standards: A Discussion on Proposed Ozone and Particulate Matter NAAQS

Background

The changes in President George W. Bush's Administration's proposal for transportation reauthorization and the EPA-revised NAAQS will impact newly designated nonattainment areas.

Overview

The revised ozone standard will be monitored over an 8-hour period at 0.08 ppm. To attain this standard, the three-year average of the fourth highest daily maximum 8-hour average of continuous ambient air monitoring data over each year must not exceed 0.08 ppm. When implemented, the new particulate matter NAAQS will account for finer particles that generally are produced by fuel exhaust and industrial fuel combustion.

After a number of legal challenges, the U.S. Supreme Court upheld the NAAQS. However, it maintained that the EPA had to revise a more flexible Subpart 1 and a more prescriptive Subpart 2 of the federal CAA. As such, EPA's revisions to Subpart 1 take into consideration the following objectives:

- incentives for expeditious attainment of and transition to the 8-hour standard;
- reasonable attainment deadlines;
- consistency with the CAA and Supreme Court;
- state flexibility;
- emphasis on national and regional measures; and
- decreased use of more expensive controls.

With these considerations, a new schedule was proposed regarding the implementation rule and designation of attainment status:

In reconciling Subpart 1 and 2 of the CAA, EPA devised two options to consider:

1. classify all 122 hypothetical 8-hour ozone designations under Subpart 2 of CAA; or,
2. divide all 8-hour nonattainment areas into two groups based on their 1-hour ozone design value. Those 8-hour nonattainment areas achieving the 1-hour ozone standard will be regulated under the more flexible Subpart 1 regulations, while nonattainment areas will be regulated under the stricter Subpart 2 regulations.

Regarding the transition from the 1-hour ozone standard to the 8-hour standard, two options were proposed:

1. revoke the 1-hour ozone standard one year after the EPA officially designates the 8-hour ozone standard; or,
2. retain the 1-hour ozone standard for those areas that would benefit from the 8-hour ozone standard.

Conformity would only apply for one standard under both options

Outcomes

Reconciliation of Subpart 1 and 2 of the CAA was a critical issue to be addressed based on the Supreme Court's ruling on EPA's implementation plan. The reconciliation structure would affect options for designating nonattainment areas, anti-backsliding, reasonable further progress, and new source review.

5.2 The Federal Perspective: TEA-21 and its Effects on Air Quality Planning



U.S. Department of Transportation
Federal Highway Administration

Michael Savonis
FHWA
www.fhwa.dot.gov

Background

The reauthorization of TEA-21 is expected to impact air quality planning, especially in nonattainment areas participating in the CMAQ program. Unlike the Intermodal Surface Transportation Efficiency Act of 1990 (ISTEA) and TEA-21, there will be no significant increase in funding with this reauthorization.

Overview

The lack of increased funding creates a challenge due to the expected increase in nonattainment areas in need of federal funding to reach conformity. The limited nature of the current CMAQ funding formula is a concern for FHWA and many MPOs and COGs. It does not account for particulate matter of any size or provide for the inclusion of the 8-hour ozone or PM2.5 standards.

Outcomes

While new ozone and particulate matter nonattainment areas are eligible for CMAQ funds, failure to change the formula will limit the federal assistance available to COGs and MPOs. Without an update, the CMAQ formula reverts to the carbon monoxide standard which limits the distribution of CMAQ funding, because fewer states are contributing to the formula. This results in a greater percentage of states receiving minimum apportionment regardless of their ozone or particulate matter attainment status.

This presentation asserted that potential to expand CMAQ funding to operations in traffic and incident management should also be addressed. For example, only 37 percent of transit costs are covered by commuter fares, leaving nearly \$14 billion in costs to be covered by other sources.

5.3 A State's Perspective on the new 8-Hour Ozone Standards



Background

With the new NAAQS, North Carolina will readdress its nonattainment boundaries as it is projected to be the second most impacted state, looking to EPA for guidance on area designation and conformity issues.

Sheila Holman
NCDENR
www.enr.state.nc.us

Overview

The EPA states that any area with a violating ozone monitor and nearby contributing areas should be designated as nonattainment. It recommends that a full metropolitan statistical area (MSA) serve as an 8-hour ozone boundary. Thus, when adjusting for violating areas within the state that are a different size from the MSA, planners have to adjust for population densities, monitoring data, location of emission sources, traffic and commuting patterns, expected growth, meteorology, and jurisdictional boundaries.

North Carolina has taken several actions to reduce ozone-forming emissions from cars and trucks, power plants and other industries, including:

- enacting legislation that will require cleaner gasoline statewide by 2004 and expand the motor vehicle emissions testing program to nearly half the state by 2006, regardless of a region's attainment status; and
- developing new rules to require substantial reductions in NOx emissions from power plants and other large industrial sources.

Outcomes

When determining nonattainment boundaries under the new 8-hour regulation, North Carolina will confront many challenges, including:

- evaluating violations, conducting public meetings and coordinating with many agencies impacted by the designation;
- assisting designated nonattainment areas with new source review, SIP development and control measures; and
- helping nonattainment areas demonstrate that area transportation plans meet conformity with SIP motor vehicle emissions budgets.

When confronting newly established 8-hour nonattainment boundaries at the local level, planners should spend resources efficiently, balance the environment with economic stability, and work with informal transportation conformity processes in rural areas.

5.4 The Importance of Data Inventory, Modeling and Verification to Early Action Compacts



Viplav Putta
INCOG

www.incog.org

Background

EACs require planning in order to meet attainment of the 8-hour standard by the end of 2005. In return, the EAC region receives a deferred designation as a nonattainment area. To be eligible for an EAC, a region must be in attainment for the 1-hour standard. INCOG used an EAC to reduce ozone and expedite achievement of the 8-hour standard before the implementation of EPA's 8-hour NAAQS.

Overview

Two major components were required for INCOG's EAC were:

- an MOA for the development and implementation of a technical plan; and
- a local stakeholder process to help define local area air shed modeling and appropriate control strategies.

These actions include a number of selected control measures that were used to model the region's achievement of the 8-hour standard by December 2007. This would be enforceable through the SIP no later than December 2004. As such, an 8-hour nonattainment designation could be deferred, as long as the terms defined in the EAC MOA are met.

Outcomes

Verifying the necessary data for the EAC can be time and labor intensive, requiring data on seasonal ozone episodes, as well as area and point sources. Modeling requirements such as MOBILE6 travel demand models and non-road models adjusted for local equipment and usage rates are also necessary. Consequently, planners should create flexible timelines to address these and other technical requirements associated with the EAC.

5.5 Cooperation Creates Better Policies for Tackling Ozone Transport



Sandeep Dey
WMSRDC

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Background

West Michigan consists of a metropolitan population of approximately 1.1 million people. Three MPOs – the West Michigan Shoreline Regional Development Commission (WMSRDC), the Macatawa Area Coordinating Council (the MACC) and the Grand Valley Metropolitan Council (GVMC) – encompass this region, which is expected to receive a nonattainment designation under the 8-hour ozone standard.

Overview

In some parts of West Michigan, over 95 percent of ozone pollutants come from larger metropolitan areas to the west and south. Lake Michigan also has a chemical effect on ozone, exacerbating the pollution problem in shoreline counties. The ozone transport issue is dominant in Muskegon County, a small metropolitan area in nonattainment and in need of action to address ozone transport and regional and interstate cooperation.

To address these challenges, the West Michigan Clean Air Coalition was formed. The Coalition is a partnership between business and industry, the academic community, public interest groups, health departments, the three MPOs, the Michigan DOT and the Michigan DEQ. The coalition is comprised of several committees, which assist in the development of policy and finances, serve as a liaison with federal, state and local agencies, and develop educational and media materials.

Outcomes

Based on a survey taken over an eight-year period, the Coalition's efforts resulted in an increase of the public's understanding of ozone action days. In addition to educating the public and business community on air quality issues, the Coalition has also addressed overcoming the economic disadvantages of being designated as a nonattainment region.

5.6 An Overview of the Physiological Health Effects Resulting From Particulate Matter



George D. Thurston
New York University School of Medicine
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Background

Recent epidemiological and toxicological studies have indicated that particulate matter air pollution can cause significant adverse health effects. Documented effects of ambient air pollution range from reduced lung function in children and adults, lung airway inflammation, asthma exacerbations, increased hospital emergency room visits and admissions, and higher mortality incidence.

Overview

Particulate matter air pollution is composed of two types of particles. Primary particles are emitted directly from air pollution sources, while secondary particles are formed in the atmosphere from gaseous pollutants such as sulfur dioxide. Those most affected by particulate matter include older adults, people with preexisting respiratory disease, children, healthy adults who exercise outdoors and people with inadequate health care.

Over time, combustion/industrial particles may be more toxic. Humans are now exposed to industrial and fossil fuel combustion particles that the lung has not yet evolved defenses against. These particles have different sizes and physiochemical characteristics from more natural particles such as wind blown soil. Since the lung has not evolved defenses to keep particles out of the deeper, alveolar region of the lung, this suggests a cause for concern.

Cross-sectional studies conducted by Thurston and Ozkaynak (1987), Dockery et al (1993), and Pope et al (1995) suggest that sulfate-associated fine particles (i.e. fossil fuel combustion products) are among the most toxic. A 2002 Journal of the American Medical Association (JAMA) article extended a follow-up analysis of American Cancer Society data, confirming the original associations of sulfates and PM_{2.5} with human cardiovascular mortality, including associated cancer deaths. Another study showed increased acute mortality at higher daily PM pollution concentrations (Schwartz 1997).

Outcomes

The body's natural defense mechanisms are not strong enough to combat the more insoluble, smaller particles that make their way deeper into the respiratory system. While PM₁₀ poses a problem for the upper, nasopharyngeal portion of the respiratory system, PM_{2.5} affects the lower, tracheobronchial and pulmonary sections. Even with a limited number of nationwide continuous particulate matter monitors, there is enough supporting scientific evidence showing that long-term exposure to fine particles has severe health impacts.

This research can be found in JAMA, March 6, 2002 - Vol 287, No 9 at www.jama.com. Entitled: "Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution."

Workshop Six, June 22, 2003: Data Needed for Air Quality and Transportation Models

NARC held the sixth in a series of workshops addressing integrating air quality and transportation planning in Pittsburgh, Pennsylvania, on June 22, 2003. This workshop provided COGs and MPOs with useful tools and applications for data collection and modeling. In order to reach conformity, both are necessary components of a successful transportation and air quality planning program.

The questions addressed include:

- What are some of the current modeling practices used by COGs and MPOs?
- How do large and small MPOs differ in air quality and transportation modeling approaches and needs?
- What are some of the changes in MOBILE6 from the previous modeling software?
- Can MPOs and COGs use alternative data collection and modeling methods?

Workshop six outlined the importance of data collection and modeling practices in reaching conformity. It presented the difficulties small and medium size MPOs may come across due to lack of technical and financial resources. It also emphasized the importance of early planning, detailed time lines, and alternative data collection as ways to anticipate and manage air quality planning setbacks.

Workshop Topics and Presenters

- 6.1 The Challenges of Modeling: Results of a National Study on Modeling
Dr. Thomas Walker, DVRPC, presented the results of a national study by NARC and DVRPC on the state of the practice in MPO and COG modeling strategies.
- 6.2 Modeling Complexities Challenging Small and Medium-Sized MPOs
Daniel Szekeres, Michael Baker, Jr., Inc., focused on the complexities of regional SIP and conformity modeling done by small and medium sized MPOs, emphasizing available data sources and software tools for developing a robust and defensible emissions calculation process.
- 6.3 Overview of the U.S. Environmental Protection Agency's Modeling Software, MOBILE6
Janet Kremer, EPA, provided workshop participants with an overview of EPA's latest emissions modeling software, MOBILE6.
- 6.4 Working Together: The Importance of Understanding Science and Policy When Planning for Ozone
Michael Koerber, Lake Michigan Air Directors Consortium (LADCO), focused on the science of ozone formation and presented an in-depth discussion on how science and policy can affect ozone planning.
- 6.5 Early Planning Can Affect Ozone Action
Bill Davis, Northeast Ohio Areawide Coordinating Agency (NOACA), examined how early, coordinated planning can successfully impact conformity documentation, particularly when stakeholders are involved in the process.
- 6.6 Using Alternative Data Collection and Modeling Methods to Aid Conformity
Chuck Imbrogno, Southwestern Pennsylvania Commission (SPC), examined how SPC used alternative data collection and modeling methods to make conformity findings for three counties in its planning area.

- 6.7 Planning for Setbacks in Conformity Documentations Can Offset Resource Constraints
Robert Dickinson, South East Texas Regional Planning Commission (SETRPC), looked at the advantages of preparing detailed time lines in order to offset resource constraints when planning for conformity.
- 6.8 The “Journey-Based” Travel Model Developed by NYMTC: An Overview
Sangeeta Bhomick, New York Metropolitan Transportation Council (NYMTC), shared reasons for developing the “journey-based” travel model and how this type of modeling is different from traditional methods.

6.1 The Challenges of Modeling: Results of a National Study on Modeling



Delaware Valley Regional Planning Commission

Dr. Thomas Walker
DVRPC

www.dvrpc.org

Background

NARC and DVRPC collected data on current modeling practices, planned upgrades, and the related costs for model enhancement, maintenance and validation used by MPOs. Using the size of the region as the unit of analysis, the survey responses were analyzed for forecasting responsibility, model type, validation frequency, input data, output use and planned upgrade timeline and expenditure. All of the MPOs that responded are the lead agencies for transportation forecasting within their regions.

Overview

A regions size can impact whether or not an MPO is required to do mobile source emissions modeling. Nearly all of the large MPOs estimated their vehicular emissions, either directly or through outside agencies. About one-third of the small MPOs (with a population under 500,000) in the sample estimate vehicular emissions; 75 percent of these MPOs are currently in attainment under the 1-hour ozone standard and are thus not required to demonstrate conformity.

Under the proposed 8-hour standard, MPO size would dictate requirements for interagency coordination, consultant services, and resource allocation for transportation air quality modeling. The large MPOs with conformity reclassifications under the 8-hour standard already have transportation and air quality modeling resources to draw on for emissions calculations.

The results of the survey showed that the largest MPOs planned to spend upwards of one million dollars per year on land use, transportation and air quality model validation and upgrades. Conformity is a major use for the models in nonattainment regions, although traditional uses for travel demand models are still prevalent. These include Major Investment Studies (MIS), Environmental Impact Studies (EIS), evaluation of long-range transportation plans, congestion management, land use scenario testing, environmental justice, and ITS planning.

Outcomes

Smaller MPOs must tackle a number of modeling challenges, such as little or no modeling expertise, smaller budgets, and limited staff and technical resources available for modeling work. For the technical aspects of the conformity determination they must rely either on the state DOT, environmental agencies, and/or consultants. The study also gave specific legislative recommendations, which were incorporated into NARC’s Priorities and Proposals for the Reauthorization of the Transportation Equity Act for the 21st Century (TEA-21) - Transforming the Landscape of Regional Travel.

This document identifies six policy guidelines:

- The bill should provide funding for model maintenance and upgrade.

- MPOs should be given modeling flexibility to tailor their models to local issues and needs.
- Detailed model specification issues should not be addressed in the legislation, but rather, an updated best practices manual is needed.
- New transportation initiatives should include funding for required model upgrades.
- Required model validations should be coordinated with Census data availability.
- The bill must provide for MPOs who are in nonattainment because of the 8-hour standard.

6.2 Modeling Complexities Challenging Small and Medium-Sized MPOs



Daniel Szekeres

Michael Baker, Jr., Inc.

Background

Many small to medium-sized MPOs lack the staff, money and modeling expertise www.mbakercorp.com to perform air quality estimates. Dealing with modeling deficiencies and potential air quality linkages has often lead MPOs to work with the U.S. DOT, their state DOT, state environmental agencies, consultants and other stakeholders to address air quality issues. In Pennsylvania, a consultant under state contract provided various levels of support ranging from giving technical guidance to performing all work phases of the conformity process.

Overview

The flow of data and tools typical of a mobile emission calculation process consists of a combination of traffic and air quality input data as well as software tools including: travel demand modeling software, post processing algorithms and the EPA latest MOBILE6 emission model.

The major input data items to the emission calculation process include: VMT by facility class; regional congested speeds by time-of-day; estimates of regional trip starts; region-specific vehicle type mixes and fleet ages; regional control measures; fuel and environmental data; and the region-specific emission factors.

The MOBILE6 software provides “gram per mile” emission factors based on data provided to the model. The figure below illustrates the typical data requirements for MOBILE6 and highlights the data provided as input for small urban and rural areas within Pennsylvania. MPOs may be expected to prepare estimates of VMT, speeds, vehicle mixes (number of trucks) and the number of trip starts.

Sketch planning techniques and software can also serve as valuable tools to determine the potential impact of highway, transit, demand management and other transportation control measure projects.

Congested speeds impact the emission factors produced by the MOBILE6 software, which allows input of congested speeds by time-of-day. However, output for congested speeds is usually not provided by time-of-day and is often sacrificed altogether for production of more accurate traffic volumes. Non-model traffic data sources do not contain congested speed estimates. Such values must be calculated for individual roadway segments based on the available descriptive information and traffic volumes. Post processing methodologies or software often play a key role in the calculation and preparation of congested speeds for input to MOBILE6.

Outcomes

As smaller regions come into nonattainment under the new 8-hour ozone standard, the need for conformity planning assistance will only increase. While staffing and resource constraints result in a greater need for conformity planning assistance, there are resources available that can help lend modeling expertise, improve data collection, form interagency relationships, and streamline the planning process.

6.3 An Overview of the EPA's Modeling Software, MOBILE6



Janet Kremer
U.S. EPA
www.epa.gov

Background

On January 29, 2003, EPA released MOBILE6, the newest iteration of their emissions modeling software. Use of the model is required for regions in serious, severe or extreme nonattainment of ozone standards. All other regions will be required to use the model for State Implementation Plan/Conformity planning as of January 29, 2004.

Overview

'MOBILE' is a software series developed and distributed by EPA that calculates emissions factors in grams per VMT for on-road mobile sources, accounts for vehicle fleet characteristics, traffic activity, environmental variables, some control measures, and fuels. Emission factors must be multiplied by VMT to obtain emission totals.

MOBILE6 includes new or enhanced features such as: weather inputs, hourly temperatures, increased traffic activity data, speed distributions instead of averages, greater vehicle types, hot soak distributions, separate trip starts, facility pattern data, and distribution of traffic per hour of day. These changes allow for greater accuracy, greater input flexibility, incorporation of new vehicles, fuels, emissions control technologies and database file output.

Input Data to MOBILE6

Required Local Data	Recommended Local Data	Optional Local Data	Recommended Default Data
Regional Temperatures	Registration (vehicle age) data	Diesel Sales Fractions	Other Air-Conditioning related inputs
I/M Assumptions	Absolute Humidity	Vehicle Trip Length Durations	Annual Mileage Accumulation Rates
Special Fuel Characteristics (RFG, RVP)	VMT Fractions by vehicle class	Hourly VMT Pattern Data	Vehicle Engine Starts Per Day
Calendar Year of Evaluation	VMT by Facility Class		Vehicle Soak Times (3 types)
Altitude	VMT Fraction by Speed	Status May Change in Future	

Figure 9. Input Data for MOBILE6

The MOBILE6 VOC and NOx curves are also less sensitive than in MOBILE5 which impacts future project emissions estimates and becomes more significant for NOx beyond the year 2020.

Outcomes

Software changes increase the complexity of data needed and the expertise required to run the model. This can be especially problematic in small or midsize regions with staffing and resource constraints.

6.4 Working Together: The Importance of Understanding Science and Policy When Planning for Ozone



Background

In 1989, four states -- Illinois, Indiana, Michigan, and Wisconsin -- partnered with the EPA to address significant ozone problems in the Lake Michigan area. These four states and the EPA signed an MOA, establishing the Lake Michigan Ozone Study (LMOS) and forming LADCO to oversee the study. LADCO currently provides technical assessments and assistance to its member states on regional air quality problems, including ozone, particulate matter, regional haze and air toxics.

Michael Koerber
LADCO
www.ladco.org

Overview

Motivating science and policy groups to work together for ozone planning can be challenging. Coordination requires that science groups be objective, relevant, timely and comprehensible, and policy-makers to be committed, patient and willing to learn about technical issues. Successful airshed planning requires the coordination of these groups along with regulatory approaches that are incremental, flexible, allow feedback of information, and recognize resource limitations and regional differences.

LADCO has achieved several successes balancing sound science and policy, including:

- improved air quality, with few monitoring sites still in violation of the 1-hour ozone standard;
- a successful network that combines resources, shares data, collaborates on technical activities, and fosters cooperation; and
- the development of the expertise needed to collect and analyze air quality data, create multi-state emissions inventories, and run regional air quality models.

Outcomes

The process by which ozone is formed is strongly influenced by weather, meaning concentrations of ozone precursors are highest in the summer and hotter summers produce more ozone. The amount of heat, sunlight, and wind influence ozone formation and transport.

The technical nature of ozone formation and transport results in several unique issues for ozone planning:

- It creates a tension between the science and the policy aspects of conformity. Within this context, there is a need to balance regulatory requirements, budget limitations, and schedule constraints within the context of policy and science.
- There can be conflicts between “real-world” air quality management and attainment of legal standards.
- The ozone control path must be correctly identified (i.e. impact of VOC, NO_x or a combination).
- The role of transport significantly contributes to the presence of ozone.
- Other regional pollutants must also be considered (e.g. PM_{2.5} and haze).

6.5 Early Planning Can Affect Ozone Action

Bill Davis
NOACA
www.noaca.org



Background

NOACA is the MPO for the counties of Cuyahoga, Geauga, Lake, Lorain and Medina in Ohio. The organization works with a variety of agencies, including the Akron Metropolitan Area Transportation Study (AMATS), in documenting conformity for an eight county nonattainment area.

Overview

Responsibility for the preparation of the SIP and conformity documents vary by region. NOACA prepares the paperwork for both for the eight-county nonattainment region in Ohio, ensuring that the modeling assumptions and procedures are the same for the two documents. In other areas, different agencies can tackle SIP and conformity issues. With a large number of stakeholders involved in the conformity process, early communication about modeling assumptions and methods can ensure that the document is accurate and deadlines are met.

One example of NOACA's need for early, coordinated planning can be seen in the Build/No Build criterion, meant to prevent the start of any proposed transportation project adversely affecting air quality. In practice, it presents significant modeling challenges. A project can pass or fail the criterion by a fraction of a ton, which is often less than the margin of error in the modeling program itself.

If the project exceeds the emissions budget, NOACA considers four options:

1. **Off-model credits**, which require assessing projects not accounted for in the travel model, and involve off-model estimation of traffic counts, VMT, and speeds.
2. **Safety margins**, which can be built into a SIP during its preparation and can be reallocated later to a source sector exceeding the emissions budget.
3. **New measures**, which might include I/M programs, new fuel formulations, changed speed limits or similar measures to decrease emissions.
4. **Keeping the status quo**, which involves renewing the existing approved TIP or SIP without changes, which allows previously programmed projects to proceed.

In order to achieve emissions with one or more of the first three options, NOACA found that early planning and coordination among stakeholders is critical.

Outcomes

In regions where different agencies are responsible for emissions modeling, lack of coordination may lead to inconsistent results and the conformity document may not be approved. As new air quality standards lead to more and smaller regions being designated nonattainment, early planning is critical in regions that are new to the conformity modeling process.

6.6 Using Alternative Data Collection and Modeling Methods to Aid Conformity

Chuck Imbrogno
SPC
www.spcregion.org



Background

Boundary issues arise when only part of a region's nonattainment area is accounted for in the network travel demand model used for air quality planning. An area may be absent from the network due to lack of data or a previous attainment designation that didn't warrant inclusion in the model. Conformity planning must then be completed with both the network model and with off-network modeling methods.

SPC is the MPO for a ten-county region in Pennsylvania. Between 1998 and 2003, the region grew from six to ten counties. Conformity assessments were required in three of the four new counties, however SPC's network travel demand model only covered the original six-county region.

Overview

Alternative techniques were used to assess conformity in the three nonattainment counties outside the network model area that required conformity assessments.

Data needed for the off-network model included:

- Roadway Inventory: The state system and federal aid system, speed limits, number of lanes, facility type/functional class, traffic volume by vehicle type, and traffic growth rate.
- Vehicle Inventory: Vehicle age by vehicle type and mileage accumulation by vehicle age and type.
- Proposed New Facilities: Facility type, speed limits, number of lanes, techniques to estimate, traffic volume (from diverted travel, induced travel, traffic growth rate) and technique to estimate impact on existing facilities by volume, speed and delay.

Outcomes

SPC turned to alternative approaches to make the required conformity findings for three of the region's counties. Interagency coordination was critical in developing the off-network modeling procedures and assembling the roadway vehicle inventory data.

In order to collect this data and generate off-network results SPC consulted the US Census Bureau, FHWA - Highway Statistics, FHWA - HPM, the Highway Capacity Manual, the EPA Conformity Website (<http://www.epa.gov/otaq/stateresources/transconf/index.htm>), and the FHWA Conformity Website: (<http://www.fhwa.dot.gov/environment/conform.htm>).

6.7 Planning for Setbacks in Conformity Documentations Can Offset Resource Constraints

Robert Dickinson
SETRPC
www.setrpc.org



Background

SETRPC is the MPO for a three-county region with a population of less than 200,000 people. Due to their small staff, SETRPC must plan ahead during the conformity documentation process in order to make any necessary changes prior to the deadline.

Overview

SETRPC's small size constrains its data collection and modeling capabilities, making it difficult to perform modeling for the nonattainment areas in the required three-year cycle. In order to obtain assistance from the Texas Department of Transportation (TxDOT), the SETRPC transportation staff developed a detailed timeline for data collection, modeling and documentation during the cycle. Under this timeline, all work was programmed in a manner that allowed for delays and setbacks in the timeline. As a result, SETRPC was able to work closely with the TxDOT, which runs travel demand models for 22 of the 25 MPOs in Texas. It also provides assistance in obtaining socioeconomic and highway network data.

Outcomes

SETRPC's conformity documentation process was impacted by the MPO's small staff and minimal resources for data collection. For a small MPO, developing a timeline in advance and building a margin of safety into it can greatly assist in meeting the three-year conformity deadline.

6.8 The “Journey-Based” Travel Model Developed by NYMTC: An Overview

Sangeeta Bhomick
NYMTC
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Background

NYMTC is the designated MPO for ten counties in New York, encompassing 2,440 miles, 12 million people (65 percent of New York State population), and 22,870 miles of center line roads. NYMTC’s travel demand model incorporates an enormous highway network, including single occupancy vehicle (SOV), HOV, taxi, truck and other commercial inputs, along with a vast transit network of over 100 New York City subway routes, 900 commuter rail routes, 2,300 bus routes, 50 ferry routes, and the Manhattan sidewalk network.

Overview

In response to the federal CAAA of 1990, and ISTEA of 1991, NYMTC decided to develop their own travel demand model for use in both conformity planning and the RTP. The Best Practice Model (BPM) was developed as a tool for major investment studies, congestion management and corridor and subregional analysis.

BPM differs from traditional travel demand models because “journey” is the unit of analysis. A journey is travel between two principal points, with one point always being the home. This focuses on behavior of the traveler (rather than the trip itself), automobile ownership and family interactions, and stops/stop locations. This model also examines the availability of transit and household composition. It predicts changes in future travel patterns in response to changes in demographic profiles and transportation systems in the region. BPM utilizes extensive Geographical Information System (GIS) based networks and encompasses 28 counties.

Outcomes

One of the primary challenges facing the NYMTC is data collection – primarily socioeconomic inputs including land use, population, household, employment and labor force data. Vehicle counts are obtained from NYMTC staff, as well as state, county and local agencies. Travel behavior information is obtained from roadside, household and mail surveys. All of this data is incorporated into the BPM travel demand model used for the region’s conformity planning.

Workshop Seven, February 24, 2004: Data Needed for Air Quality and Transportation Models

NARC held the seventh in a series of workshops addressing integrating air quality and transportation planning in Washington, DC, on February 24, 2004. This workshop discussed the importance of building relationships and implementing effective public outreach programs to tackle air quality problems. It also featured presentations on program and process evaluation, which facilitates identifying program areas that may need improvement, allowing a community to determine accountability, and justifying program objectives. Presenters demonstrated accomplishments and areas for improvement by using the tracking tools and resources available through FHWA's *It All Adds up to Cleaner Air* program that promotes public education and partnership-building in order to successfully address air quality issues.

The questions addressed include:

- How can public outreach improve air quality?
- How will planning organizations get out their message?
- Who are the best people to receive this message?
- Who is receiving this message?

Workshop seven stressed the importance of public outreach in the process of air quality planning. The workshop highlighted program evaluation and its use to assess the effectiveness of an outreach program and target areas that may need improvement, emphasizing the resources available in FHWA's *It All Adds up to Cleaner Air* program.

Workshop Topics and Presenters

- 7.1 Public Outreach to Improve Air Quality: A SEACO Approach
Catherine Zimmerman, Broward County Southeast Air Coalition for Outreach (SEACO), examined how SEACO came together for a public outreach program to improve air quality.
- 7.2 Public Outreach to Improve Air Quality: A NIRPC Approach
Reggie Korthals, NIRPC, looked at the variety of programs that are part of NIRPC's overall air quality improvement plan.
- 7.3 Public Outreach to Improve Air Quality: A FAMPO Approach
Mauriza Chapman, Fayetteville Metropolitan Planning Organization (FAMPO), described the various public awareness strategies FAMPO implemented in March and April 2003 to move the region toward attainment status.
- 7.4 Quantitative Evaluation of Travel and Emissions Reductions
Eric Schreffler, Electronics System-Integration Technology Conference, provided participants with an overview of the quantitative method to evaluate travel and emission reductions from "ozone action" programs.
- 7.5 Types of Evaluation Research and Their Uses for Measuring Program Performance
Kathy Daniel, FHWA, examined the four main types of evaluation research, their uses for measuring program performance, and the tools available through the *It All Adds Up to Cleaner Air* program.

7.1 Public Outreach to Improve Air Quality: A SEACO Approach



Catherine Zimmerman
SEACO
www.broward.org/air/

Background

Southeast Florida has over five million residents living in the three counties of Miami-Dade, Broward, and Palm Beach. This region has little public transit, a growing population, an increasing VMT per person, and mobile sources accounting for 50 percent of the air pollution. The three counties, with representatives from environmental and planning agencies, health departments, commuter services, some MPOs, as well as the Florida DEP, the American Lung Association (ALA), and the American Automobile Association (AAA), formed the air coalition, SEACO, to address the region's air quality issues.

Overview

SEACO's public outreach program focused on regular vehicle maintenance, with Car Care Month taking place during October. The program emphasized that regular maintenance saves the driver money, improves driver safety and respiratory health and promotes clean air. In launching Car Care Month, SEACO members agreed to share resources and establish business partners to spread the message.

Car Care Month included:

- Locating "pump topper" posters at gas stations;
- Distributing a variety of materials to the public at auto repair businesses, including car care log books, brochures that illustrate tips for cleaner air, tire pressure gauges, and other items;
- Offering free vehicle maintenance check lanes (in partnership with AAA);
- Promoting Car Care Month on public affairs radio shows;
- Advertising in trade publications;
- Airing radio public service announcements during traffic and news reports.

Outcomes

The coalition seeks more vigorous involvement with the business communities, as well as MPOs and commuter services. To help alleviate funding concerns, they plan to solicit additional financial support, as well as advertising assistance, from business interests.

The information in Figure 10 highlights SEACO's successful public outreach program using the tools available through FHWA's *It All Adds Up to Cleaner Air* program:

Clean Air Partners	2002	2003
	1 government agency	4 government agencies
	1 not-for-profit	2 not-for-profit
	11 businesses	206 businesses
Business Partners (2003)	Activity (2003)	Audience (2003)
Gasoline Stations	Distributed 1,500 print ads	41,625,000 Tri-County viewers reached
Auto Businesses	Distributed 8,000 brochures and tire gauges	8,000 Tri-County viewers reached
Radio	Broadcasted 5 radio spots	12,000 Tri-County listeners reached
Print Newspaper Ad	<i>It All Adds Up</i> message in Miami-Herald, individual county publications	370,000 Tri-County readers reached
Other	Additional efforts including vehicle check lanes	356 Tri-County drivers reached

Figure 10. SEACO's *It All Adds Up to Cleaner Air* Program Results

7.2 Public Outreach to Improve Air Quality: A NIRPC Approach

Reggie Korthals
NIRPC
www.nirpc.org



Background

NIRPC's region includes the counties of Lake, Porter, and LaPorte, with approximately 741,468 residents. The region is located along major transportation routes in and out of the Chicago metropolitan area, including the South Shore Railroad that operates one commuter route from Chicago to South Bend, Indiana. Forty-four percent of the region's air pollution is from mobile sources. All three counties have been designated moderate nonattainment under the 8-hour ozone standard as part of the Chicago metropolitan statistical area although LaPorte County is also designated as a "stand-alone" nonattainment area. In addition to addressing regulatory ozone requirements, NIRPC has discovered that voluntary outreach is important in changing people's transportation choices. With a significant number of minorities living near major truck and transit stops, NIRPC's outreach program has also played a significant role in addressing environmental justice concerns.

Overview

NIRPC's public outreach programs involve a broad array of partners, maximizing visibility and credibility, leverage resources, and influencing transportation choices. NIRPC's 2003 public outreach initiative emphasized ozone awareness and health, car care for consumers, and fuel initiatives. The following programs were implemented as part of the initiative:

- *Ozone Action Day* – This event focused on distributing promotional/informational materials at Vehicle Inspection and Maintenance Centers, educating children about ozone and disseminating general information on ozone through newspaper and radio public service announcements.
- *Car Care Program* - This ten-week program involved a partnership between local radio stations and car care centers. Live programs, referred to as "Show Me The Money" enabled listeners to stop at the car care center and provide an air quality tip heard on the air, spin a wheel for a monetary reward and receive discounts.
- *Gas Can Exchange* - This partnership between the County Solid Waste Districts and the Lake Michigan Hazardous Waste Team offered residents an opportunity to exchange old gas cans.
- *School Bus Retrofit and Bio-Diesel Conversion Program* - A partnership between the Clean Cities Coalition, schools and municipalities that undertook a fuel retrofit initiative.
- *Diesel Emissions and Truck Stop Electrification Pilot Project* – This involved the installation of 50 in-cab service modules for diesel trucks, enabling trucks to shut down their engines, rather than idle in highly populated areas along a major truck corridor.

Outcomes

NIRPC anticipates that by making use of the EPA's Demonstrating the Benefits Toolkit, they will be better able to plan, evaluate and make adjustments to program initiatives. Comparing 2002 to 2003, marked increases occurred in the request and distribution of ozone outreach materials, response and attendance at events, public interest in heavy diesel emissions and gas cans collected and distributed.

The information in Figure 11 highlights the benefits of NIRPC's public outreach program using the tools available through the *It All Adds Up to Cleaner Air* program:

Clean Air Partners	2002	2003
	4 government agencies	6 government agencies
	2 major industries	4 major industries
	6 businesses and 1 university	12 businesses and 3 universities
	1 radio station and 1 newspaper	4 radio station and 2 newspapers
Product Distribution	2002	2003
	100 teacher curricula	80 teacher curricula
	5,000 Ozone brochures	5,000 Ozone brochures
	1,000 new gas cans	2,000 new gas cans
	10,000 do not top off tank brochures	10,000 do not top off tank brochures
	10,000 ride share information cards	10,000 ride share information cards
In-Kind Contributions	<p>Much of the in-kind contributions for NIRPC's It All Adds Up public outreach program consisted of local businesses, including local newspaper ads, radio spots and giveaways, and discounted or free oil changes from local car care centers. The Solid Waste District also provided hats and t-shirts for giveaways and the Partners for Clean Air, South Shore Clean Cities and high school environmental clubs provided volunteers.</p>	

7.3 Public Outreach to Improve Air Quality: A FAMPO Approach



Mauriza Chapman

FAMPO

www.fampo.org

Background

FAMPO, serving Cumberland County, North Carolina, implemented a public outreach campaign as a result of its EAC, signed in December 2002. Like many small, rural areas, Cumberland County may confront the challenges and burdens of nonattainment status for the first time under the 8-hour ozone regulation. Public outreach is a significant part of this organization's work toward attainment.

Overview

The goal of FAMPO's public outreach strategy is to reduce NOx emissions and decrease VMT. The following are public outreach strategies undertaken by FAMPO in conjunction with its local partners:

- *Outreach through Education* - This is an ongoing effort using the GLOBE curriculum, a hands-on primary and secondary educational science program that promotes environmental stewardship.
- *Public Outreach/Events* - Staff and volunteers provide information on air quality and measures that the individual can take to help improve air quality at fairs, festivals, and community meetings.
- *Speakers Bureau* - This strategy provides the general public with tips, educational information and public meetings on implementing reduction strategies through radio, television, and print media.
- *Air Quality Web Page* - The website provides information on upcoming meetings, seasonal air quality tips, the EAC, and other relevant topics.

- *Bus Ridership For Youth* - In partnership with Fayetteville Area System of Transit (FAST), this program offers bus tours for children, educates them on the transit system and discusses the benefits of using public transit.
- *Air Quality at the Local Libraries* - Information flyers, brochures and children's programs are available at local libraries.
- *Air Quality Poster/Essay Program for Schools* - This is a promotional contest targeting public schools in 2004 and public and private schools in 2005.
- *Discourage Open Burning on Ozone Alert Days* - This program distributes outreach materials discouraging open burning and will be implemented in conjunction with the North Carolina Department of Air Quality Outreach Team.

Outcomes

FAMPO's primary challenge is to bring more public and private partners, particularly business interests, into its outreach network. Achieving this will enable FAMPO to launch more complex, wider-ranging initiatives. FAMPO has been recognized by FHWA's It All Adds Up program as a community partner.

The information in Figure 12 highlights the benefits of the first year of FAMPO's public outreach program using the tools available through the *It All Adds Up to Cleaner Air* program:

Organization/Event	Target Audience
Fayetteville Community College Health Fair	1,500
New Directions in Long-Term Care	58
Cumberland County Employee Newsletter	3,000
Public Works Commission Newsletter	115,000
South River Electric Newsletter	37,000
Lumbee River Electric Newsletter	46,000
Cumberland County Fair	35,000
Fayetteville State University Health Fair	550
Spring Lake Utility Insert	8,098
Fayetteville Chamber of Commerce	1,500
Clark Park Spring Nature Fair	900
Fort Bragg Military Reservation	4,000
Cape Fear and Pine Forest High School Environmental Curricula	482
MPO Transportation Public Interest Meeting	50,000
Up and Coming Magazine	15,000
Fort Bragg Military Reservation TV Channel	5,000
Cumberland County Community TV Channel	TBD

Figure 12. FAMPO's *It All Adds Up to Cleaner Air* Program Results

7.4 Quantitative Evaluation of Travel and Emissions Reductions



Eric Schreffler
Electronics System-Integration
Technology Conference

Background

Many communities throughout the country conduct air quality alert or action day programs to encourage people to reduce their driving on days forecasted to violate air quality standards. The California Air Resources Board (CARB), EPA, FHWA and several California air districts funded ESTC to develop a method for quantifying the travel and emission impacts of these programs, particularly for Sacramento and San Francisco's Spare the Air program. The objectives of this research project were to:

- develop a method to quantify trip and emission reductions, particularly for a community-based episodic education program;
- ensure that the method be affordable while also maintaining accuracy and rigor;
- include a correction to adjust for survey findings; and
- be deemed an acceptable measure by EPA for SIP credit.

Overview

Without program evaluation a community cannot assess whether their program is effective. Evaluating a public outreach program for SIP credit requires a quantitative assessment of the program's anticipated emission reductions measured against actual emission results. Therefore, by measuring the emission reductions from an outreach program, communities can:

- qualify for SIP emission reduction credits;
- satisfy measurement requirements in EACs;
- evaluate the cost-effectiveness of programs and services;
- learn how air quality alert or action programs affect travel behavior;
- document CMAQ-funded program impacts;
- demonstrate conformity between transportation and air quality plans;
- provide program managers with feedback on results.

The method involved collecting data to compare the travel behavior of the same individuals on *Spare the Air* and non-*Spare the Air* days (those who reduced trips) and nonparticipants.

Outcomes

Most public outreach programs have little experience with impact quantification, and therefore gathering data to measure emission reduction is a major challenge. Mr. Schreffler noted that the benefits of program evaluation go beyond documenting SIP credit to also show the bottom line results of an air quality program.

Schreffler, Eric N.: Quantification Methods for Identifying Emissions Reductions Resulting from Seasonal and Episodic Public Education Programs: Final Research Report and Attachments; ESTC contract #98-318 with California Air Resources Board; 2003. Also see, www.arb.ca.gov/research/abstracts/98-318.htm or contact Eric Schreffler, estc@san.rr.com.

7.5 Types of Evaluation Research and Their Uses for Measuring Program Performance



U.S. Department of Transportation
Federal Highway Administration

Kathy Daniel
FHWA

www.fhwa.dot.gov
<http://www.italladdsup.gov/>

Background

Outreach programs are an important part of local and regional efforts to reduce traffic congestion and air pollution. The programs are intended to inform the public about the correlation between transportation choices, traffic congestion and air pollution and identify steps people can take to ease improve air quality. They help people understand why mandatory vehicle inspection and maintenance or HOV lanes are necessary.

An important element in a public outreach program is changing the public's awareness and attitudes. This change can be measured with cost effective and timely evaluation research, enabling program managers to set objectives, focus on accomplishments, set expectations, and justify and account for the program.

Overview

There are four main types of evaluation research:

1. **Formative evaluation**, which uses focus groups to learn how the target audience feels about program strategies, messages and materials.
2. **Process evaluation**, which involves measuring an outreach program's performance against its objectives. It All Adds Up To Cleaner Air provides participants with a Process Evaluation Workbook providing a systematic approach for determining objectives, recording activities, calculating the results.
3. **Impact evaluation**, which uses surveys to measure how effective communications are raising awareness and knowledge. In crafting a survey it is important to plan ahead, establishing clear objective; professional assistance can be helpful in this process.
4. **Outcome evaluation**, which assesses the connection between an initiative and long term outcomes. This is often difficult, expensive and time consuming; however, monitoring outcomes such as changes in VMT, days in attainment, and behavior change is also effective.

Outcomes

Evaluating program performance and administering surveys can be costly, so it is suggested that evaluation budgets be limited to 10 percent of the entire program cost. Communities have an option to take advantage of pro bono assistance or graduate school programs, provided they are less expensive than firms and can meet the deadlines.

Evaluation resources measure the impact of communications, awareness, knowledge and attitudes of the public outreach initiatives. They support accountability, effectiveness and improvement of the program. It is important to share the research findings within the organization, as well as with community leaders, program partners, the public and others in the It All Adds Up program.

www.ItAllAddsUp.gov

This website includes evaluation research information, with links to other evaluation resources such as directors of suppliers, a Process Evaluation Workbook to help community organizations set their objectives and track progress; and two Impact Evaluation Surveys that communities can use to measure changes in people's awareness and attitudes.

Workshop Eight, June 28, 2004: New National Ambient Air Quality Standards: Vital Information on Planning for Air Quality

NARC held the eighth in a series of workshops addressing integrating air quality and transportation planning in Chicago, Illinois, on June 28, 2004. This workshop outlined the new NAAQS and how they affect COGs and MPOs. It stressed the importance of involvement from all levels of government and from all stakeholders. Several case studies presented regional perspectives in dealing with air quality in the face of growth and development.

The questions addressed include:

- What are the new NAAQS?
- What implications will these standards have on new and existing nonattainment areas?
- How will COGs and MPOs implement new policies to meet the new NAAQS?

Workshop eight outlined how regions can approach air quality planning in order to achieve conformity of the new 8-hour NAAQS. It emphasized the involvement of all stakeholders in the process and continual consultation with regulatory agencies. It also described the EAC option and several ways to incorporate air quality planning in SIPs.

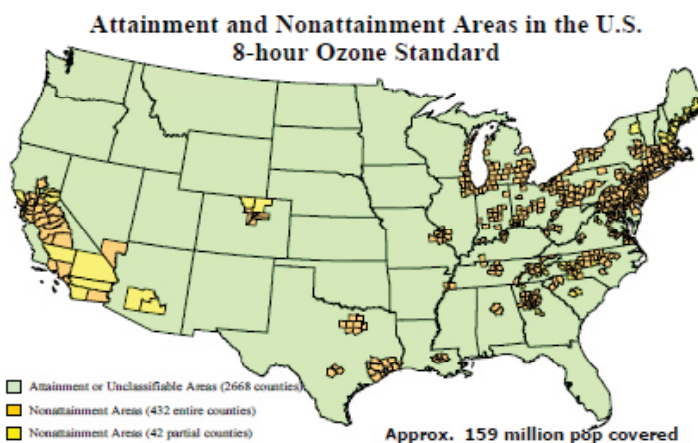


Figure 13. Attainment and Nonattainment Areas for the 8-hour Ozone Standard

Workshop Topics and Presenters

- 8.1 8-Hour Ozone NAAQS: Implications for New and Existing Nonattainment Areas
John Silvasi, EPA, gave a detailed overview of the implications of the NAAQS on new and existing nonattainment areas, as well as sanctions for noncompliance.
- 8.2 Conformity Under NAAQS: Impacts on the Planning Process
Reggie Korthals, EPA, provided an overview of the most important conformity issues for the new NAAQS.
- 8.3 New NAAQS and Its Effect on Apportionment of CMAQ Funding
Jim Thorne, FHWA, examined the effect of the new NAAQS on the CMAQ program.
- 8.4 New Air Quality Standards: Atlanta's Response
Tracy Clymer, ARC, described Atlanta's approach to planning for the 8-hour ozone and PM2.5 standards.
- 8.5 The Air Quality Planning Process
Mike Rogers, Illinois EPA, focused on the changing air quality planning process at the regional level and how it affects the SIP.

- 8.6 Regional Perspectives on Implementing New NAAQS
Patricia Berry, CATS, focused on how CATS uses a consultation process to facilitate concurrent review by the regulatory agencies and to anticipate and address potential challenges to the planning process.
- 8.7 Central Texas Early Action Compact: Why We Chose the Early Action Compact
Cathy Stephens, Capital Area Metropolitan Planning Organization (CAMPO), explained the EAC CAMPO chose and its impacts on the planning process.
- 8.8 Air Quality Planning Activities in the UNIFOUR Region of North Carolina under the New NAAQS
John Tippet, Western Piedmont Council of Governments (WPCOG), explained how the Unifour region in North Carolina developed a timeline to meet the new air quality standards, emphasizing their accomplishments on numerous ozone control measures.
- 8.9 Case Studies on Preparation for New NAAQS
Jonathan Makler, IBI Group, explained statewide conformity preparation efforts in North Carolina.

8.1 8-Hour Ozone National Ambient Air Quality Standards: Implications for New and Existing Nonattainment Areas



Background

Two important rules relating to the new NAAQS were adopted on April 30, 2004. The first rule states that EACs for the new 8-hour ozone NAAQS become effective June 15, 2004. The second rule describes the transition requirements from the 1-hour to 8-hour ozone designation.

John Silvasi
U.S. EPA
www.epa.gov

Overview

Under the new NAAQS, 432 counties and 42 partial counties make up the 126 ozone designated areas. Most of these designated areas are in the northeastern U.S. Under the 8-hour rule, strict requirements are not mandated for the 84 out of 126 areas that remain unclassified. The remaining areas, classified as marginal, moderate, serious or severe nonattainment, must follow more prescriptive requirements.

The 1-hour ozone designation will be revoked June 15, 2005, one year after the effective date of designation. Under the anti-backsliding provisions, areas are still required to use very specific control measures for the 1-hour standard. These applicable requirements must stay in place at least until an area can obtain the 8-hour standard. The second phase of the 8-hour ozone implementation rule will address reasonably available control measures, attainment demonstrations and modeling requirements, new source review and other requirements.

The federal CAA requires the EPA to impose sanctions on a state if it fails to submit a timely SIP; if it fails to implement an approved plan; or if the EPA does not approve the plan after the grace period. Two sanctions are available:

- Any new large industrial facility that emits VOC or NO_x in the case of ozone built in the area must find offsets equal to twice its proposed emissions. This is known as the 2:1 offset.
- A prohibition of federal funding for new highway projects (safety and air quality improvement projects are exempted from this sanction).

The CAA does not sanction areas for failure to attain standards. If a classified area (e.g., marginal, moderate, serious) fails to meet the ozone air quality standard by its attainment date, it gets “bumped” to

the next classification. Severe and extreme areas, however, are subject to the penalty fee provisions of Section 185 for failure to attain. An area with a higher classification must meet the requirements of the next category (and is given additional time to meet the standard).

Outcomes

There are many requirements for noncompliant counties. To meet the requirements of the CAA, most 8-hour ozone nonattainment areas will be required to submit a SIP to the EPA by April 2007. Through their SIP, states will design their approach to reducing emissions or ozone precursors and the ozone level in the air.

After an area is designated nonattainment, the local MPO must meet the deadlines for achieving the NAAQS as mandated by the 1990 Amendments to the CAA. These deadlines range from the years 2007 to 2021 depending on the severity of the ozone problem in each area. In the interim, the nonattainment area must demonstrate that they are making reasonable further progress toward improving air quality.

Educating the public on the pollutants and their health effects is also an important part of the process of achieving attainment.

8.2 Conformity under NAAQS: Impacts on the Planning Process

Background

To accomplish conformity, emissions from an area's transportation network are evaluated before a region's plans; TIPs and projects are approved or funded. This is an important step in coordinating air quality and transportation planning.

Overview

The July 1, 2004 revisions to the transportation conformity rule address three objectives:

1. They provide rules for demonstrating conformity under the new 8-hour ozone and PM_{2.5} air quality standards.
2. They incorporate EPA and U.S. DOT guidance that resulted from the March 1999 court decision.
3. They include several provisions that streamline and improve conformity implementation.

MTPs and TIPs in new nonattainment areas must achieve conformity within one year of the effective date of designation, which is June 15, 2005 for 8-hour ozone areas. After this date, conformity also will be required before any FHWA or FTA project approvals. All current 1-hour ozone nonattainment and maintenance areas must continue to comply with the conformity rule's 1-hour provisions.

On June 15, 2005, the 1-hour standard will be revoked for all but the EAC areas. After the revocation date, most areas will no longer be required to determine conformity for the 1-hour ozone standard. After the EPA finds 8-hour ozone or PM_{2.5} budgets adequate or approves them, the area must use those budgets in future conformity determinations. Eight-hour ozone areas that do not have 1-hour ozone budgets will use the interim emissions tests required by the rule. Marginal and basic areas may choose either the "build-no-greater-than-no-build" test or the "no-greater-than-2002" test, meaning that build emissions must be less than or equal to either no-build emissions or 2002 baseline emissions.

Before 8-hour budgets are found adequate, areas with existing 1-hour budgets will use them for 8-hour conformity determinations, unless through an area's consultation process another test is deemed more appropriate for meeting CAA requirements. Using the 1-hour budgets ensures that these areas continue progress and that they will attain the 8-hour standard by their deadlines. The primary criterion in this



Rudy Kapichak
U.S. EPA
www.epa.gov

decision is whether the existing 1-hour budget meets the CAA requirements to not worsen air quality or delay timely attainment.

Prior to PM2.5 budgets being found adequate or approved by EPA, all PM2.5 nonattainment areas may choose between the “build-no-greater-than-no-build” or the “no-greater-than-2002” tests. Further, the final rule requires that all regional emissions analyses in PM2.5 areas consider PM2.5 from motor vehicle tail pipes, brake wear and tire wear.

Conformity determinations must demonstrate timely implementation of TCMs, regardless of what standard the SIP covers. Therefore, any 8-hour conformity determination must demonstrate timely implementation of the TCMs developed for the 1-hour standard as long as they remain in the SIP.

Outcomes

The July 1, 2004 final rule included several provisions to streamline the conformity process, such as the list of events that trigger conformity determinations. Additionally, the point for the determination of latest available planning assumptions was changed from the point of DOT’s conformity determination to the point when an area begins its regional emissions analysis.

Amendments necessitated by the March 1999 DC Circuit Court decision include: incorporating the process used to determine whether emissions budgets submitted in the SIPs are adequate for conformity purposes into a rule, and revising provisions related to projects that can proceed during a conformity lapse.

8.3 New NAAQS and Its Effect on Apportionment of CMAQ Funding



U.S. Department of Transportation
Federal Highway Administration
Gary Jensen
FHWA
www.fhwa.dot.gov

Background

The CMAQ Program was created by ISTEA, reauthorized by TEA-21 and is expected to continue in the next reauthorization. The CMAQ program focuses on transportation projects that reduce emissions in nonattainment and maintenance areas. CMAQ funds are apportioned by population and factor in the severity of 1-hour ozone nonattainment classification, including carbon monoxide in nonattainment and maintenance areas. To date, \$13 billion has been invested in 15,000 projects.

Overview

The new NAAQS will affect CMAQ funding. With implementation of the new ozone standard, no counties will be removed from CMAQ funding eligibility in the short term. In FY 2006, only 8-hour nonattainment areas will remain in the funding formula. Carbon monoxide nonattainment and maintenance areas will still receive CMAQ funding.

Outcomes

The new NAAQS will result in a net increase of nonattainment counties with a projection of over 120 new ozone nonattainment areas, as well as over 100 new PM2.5 nonattainment areas. The next transportation authorization may provide an increase in CMAQ funding to \$8.9 billion.

8.4 New Air Quality Standards: Atlanta's Response



ATLANTA REGIONAL COMMISSION

Tracy Clymer

ARC

www.atlantaregional.com

Background

Atlanta's urbanized area includes 19 counties. As of January 2004, thirteen of these counties were reclassified from serious to severe nonattainment under the 1-hour ozone standard. Twenty counties surrounding Atlanta were designated marginal under the 8-hour ozone standard. Implementation of the PM_{2.5} standard was also underway in 2004. Atlanta's final nonattainment area will be between 20-22 counties in size.

Implementation of two new air quality standards, combined with Atlanta's unprecedented growth and the challenges of education, interagency consultation and legal conflicts made air quality improvement and implementation of transportation conformity requirements a focal point.

Overview

ARC's immediate milestones include the SIP submittal as a severe nonattainment area under the 1-hour ozone standard by July 2004 and conformity determination under both the 1-hour and 8-hour standards by January 2005. Different classifications under different standards make it difficult to inform planning partners about the state of air quality in the region. Consequently, extensive outreach is needed to explain transportation conformity and CAA requirements in both ozone and PM_{2.5} nonattainment areas.

ARC prepared a half-day workshop on transportation conformity and transportation and air quality planning in Atlanta for all member jurisdictions and planning partners. TransAQ is a subgroup of ARC's Interagency Consultation process. The group includes representatives from ARC, Georgia DOT, Environmental Protection Division, and Regional Transportation Authority, and meets on an as needed basis to discuss handling of technical and policy issues related to conformity.

Litigation, which can greatly strain resources and slow the planning and conformity process, remains a potential challenge. ARC has pushed for tedious documentation and a sound demonstration of the logic behind the decision-making process as a precaution against litigation.

Outcomes

The overall requirements to implementing the new air quality standards involve strategic and proactive planning; outreach with partners and stakeholders; technical preparation; well-trained staff; and strong support from upper management for an inclusive and technically rigorous process.

Challenges encountered thus far include:

- **Rules Not Available in Timely Manner:** Planning commissions can only make limited progress before rules are finalized.
- **Potential for Regulations to Lead Science:** Under the PM_{2.5} standard transportation conformity will be completed for the first time using tests that are not yet defined.
- **Significant Resource Issues as Areas Transition to New Standards:** Estimates of the financial burden on affected areas as they implement conformity measures were underestimated at the federal level. Application requirements for expanded nonattainment area and additional testing, consultation costs for technical expertise, technical machinery, and inevitable litigation will also increase costs.
- **National-Level Legal Challenges:** Most issues regarding conformity will ultimately be decided by the courts, delaying implementation, depleting agency resources, complicating the public outreach process, and disrupting planning efforts.

- **Issues beyond MPOs' Control:** There is difficulty in predicting future air quality conditions, making planning extremely challenging.

8.5 The Air Quality Planning Process



Background

Preparation, development, and implementation of a SIP draw resources and expertise from all levels of the planning community and government. State and Regional Air Quality Agencies, the EPA, MPOs, State DOTs, and the U.S. DOT, interest groups and public stakeholders are all involved in the SIP process.

Mike Rogers
Illinois EPA

www.epa.state.il.us

The state takes the primary role in developing the SIP by maintaining air quality monitoring networks that provide data. Developing an inventory of pollutant emissions and sources is the first step in preparing a regional SIP. The levels of emissions must then be projected to the future attainment date. The CAA contains requirements for incrementally reducing pollutant emissions. Reasonable Further Progress (RFP) provisions require that areas reduce their pollutant emissions by three percent per year averaged over three years.

Overview

The emissions inventory developed by the state and local air agencies is a comprehensive listing of air pollutant emissions. The purpose is to estimate the baseline emissions and project future emissions levels for each targeted pollutant, enabling planners to quantify reductions from certain control strategies. This process determines reductions needed for attainment or maintenance, which will be included in the SIP. SIP Inventories include point sources emissions, area sources emissions, on road mobile source emissions and non-road mobile source emissions.

MOBILE6.2 is the EPA's updated emissions factor model that generates emissions factors for on-road vehicles. It estimates emissions factors for CO, NO_x, hydrocarbons, Hazardous Air Pollutants (HAP) and particulate matter, as well as exhaust, evaporative, and refueling emissions factors. It is able to calculate these emission factors in grams per vehicle mile as function of speed by facility type. The model also incorporates vehicle registration data, vehicle classification, vehicle speeds, and trip starts per day.

The SIP modeling inventory is required for developing ozone attainment plans, including information on current and projected emissions activities from sources within and surrounding a nonattainment area. When an emissions inventory is complete, control measures and the motor vehicle emissions budgets are set, creating a system geared toward effective change.

Major parts of a control strategy are the motor vehicle emissions budgets used by MPOs in conducting transportation conformity. Each such SIP budget has a ceiling on emissions for the planned transportation system. Motor vehicle emissions resulting from the implementation of LRTPs and TIPs must be below the motor

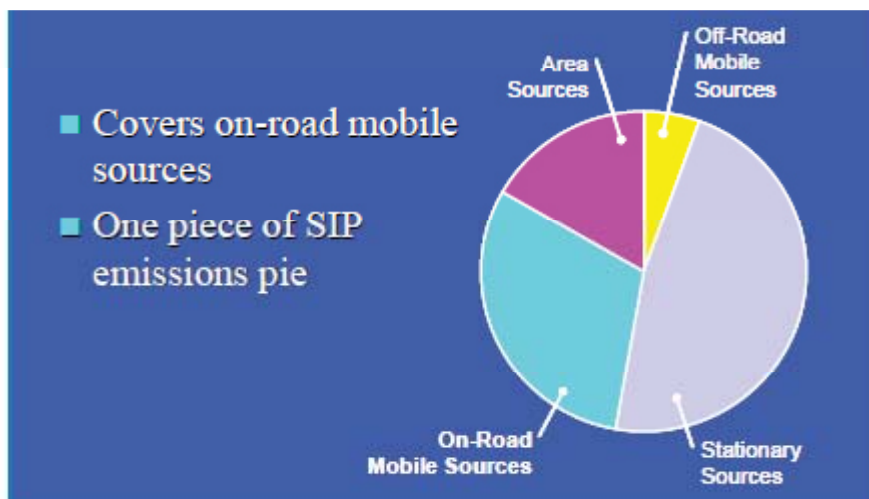


Figure 13. Illinois SIP Motor Vehicle Emissions Budgets

vehicle emissions budget level established in the SIP to enable areas to reach attainment, maintenance, or specific RFP requirements. Thus the SIP establishes legal limits on emissions.

Before MPOs can perform transportation conformity determinations, the EPA must find the motor vehicle emissions budgets adequate. EPA generally uses the same criteria to approve the budget as it would the entire SIP, creating a uniform system of evaluation. Once the budget has met the criteria, the state submits the full SIP to the EPA. There is an official 90-day process with a public comment period during which the EPA may find the SIP adequate or inadequate. Final approval of the full SIP takes a longer period of time.

Outcomes

There are many challenges in planning for conformity with the new NAAQS. Local air quality agencies must work with state and local authorities to create effective data. Pollutants must be classified and modeled correctly, taking into account things such as transported pollution from upwind areas. Due to the bureaucratic nature of the process, and the potential for litigation, it can take several years to develop the SIP.

8.6 Regional Perspectives on Implementing New NAAQS



Background

CATS is the MPO for Northeastern Illinois, with a 20-member Policy Committee that develops and approves all regional transportation plans and programs for the area. The Council of Mayors encompasses 272 municipalities organized into 11 subregional councils, serving as an important link between the MPO and municipalities. The subregional councils appoint two mayors each to serve on the Council of Mayors Executive Committee, whose chairman sits on the Policy Committee.

Patricia Berry
CATS
www.catsmpo.com

CATS' Work Program Committee (WPC) is organized to review all issues that will come before the Policy Committee for resolution. The WPC has a representative from each Policy Committee member agency, plus six additional members.

Overview

Shared Path 2030 is a comprehensive process for developing and updating the LRTP for northeastern Illinois. The consultation team for *Shared Path 2030* is composed of representatives from the federal and state EPA, the state DOT, RTA and CATS. As each deadline for conformity, plans, and programs are established, the team works to assure concurrent review and to help identify and resolve potential challenges. Other Policy and Work Program Committee members participate in the consultation process as appropriate when the challenges involve their projects, policies or strategies. The consultation process has been extremely beneficial in assuring timely approval of all of CATS' plans and programs.

Outcomes

Although an extensive process has been put in place to deal with all transportation initiatives, it has involved a tremendous commitment of staff time because information from many stakeholders must be considered and many tasks must be performed concurrently.

8.7 Central Texas Early Action Compact: Why We Chose the EAC



Cathy Stephens
CAMPO

Background

Through an EAC, areas may defer nonattainment status by developing a Clean Air Action Plan (CAAP). An EAC is similar to an ozone nonattainment SIP and includes an 8-hour attainment demonstration and emission reduction measures. The CAAP includes existing state and federal measures, new mandatory measures, and voluntary measures. During CAAP implementation there must be a continual planning process and semiannual reporting to meet mandatory milestones. Public and stakeholder participation is also required. The Austin Round Rock MSA, made up of Bastrop, Caldwell, Hays, Travis and Williamson Counties and seven cities, signed an EAC in December 2002.

Overview

The Austin Round Rock MSA chose the EAC as a faster alternative to reach a clean air standard. Not only did they feel that current air quality was poor, but they also felt an EAC was a better strategy for the local economy. A nonattainment status could negatively affect local economic development, because emission control equipment would increase consumer costs and limit business expansion. It would also delay transportation projects and dilute resources from other projects to meet compliance needs.

In order to effectively accomplish these goals, an infrastructure was developed and responsibilities were divided. Parties involved included the Clean Air Coalition, the EAC Task Force, the Clean Air Force, and the Capital Area Planning Council. The public also played an important role, with four stakeholder work groups focused on point, area, non-road, and on-road sources of pollution. Two public opinion surveys were conducted to obtain as much public opinion and participation as possible.

Similar to an SIP, a CAAP must make policy statements, have sound technical analysis, use public and stakeholder involvement, develop emission reduction measures, continue the ongoing planning process, and track and report all findings in a timely fashion. CAAP requirements include modeling updates and assumption verification as well as consideration and evaluation of future transportation patterns and their impact on air quality. They must also project the most current trend and projections of local vehicle emissions.

In order to provide sound emissions analysis, the Transportation Emission Reduction Measures (TERMs) must be identified and quantified. The CAMPO region identified 467 TERMS to reduce VOC and NOx through 2012. TERMS tracking and reporting provides expected implementation dates and emission reductions, as well as substitution options if project is delayed or cancelled. CAMPO also created a Commute Solutions Program, which involves a training program for employer transportation coordinators and develops commute solution fairs, ride matching, and a commute solution month.

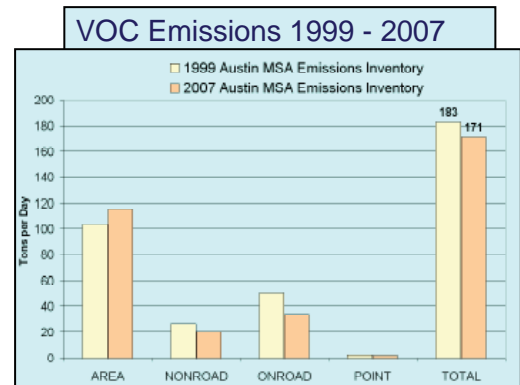
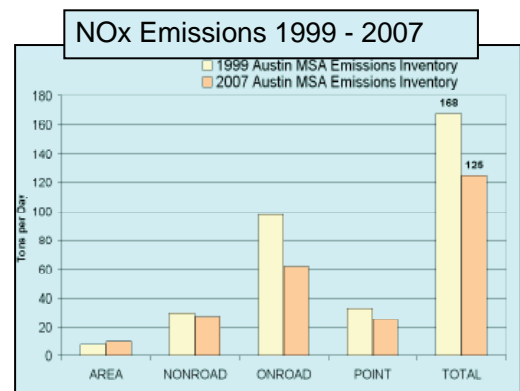


Figure 15. NOx and VOC Emissions in Central Texas (1999-2007)

Outcomes

The Texas Commission on Environmental Quality will adopt the CAAP by December 2004, after which the region will implement the state and local emission reduction measures. The region found it was important to be aware of leadership changes at all levels, involve stakeholders, and set realistic goals.

8.8 Air Quality Planning Activities in the UNIFOUR Region of North Carolina under the New NAAQS



John
Tippett
WPCOG

www.wpcog.org

Background

In January 1999, Western Piedmont Council of Government learned that the ozone levels in the Unifour Region (Lenoir, Hickory, Morganton and Taylorsville, North Carolina) violated the new 8-hour standard. In November 1999, the Catawba County Air Quality Committee (CCAQC) was created to and in December 2002 the region signed an EAC.

Overview

CAQC had their first public hearing in Western North Carolina on proposed new nonattainment designation. They successfully hosted two “Care for the Air” awareness races, lobbied for Hickory Ozone Forecast, formed Unifour Air Quality Coalition to receive the Ozone Forecasts, formed the Unifour Air Quality Committee and assisted Catawba and Hickory counties develop Air Quality Action Plans.

CAQC assisted in the development of Hickory-By-Choice Land Use and Transportation Plan and the Small Area Plans in Catawba, Caldwell, and Burke Counties. They also developed the Transportation Demand Management Program and Compressed natural gas facility and vehicles.

In December 2002, the Unifour EAC was formed. As a result ozone control measures were created. These measures included:

1. Involving local governments and private sector in the North Carolina Air Awareness Program;
2. Enhancing Ozone Awareness;
3. Participating in the Clean Cities program;
4. Creating City and County Energy Plans;
5. Assigning staff to become air quality contacts;
6. Adopting a local clean air policy and appointing a stakeholder group;
7. Creating landscaping standards;
8. Implementing Smart Growth, mixed-use and infill development policies;
9. Enforcing smoking vehicle reports and requiring repairs;
10. Prohibiting open burning on ozone action days;
11. Supporting coordination of MPO and RPO efforts;
12. Encouraging the use of compressed work weeks or flexible work hours;
13. Expanding transit and ridesharing programs; and
14. Improving traffic operational planning, engineering, and maintenance.

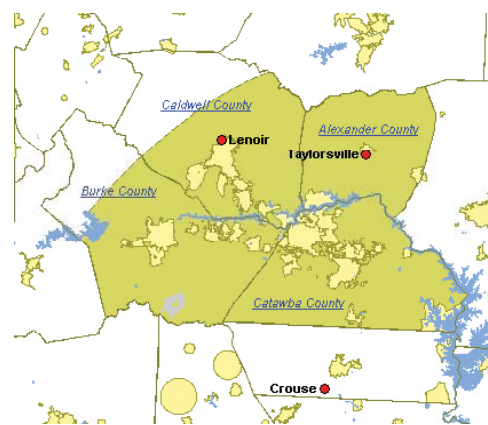


Figure 16. Map of Hickory Ozone Forecast Area

PM2.5 is also an increasing problem in the area. There is a section in central North Carolina that may be in nonattainment based on EPA's presumptive MSA boundary guidance.

Outcomes

The difficulty in the air quality planning process lies in the coordination and cooperation between various levels of government and public and private stakeholders. Although CCAQC has accomplished many objectives by forming the EAC, several steps remain to avoid nonattainment.

8.9 Case Studies on Preparation for New NAAQS



Background

North Carolina had high growth during the 1990s, resulting in significant transportation investments. The ozone outlook from 2000 to 2002 showed that there were numerous severe nonattainment violations and many moderate nonattainment violations under the new NAAQS.

Jonathan Makler
IBI Group
www.ibigroup.com

Overview

The state developed two strategies to address the new NAAQS:

- *Minimize*: North Carolina proposed partial county nonattainment designations to achieve necessary control with minimal burden on communities.
- *Mitigate*: In 1998, the North Carolina Clean Air Act expanded Inspection and Maintenance to 49 counties. In 2002 the Clean Smokestacks Act imposed new stationary source restrictions, especially on coal-fired power plants.

In addressing conformity lapses there were many concerns about economic impacts on certain areas, especially for major road-building initiatives around the state. There were also concerns regarding the burden of performing conformity determinations on the state Division of Air Quality (DAQ) and DOT.

The state DOT and researchers at N.C. State's Center for Transportation and the Environment (CTE) saw a critical need for communication and cooperation in fall 2000. With the partnership of DAQ, stakeholders were convened to discuss conformity in May 2001. Within this forum they developed a target audience, outreach strategy, and the overall message to involve decision-makers within local government and key state agencies.

Due to the delayed implementation of these new standards, enthusiasm from efforts in 2000 and 2001 was depleted; designation-related activities and personnel changes were a major drain on DAQ resources; and, the formation of EACs also limited staff resources. As a result the roundtable created earlier took a back seat in the designation process.

Recently, interagency consultation on nonattainment designations suggested that roundtable and related activities did positively impact awareness at peer agencies. Because of EACs and improved air quality, the roundtable forum has been refocused on new counties in Charlotte and Triangle nonattainment areas and, potentially, any EAC dropouts.

Outcomes

Building awareness and consensus among local officials is extremely beneficial. Within this forum, policy can be developed, resources allocated, and goals integrated. There were many challenges to this process, including participants' time constraints, a lack of trained staff to communicate technical concepts with decision-makers, and a need to build local officials' technical capacity.

Workshop Nine, February 8, 2005: Environmental Impacts of Transportation Planning, Land Use, Air and Water Quality

NARC held the ninth in a series of workshops addressing integrating air quality and transportation planning in Washington, DC, on February 8, 2005. This workshop outlined issues of importance to MPOs and COGs in addressing land use, air and water quality, and growth in their LRTPs.

The questions addressed include:

- How can communities plan to compensate for increases in development and VMT while protecting air and water quality?
- How do planners, local elected officials, and citizen activists integrate land use, air and water quality planning?
- What is scenario planning and how will it help achieve the goals of sustainable growth?
- How can professionals promote smart growth to the general public?

Workshop 9 described strategies that COGs and MPOs can use to control growth and create sustainable communities. It presented scenario planning as a way to involve the public in developing feasible, environmentally sensitive plans. Speakers also emphasized utilizing existing transportation infrastructure and mixed land use policy as a way to achieve smart growth. It addressed some of the tools and processes currently used to create sustainable communities. Presentations also included case studies describing the benefits of scenario planning, regional planning alternatives and visioning that can be addressed in the LRTPs.

Workshop Topics and Presenters

- 9.1 What if the Washington Region Grew Differently?: Public Forum on Alternative Transportation and Land-Use Scenarios
John Swanson, MWCOG, focused on a study of alternative land use and transportation options for the Washington, DC region, featuring “what if” scenarios for the housing boom in the outer suburbs, the jobs and housing imbalance and the potential for higher density development.
- 9.2 Transportation Conformity and the 8-Hour Ozone Standard
*Joan Rohlf*s, MWCOG, focused on integrating transportation and air quality planning, specifically addressing transportation conformity and the new 8-hour ozone standard.
- 9.3 Transportation and Water Quality: Causes, Effects and Solutions
Ted Graham, MWCOG, explained the link between transportation and water pollution in the Washington, DC region.
- 9.4 Integrating Watershed Planning with Transportation Planning
Robert Goo, U.S. EPA, explained the importance of a coordinated resource perspective when approaching complex interactions between land use development, transportation systems and water resource protection.
- 9.5 Bay Regional Atmospheric Chemistry Experiment (BRACE)
Suzanne Cooper, Tampa Bay Regional Planning Council (TBRPC), focused on efforts by BRACE and the local community to address air and water pollution in Tampa Bay.

- 9.6 **Blueprint for the Future**
Tom Cosgrove, Sacramento Area Council of Governments (SACOG), focused on SACOG's comprehensive Blueprint Plan examining growth and development in the Sacramento region over the next 50 years.
- 9.7 **Implementing A Smart Growth Land Use Pattern to Manage Congestion: Results From the *Regional Growth: Choices for Our Future* Project**
Paul Hamilton, Tri County Regional Planning Commission (TCRPC), showcased how TCRPC created an integrated transportation and land use plan for their region.
- 9.8 **FHWA Scenario Planning Initiatives**
Sherry Ways, FHWA Office of Planning, focused on the importance of scenario planning and how FHWA facilitates cooperation and information sharing.
- 9.9 **Maturing the Role of Transportation in Metropolitan Areas**
Michael Morris, NCTCOG, focused on how NCTCOG's transportation planning division has moved towards building a more comprehensive sustainable planning process.
- 9.10 **Holistic Approach to Metropolitan Transportation Planning**
John Poorman, Capital District Transportation Committee (CDTC), discussed the process by which CDTC developed a holistic approach to transportation planning.
- 9.11 **Iowa 44 Corridor Coordinated Land Use and Transportation Planning**
Tom Kane, Des Moines Area MPO (DMAMPO), focused on the initiatives taken by DMAMPO to create a sustainable transportation plan for the Iowa 44 corridor.
- 9.12 **Integrating Land Use and Transportation Planning to Address Air Quality Conformity**
Juanita Wieczoreck, Dover/Kent MPO, focused on the land use and transportation planning project initiated to reduce emissions through smart growth.

9.1 What if the Washington Region Grew Differently?: Public Forum on Alternative Transportation and Land Use Scenarios



Metropolitan Washington
Council of Governments

John Swanson
MWCOC

www.mwcog.org

Background

MWCOG covers approximately 3,000 square miles in Maryland, Virginia, West Virginia, and the District of Columbia. The National Capital Region TPB, housed at MWCOG, prepares a financially constrained, 30-year transportation plan for the region.



Based on this long-range plan, the TPB forecasts that between 2005 and 2030 population will increase 36 percent from 4.5 to 6.2 million; employment will increase 48 percent from 2.8 to 4.2 million; daily VMT will increase 37 percent from 109 to 150 million; and, freeway and arterial lane miles will increase 16 percent from 15,300 to 17,600 miles.

These forecasts show that the transportation sector will not be able to compensate for the increase in population and development in the region. Most transportation dollars will be needed for maintenance and oversight.

Figure 17. Map of MWCOG Region

Overview

Four key issues impacting the Washington, DC region's land use and transportation development include:

Issue # 1: Job Growth is Outpacing Household Growth

Forecasted job growth from 2010-2030 will increase by 800,000 while households will increase by only 400,000 in that same time period. Planners predicted that an additional 200,000 housing units will be needed to accommodate the job demand.

Issue # 2: Workers are Living Farther Away from Their Jobs

The average commute within the region is 30 minutes; however this is increasing as housing prices rise and people move farther away from the regional core.

Issue # 3: There is an East-West Divide in the Washington, DC Region

There are significant economic disparities between the eastern and western parts of the region. For example, from 1990-2000, job growth in the west increased 20 percent while in the east it increased only one percent.

Issue # 4: Most Growth is Located Outside Transit Station Areas

Given current trends, only 30 percent of job growth and 20 percent of housing growth between 2010 and 2030 will be within one half mile of transit stations.

Outcomes

If these trends continue, the Washington DC region will have difficulties accommodating transportation needs for its residents. MWCOG/TPB studied alternate scenarios for regional development. All four scenarios shifted growth to regional activity centers, which were designated by MWCOG and the TPB in 2002.

All scenarios would have positive impacts with transit use increasing and morning congestion decreasing. However, the impacts by 2030 would be modest because most of the housing forecast for 2030 is already in place (72 percent), with an additional 13 percent in place by 2010. As a result, only 15 percent of forecast households in 2030 were in play for the study. Although these scenarios are for a 2030 horizon, impacts from the suggested changes will extend beyond 2030.

The next phase will be to develop alternative transportation scenarios including new transit facilities, carpool lanes and high occupancy/toll (HOT) lanes. Synergistic combinations of land use and transportation scenarios will be a feature of the final stages of the study.

9.2 Transportation Conformity and the 8-Hour Ozone Standard

Background

According to the federal Transportation Conformity Rule, transportation plans and programs must be consistent with air quality goals. This process is used to guarantee air quality throughout the country is not worsened, that there are no new air quality violations, and that there will be no delay in attainment of air quality standards. The rule states that a Conformity Test must be implemented to link transportation planning and emissions reductions. This mobile emissions budget test is done at least every three years, or whenever there is a change to transportation plans, TIPs or regionally significant projects.

Overview

In January, 2003 Washington, DC region was designated as a serious nonattainment area for 1-hour ozone. MWCOG submitted the first part of their SIP for 1-hour ozone in September 2003 and the second



Joan Rohlf
MWCOG

www.mwcog.org

part in March 2004. By December 2003, EPA found that the region was “adequate for conformity” in their SIP. MWCOG completed the process and was granted conformity determination for 1-hour ozone standard in November 2004.

During MWCOG’s work to attain conformity for the 1-hour ozone standard, the new ruling for 8-hour ozone designations went into effect. Therefore, MWCOG used an interim emissions test to demonstrate 8-hour conformity until an 8-hour budget became effective.

Outcomes

MWCOG was designated an 8-hour ozone moderate nonattainment area. During the interim period MWCOG decided to use its 1-hour mobile emissions budgets to calculate the 8-hour ozone levels in their region. They included Stafford County, VA in the interim period between the 1- and 8-hour standards to integrate the area more efficiently in the future. MWCOG also set their Mobile Budgets for 2005, which was the attainment deadline for 1-hour ozone standard.

Although MWCOG has planned for large emissions reductions by 2010, they have stated that meeting the 8-hour standard will be a much more difficult task that will require all mobile and non-mobile reduction measures, including existing TCM. Transportation planners need to think about new development projects and the consequences in relation to new regulations.

For more information visit: www.mwcog.org/environment and www.mwcog.org/transportation

9.3 Transportation and Water Quality: Causes, Effects & Solutions

Background

The Washington, D.C. region is located in and around a large amount of water, including the Chesapeake Bay, the Potomac River, and numerous tributaries. The impacts of agriculture and development have adversely affected the region’s water quality; however, the Clean Water Act (CWA) and increasing pressure from community-based organizations have contributed to a greater commitment to clean these waterways.

Overview

As in most urban areas, there are many sources of transportation-related water pollution in the Washington, D.C. region, including vehicular emissions that contribute to nutrient overload. Of the total nitrogen load delivered to the Chesapeake Bay area, about 32 percent is attributed to atmospheric deposition, roughly half of which is from mobile sources. Uncontrolled runoff from paved surfaces causes stream-bank erosion and washes toxics, sediment, and trash into the water. In addition to these problems, poorly designed bridges and culverts break up the continuity of streams, disrupt stream flow, and impair the migration of fish.

Outcomes

Coordination and collaboration between transportation and water quality planners is imperative in order to save the area’s watershed system. To solve transportation-related water pollution problems, it is important to minimize VMT, which will reduce nitrogen input via air deposition. It also is important to better control and treat road runoff through stormwater control devices, street cleaning, or anti-litter campaigns, thereby reducing toxics, nutrients, and erosion, protecting habitat and limiting trash.



Ted Graham
MWCOC

www.mwcog.org

9.4 Integrating Watershed Planning with Transportation Planning



Robert Goo
U.S. EPA
www.epa.gov

Background

Increased VMT and congestion has led to increased pollutant loading of metals, hydrocarbons, and runoff of soot and sediment in watersheds throughout the country. These accumulated pollutants have caused direct and indirect consequences, leading to destruction of habitat and the degradation of human health.

In order to protect water quality, the focus should be protecting surface and ground waters as well as wetlands and riparian habitat. Watershed protection issues should be considered within the context of larger planning efforts and analyses should be conducted to determine whether potential development will impact water quality.

Overview

At current projections, the rate of land development is expanding at a faster pace than population growth. Poorly planned growth leads to habitat destruction, decreased species diversity, increased runoff and pollutant loading. As a result water and air quality degradation leads to higher costs for drinking water treatment, storm water infrastructure and stream and lake restoration efforts.

It is important for the community to establish and integrate water resource goals into regional transportation plans, as transportation systems have direct and indirect impacts on water quality and quantity. The following guidelines are oriented toward water resource protection:

- establish community goals for water resources in the watershed;
- direct development where most appropriate for watershed health;
- minimize adverse impacts of development on watershed health;
- promote opportunities for restoration;
- assess and prevent unintended consequences of federal, state or local decisions affecting watershed health;
- plan for safe, adequate and affordable water supplies as an integral part of growth;
- consider the cumulative impacts of growth management decisions on the watershed; and
- monitor and evaluate the success of initiatives.

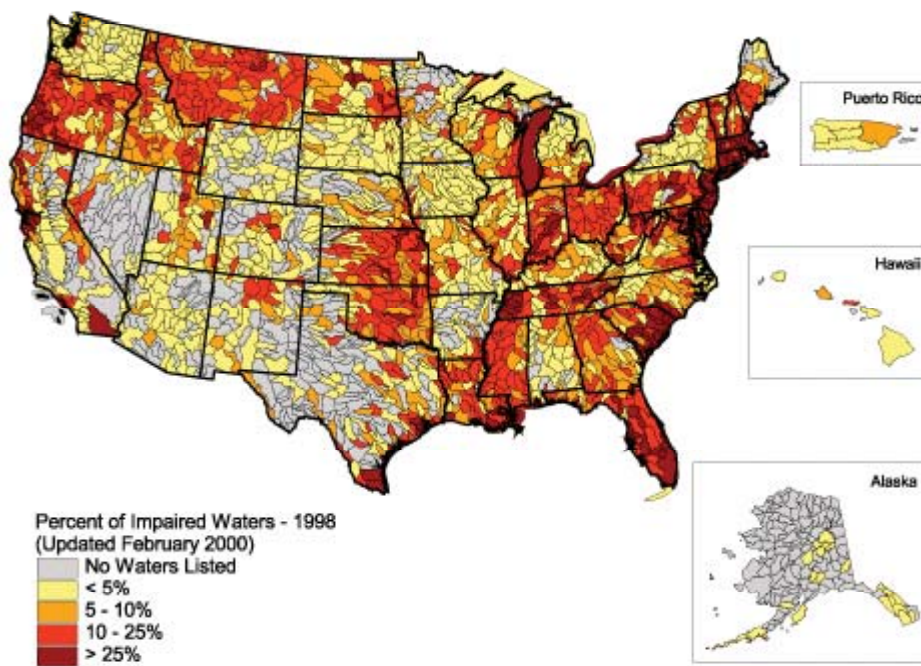


Figure 18. Map of Impaired Waters in U.S.

Using Low Impact Development (LID) strategies is another way to manage storm runoff. LID integrates land use planning, engineering, and storm water management designs to protect, maintain and restore the ecological functions and health of watersheds. It preserves or restores the hydrology of a watershed and can protect urban habitat, reduce pollution, reduce urban heat impacts, reduce water treatment cost, and provide aesthetically pleasing amenities.

Outcomes

There are many things that a community can do to promote smart growth and low impact development. Suggested approaches include:

- better coordination between MPOs and natural resource agencies;
- development of regional growth management plans;
- invest in improved data management systems;
- invest in models;
- share data;
- invest in more comprehensive resource inventories;
- integrate more environmental considerations into local land use planning;
- integrate plans: land use, air, and water quality;
- adopt a multi-disciplinary effort;
- promote public participation, i.e.: visioning (scenario planning);
- use water sensitive designs;
- engage in early and frequent communication; and
- conduct assessments, collect data information frequently.

A holistic approach combining transportation and land use planning is the most effective way to address transportation systems, economic and cultural concerns, and environmental protection. Engaging stakeholders in the planning process is helpful in achieving these goals.

For more information readers may want to refer to the following websites:

<http://www.epa.gov/watertrain/smartgrowth/resources/index.htm>

<http://www.epa.gov/livability/>

http://www.epa.gov/smartgrowth/pdf/waterresources_with_sg.pdf (Protecting Water Resources with Smart Growth)

9.5 Bay Regional Atmospheric Chemistry Experiment (BRACE)



Suzanne Cooper
TBRPC

www.tbrpc.org

Background

Tampa Bay is Florida's largest open water estuary spanning approximately 400 square miles. Since 1950, nearly half of the bay's marshes and 40 percent of its sea grasses have disappeared. Tampa Bay is a nitrogen-limited system, and in the last half century nitrogen loading has been linked to unwanted algae and loss of habitat. In 1991, the Tampa Bay Estuary Program found that atmospheric deposition was likely a minor problem. By 2003, they stated that it was "one of the most important issues facing restoration and protection of Tampa Bay."

Overview

BRACE was designed to improve estimates of the atmospheric nitrogen deposition to Tampa Bay, to apportion atmospheric nitrogen between local, regional and remote emission sources, and to assess Tampa Bay air quality before and after the TECO Gannon Station re-powering from coal to natural gas. In May 2002, BRACE evaluated the region's pollution by taking continuous samples of more than 100 air pollutants, using aircrafts to characterize urban air pollution, measuring nitrogen deposition, calculating real time aerosol concentrations and examining hourly vertical profiles of temperatures and winds.

Outcomes

BRACE yielded valuable information on wet versus dry deposition rates, occurrence of ammonia (NH_3) versus nitric acid (HNO_3), ammonia exchange at the bay surface, the role of sea salt in nitrate creation, source apportionment, and other information on the atmospheric chemistry of the region.

BRACE research found that:

- Atmospheric deposition makes up 40-50 percent of the 5,000 metric tons per year of inorganic nitrogen in Tampa Bay.
- Ammonia contributes to pollution as much as oxides of nitrogen; the Bay is both a source and a sink for ammonia.
- Sea salt reacts with nitric acid to form sodium nitrate and may reduce the local deposition of nitrogen.
- Highly time-resolved gas and aerosol measurements reveal contributions from local nitrogen sources.

The preliminary results also indicate that more than 35 percent of atmospheric deposition of nitrogen in Tampa Bay is non-local.

9.6 Blueprint for the Future

Background

The Sacramento area consists of six county MPOs and SACOG, which is overseen by a 32-member Board of Directors representing all regional 28 jurisdictions. Transportation planning is the Board's mission and is important because Sacramento is one of the fastest growing areas in California.



Tom Cosgrove
SACOG
www.sacog.org

Overview

SACOG created the Blueprint plan to sustain smart growth principles. It is a 50-year conceptual vision for the region's growth. SACOG will continually update the document with a two-plus year scenario planning exercise, preventing any contradictions between the Blueprint and regional transportation plans and SIPs.

A state-of-the-art modeling and decision-support visioning tool was created to develop the Blueprint. SACOG used interactive PLACE3S software to gather public feedback on alternative scenarios on housing, transportation, development, design and natural resource protection. Through the instant feedback available with the PLACE3S technology, SACOG identified the scenarios most popular with its constituency.

Outcomes

Although the scenario plans were widely accepted, SACOG has additional work before implementing the Blueprint plan. SACOG plans to develop a detailed map including all local jurisdictions, as well as individual strategies each jurisdiction would need to implement to carry out the next phase of the plan, which will require training for local governments and other parties.

9.7 Implementing A Smart Growth Land Use Pattern to Manage Congestion: Results From the *Regional Growth: Choices For Our Future Project*



Paul Hamilton
TCRPC
www.tri-co.org

Background

The Lansing, Michigan region is comprised of 78 units of government, 50 of which hold land use authority. Recently, moderate growth has caused urban sprawl and a loss of agricultural land. TCRPC conducted a scenario analysis for land use and transportation alternatives to create more sustainable growth and counteract sprawl.

Overview

Through the *Regional Growth: Choices for Our Future* project, TCRPC collected data on agricultural land, open space, preserved areas, total developed land, retail land, residential areas, population, household numbers and their surrounding properties, and transportation routes in relation to development. With this data, TCRPC made projections on community impacts. They created impact evaluations and set alternative Wise Growth principles to create a sustainable alternative to current development patterns.

Wise Growth Principles:

- increase access to community parks;
- protect natural areas and open space;
- decrease agricultural land consumption;
- increase access to transit;
- increase access to existing public services;
- decrease cost and expansion of future infrastructure; and
- reduce travel times by locating jobs and services adjacent to developed areas.

The transportation planning sector was intimately involved in this planning process. They took a large role in developing the plan and adopted the Wise Growth principles in their own plans.

TCRPC also created a *Regional 2025 Transportation Plan* aligned with the Wise Growth principles, adopting 29 principles in five different themes for regional land use – governmental, growth and redevelopment, transportation and other infrastructure, open space and resource protection, and healthy economy and healthy environment.

Outcomes

TCRPC conducted focus groups on their Wise Growth principles to evaluate regional consensus. Eighty-eight percent of the community leaders and 94 percent of the citizens surveyed agreed with the plan. TCRPC also created an integrated regional management and operations concept with a 20-year strategy, year by year project investments and maintenance as well as ways to more effectively coordinate these projects.

Scenario planning was used by TCRPC in order to alter transportation decision patterns. Their plan will help the region reduce transportation costs and mitigate adverse environmental impacts of pollution.

9.8 FHWA Scenario Planning Initiatives



U.S. Department of Transportation
Federal Highway Administration

Sherry Ways
FHWA Office of Planning
www.fhwa.dot.gov

Background

FHWA began work on scenario planning in September, 2003 with a National Scenario Planning Roundtable. Later that year, FHWA initiated a cooperative agreement with the University of Utah to fund research on synthesizing scenario-planning activities across the country. In April 2004, FHWA organized two national panel sessions on scenario planning at the American Planning Association's (APA) Federal Planning Division Annual Meeting and the APA National Conference in Washington, DC. They also made \$560 million in funding available for state and metropolitan transportation planning and partnered with division offices in New York, Rhode Island, and Hawaii to organize Scenario Planning Peer Workshops to generate interest and encourage local initiatives.

Overview

Scenario planning is a process in which transportation professionals and citizens work together to analyze and shape the long-term future of their communities. Using a variety of tools and techniques, participants assess trends in key factors such as transportation, land use, demographics, and health. Participants bring the factors together in alternative future scenarios, each of these reflecting different trend assumptions and tradeoff preferences with the goal of reaching agreement on a preferred scenario.

Federal agencies, State DOTs, MPOs, Transit Agencies, Local Planning Commissions, departments and agencies, business associations and Business Improvement Districts (BIDs), advocacy organizations and professional groups, and citizens and elected officials are all involved in scenario planning.

Scenario Planning enhances state and local professionals' ability to respond to change by

- helping to manage and prioritize use of limited resources;
- providing information to avoid potential consequences and to seize opportunities;
- providing tools to assess transportation's impact on communities; and
- facilitating consensus building among a wide variety of stakeholders.

Outcomes

In order to ensure the success of scenario planning initiatives, FHWA will continue to:

- encourage the use of Metropolitan Planning (PL) and other transportation funds to implement scenario planning;
- provide feedback on efforts being planned and implemented;
- identify resources and tools; and
- facilitate peer workshops.

9.9 Maturing the Role of Transportation in Metropolitan Areas



Michael Morris
NCTCOG
www.nctcog.org

Background

In the Dallas-Fort Worth area, there have been significant increases in VMT and congestion, with an estimated cost of congestion at \$12.4 billion in 2030. Transportation planners have

taken a comprehensive look at their community in an effort to combat these growing issues.

Overview

NCTCOG realizes that in order to positively impact transportation systems and the region's quality of life, they need to deal with the interaction between direct and indirect transportation issues. To do so, NCTCOG prioritized the importance of projects in their transportation plan with a focus on preservation and maintenance above new construction. Consequently, they focused on the management and operations of existing systems through ITS, Traffic Demand Management, and bike and pedestrian pathways. If building is a necessity, they prioritize HOV lanes and rail and bus systems.

Throughout this planning process, NCTCOG also keeps financial and air quality constraints in check and focuses on inter-modal and sustainable development initiatives. In order to meet financial constraints, NCTCOG's Regional Transportation Council created a sustainable development policy reviewing the utilization of existing system capacity, promoting mixed use development and the improvement of rail mobility and access management.

By evaluating these transportation alternatives in a scenario plan they were able to determine that a mix of these options was the best for sustainable growth.

Outcomes

Through this comprehensive planning strategy, NCTCOG estimated they could reduce VMT by approximately 20 million miles by 2025. This plan would also reduce \$1.3 billion in freeway and \$1.1 billion in arterial construction, thus reducing capital costs by 14.7 percent while saving 1.8 square miles of impervious surface from being paved. This plan would not only create a more efficient transportation system but also preserve the environment and assist in water conservation, which is an important quality of life issue in the region.

9.10 Holistic Approach to Metropolitan Transportation Planning



John Poorman
CDTC
www.cdtcmpto.org

Background

CDTC covers the Albany, NY region with an area with a population of 800,000 and stable, slow growth that includes poorly formed suburban expansion and urban fiscal challenges. Although there are a high number of pedestrians and transit users, there is a relatively low suburban density.

CDTC has a planning budget of \$1.5 million with a TIP budget of approximately \$100 million. The region has a strong political structure in its towns, villages, and cities. CDTC does transportation planning for all jurisdictions, separate from the regional planning board. CDTC realized in the early 1990's that their proposed plans for growth were relatively weak and therefore they sought to develop a more effective plan.

Overview

CDTC has the technical capability coupled with the analytic forum to create an effective transportation planning approach that is organic and holistic in scope. CDTC made an effort to involve all stakeholders in land use decision making to create an effective LRTP.

Through their collaboration, CDTC has developed various land use policies, including:

- a land use management plan required for capacity;
- mitigation fees expected and used for highway and transit maintenance;
- local planning context required for TIP candidates to receive funds; and

- urban revitalization serving as the priority for future development.

CDTC devoted its LRTP to land use planning, becoming the “go to” resource in the region on these land use issues. In the last four years they produced 35 linkage studies connecting local initiatives in a comprehensive regional vision, including plans for their transportation corridors. Currently the MPO administers mitigation fee calculations and local research initiatives.

Outcomes

CDTC’s policies and practices have led to an increased awareness about land use planning. They have improved the overall quality of local planning and increased the use of professional staff while simultaneously constraining the highway capacity budget. These positive results have heightened regional influence on local planning initiatives.

As a result, CDTC has focused its transportation planning within the context of other planning initiatives and developed a regional planning consensus. This regional vision promotes economic vitality, urban revitalization, suburban structure, access to opportunities, management of highway mobility, and improvements with other modes.

9.11 Iowa 44 Corridor Coordinated Land Use and Transportation Planning



Tom Kane
DMAMPO

www.dmampo.org

Background

By studying corridor 44 and the surrounding area, DMAMPO developed a land use and transportation alternative that would accommodate population growth and transportation infrastructure. Through the study of Des Moines and its sub-regions they were able to determine the need for two separate plans that interact closely with each other – one plan to accommodate the urban population and one for the rural population. DMAMPO headed a comprehensive study that involved a multitude of stakeholder partners, consisting of 26 factions including local and state governments, school districts, businesses, and non-profits.

Overview

The MPO researched past construction and created an inventory current conditions, including pavement and shoulder widths, sufficiency ratings, traffic flows, and origin of destination studies. They then made projections for growth, traffic, and level of services available.

The Iowa 44 Coordinated Land Use and Transportation Plan was developed based on these projections. This plan develops land use goals, inventories existing conditions along the corridor, addresses safety issues, and identifies areas with environmental sensitivity. The plan also develops a strategy to balance current and future land use, identifies needed corridor improvements and areas for development, and promotes a regional perspective while recognizing the needs and development trends of each of the partnership member.

DMAMPO has suggested that the plan’s suggestions be adopted by local governments to create a coordinated right-of-way preservation effort and land use plans and zoning ordinances that capture specific implementation aspects.

Outcomes

In order to carry out these objectives, DMAMPO created a 28E agreement document with Iowa DOT to adopt access management plans that promote a regional perspective. DMAMPO also requested that the Iowa DOT fund and implement a planning study for the Iowa 44 corridor.

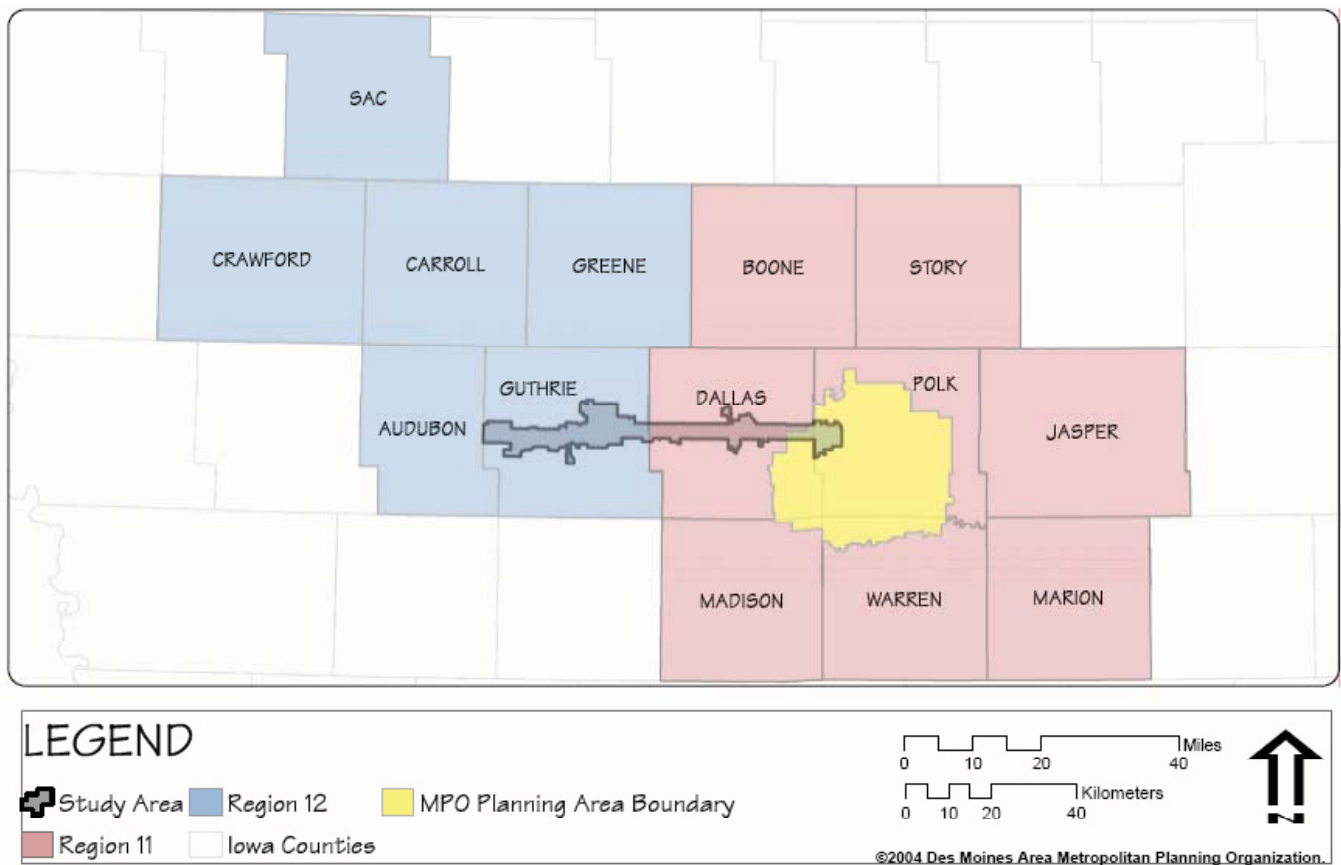


Figure 19. Map of DMAMPO Planning Area and Iowa 44 Corridor Area

9.12 Integrating Land Use and Transportation Planning to Address Air Quality Conformity

Background

The Dover/Kent area is located within the Philadelphia air shed, which creates air quality issues for the surrounding communities. The urban area population of Dover/Kent is approximately 65,000 while the transportation and air quality planning region is about 138,000.



Juanita Wieczorek
Dover/Kent County MPO

www.doverkentmpo.org/indexmpo.html

Overview

Due to limited congestion and the dispersed population, it is challenging to devise effective transportation strategies to reduce emissions in the Dover/Kent region. Traditional measures have a minimal impact on daily VMT.

In 2003, the MPO modified the CorPlan land use model that was originally developed for the Charlottesville-Albemarle County, VA MPO and incorporated the results into its LRTP update. By advocating a more compact, managed development pattern in the region, the MPO anticipated that motor vehicle emissions would be reduced. However, the MPO could not reduce emissions generated by the plan adequately to meet the 2005 Rate of Progress Plan (ROP) budget in the SIP. The shift from the MOBILE5b to MOBILE6 model widened the gap between the plan-generated emissions and the SIP budget.

In July 2004, the Dover/Kent region's conformity lapsed. To continue to receive federal transportation funds,

the MPO stopped its LRTP plan update and CorPlan modeling effort to develop an Interim LRTP and TIP.

Outcomes

Once able to recommence the LRTP update, the MPO worked with a consultant to modify the CorPlan model and develop three growth scenarios. The forecasts clearly demonstrate that the Livable Delaware Scenario, while not preventing all future transportation issues, will experience about one third to one half as many as the Growth Beyond the Growth Area Scenario. The reduced number of problem areas translate into a more affordable LRTP. Additionally, by directing growth into a defined area, modes beyond a single occupant vehicle are more feasible.

The Livable Delaware Initiative (LDI), based on the *Livable Delaware Scenario*, is supported at the state, county and municipal level. It is a major component of the Kent County Comprehensive Plan and coincides with the sending and receiving areas of the County's Transfer of Development Rights Program. By using the CorPlan model to quantify LDI's benefits of in terms of transportation, the MPO validates support for the initiative on the regional level. Because future transportation improvements must relate back to or come from the LRTP, inclusion of the LDI in the plan helps ensure future investments in the growth area.

Evidence of the success of the Kent County Comprehensive Plan and the LDI was provided in the form of a map that showed the vast majority of developments approved in Kent County in the last two years were located in the growth area.

Workshop Ten, June 26, 2005: Climate Change: A Transportation Planning Approach to Reducing Greenhouse Gases

NARC held the tenth in a series of workshops addressing integrating air quality and transportation planning in Monterey, CA, on June 26, 2005. This workshop discussed regional planning, transportation infrastructure and the environment in relation to Global Climate Change (GCC). It presented ways in which COGs and MPOs can educate themselves on GCC and offered examples of how to reduce GHGs on a regional level.

The questions addressed include:

- What are the ecological and environmental impacts of GCC?
- How does GCC relate to transportation?
- What are local, regional, state and federal entities doing to reduce GHG emissions?
- How can COGs and MPOs play a role in addressing GCC?
- How does planning play a role in mitigating GHGs?

Workshop ten presented an in depth discussion on how regions should approach planning for GCC. It emphasized reducing GHG emissions through greater vehicle fuel efficiency, smart growth planning, updated transportation infrastructure, and new technologies.

Workshop Topics and Presenters

- 10.1 Climate Change: Evidence, Causes, Uncertainties, and Role of Transportation
Phillip Duffy, Lawrence Livermore National Laboratory (LLNL), focused on evidence of GCC, its causes, and the projections and uncertainties that exist on this topic.
- 10.2 Transportation and Climate Change
Dan Sperling, Ph.D., University of California-Davis, focused on how transportation relates directly to GCC issues.
- 10.3 Department of Transportation Center for Climate Change and Environmental Forecasting
Diane Turchetta, U.S. DOT, focused on the history, goals, strategies, and initiatives of the Center for Climate Change and Environmental Forecasting (CCCEF).
- 10.4 Reducing Greenhouse Gas Emissions from Transportation
Kathryn Zyla, Pew Center for Climate Change, focused on the connection between GCC and transportation and what is currently being done to mitigate GHGs.
- 10.5 Cities for Climate Protection: Regional Opportunities
Melissa Royael Capria, International Council on Local Environmental Initiatives (ICLEI), described ICLEI's Cities for Climate Protection program.
- 10.6 Global Warming? No, It's Just Good Planning!
Rex Burkholder, Metro, focused on Portland's growth initiatives and how they help the region reduce its emissions.
- 10.7 Climate Change and the New York State Energy Plan
John Zamurs, New York State DOT, focused on New York's efforts that required all MPOs to compose GHG emissions inventories and climate action plans in conjunction with the New York State Energy Plan.

- 10.8 California's Regulations to Control Greenhouse Gas Emissions from Motor Vehicles
Doug Thompson, CARB, focused on California's initiatives to reduce GHG emissions through policy and technology making cars more efficient.
- 10.9 Sacramento's Regional Actions to Reduce Greenhouse Gases
Larry Greene, Sacramento Metropolitan Air Quality Management District (SMAQMD), focused on the SMAQMD's initiatives to create a comprehensive long range land use policy, reducing GHG emissions and increasing the region's quality of life.
- 10.10 Bay Area Air Quality Management District Climate Protection Program
Ina Shlez, Bay Area Air Quality Management District (BAAQMD), discussed why BAAQMD adopted a GCC action plan.

10.1 Climate Change: Evidence, Causes, Uncertainties and Role of Transportation



Philip Duffy
LLNL
www.llnl.gov

Background

According to the Intergovernmental Panel on Climate Change (IPCC), world temperatures have increased 0.6 degrees Celsius in the last century. IPCC explains that not only has atmospheric temperature increased, oceans have also warmed and the density and extent of ice cover in the polar regions has decreased. Warming of the oceans has increased ocean levels, making coastal communities and habitat more vulnerable.

On a global scale, meteorological trends have shown that the planet is undergoing several changes:

- the length of freeze-free season has lengthened in mid and high altitudes;
- land snow cover has decreased 10 percent since 1960; retreat of mountain glaciers have continually occurred in the 20th century;
- 10-15 percent decrease in summer sea ice extent since the 1950s;
- global sea level has risen 0.1 to 0.2 meters since 1900;
- the frequency of extreme low temperatures has decreased since 1950;
- heavy precipitation has become more frequent in mid and high latitudes of the Northern Hemisphere;
- river flow is occurring earlier in some regions; and
- permafrost regions in the Arctic are smaller.

On a regional scale, California has already experienced GCC, with snow cover consistently melting more quickly, leading to heavier river flow earlier in the year and reduced water supply throughout the remainder of the year.

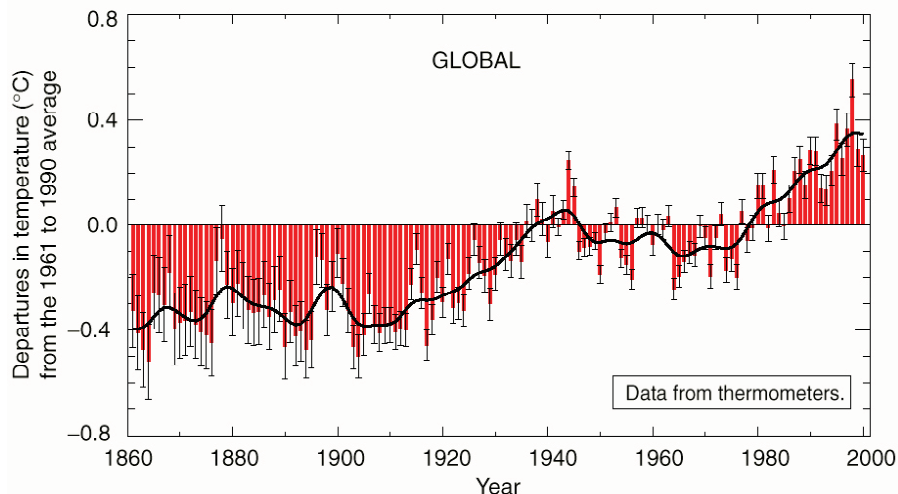


Figure 20. Observed Global Temperature (1860-2000)

Overview

Humans have contributed to these meteorological trends by emitting GHGs into the atmosphere. These gases become trapped in the atmosphere, creating the “greenhouse effect” and thus warming the earth. Earth is now absorbing more energy from space than it is emitting.

Outcomes

In order to understand past and present climate as well as make projections for the future, meteorologists and climatologists use complex computer simulations. GCC projections are inherently uncertain because the pace at which GHGs will build up in the atmosphere is uncertain, depending on future rates of population and economic growth, among other factors. Scientists also do not perfectly understand how the climate will respond to an increase in GHGs and as a result climate models show a large range in the possibilities of warming.

10.2 Transportation and Climate Change

Background

Vehicles emit large amounts of GHG into the atmosphere, through the combustion of fuel, making it very difficult to reduce vehicle GHG emissions to a sustainable level without extreme action due to the use of oil and level of travel, consumption and sprawl. In the U.S. petroleum consumption has risen 66 percent in the last 45 years, with no indication of slowing. Not only has oil consumption gone up, the oil industry has also turned to different types of carbon dense materials, such as tar sands and coal that emit more GHG.



Dan Sperling, Ph.D.
University of California-Davis
www.its.ucdavis.edu

Overview

VMT and congestion have increased for a variety of reasons including increased sprawl and the related decreased viability of transit. Freight has also increased at an alarming rate. The freight community has slowly shifted goods from rail to trucks, which burn more fuel and emit more GHG than trains. Fuel economy of light duty vehicles in America has also decreased despite technologies that make cars and light trucks technically more efficient. Their larger size and greater power typically offset any efficiency improvements. The transportation system is resistant to change and is not sustainable for future generations.

Three options that may help reduce VMT are:

1. Changing behavior by increasing the cost of car travel, controlling sprawl, and adding more choice.
2. Improving conventional technologies by introducing more efficient cars like hybrid electric vehicles.
3. Introducing advanced vehicles and low-carbon fuels.

A combination of all three would be most effective and it is important to create a market in which options are provided that promote efficiency and lessen environmental impacts.

Creating more efficient technologies and low-carbon fuels is an option for reducing energy consumption and GHG emissions. However, many of these fuels have limitations. Cellulosic ethanol can result in near zero carbon emissions, but it is expensive, environmentally unfriendly, and limited in availability. Battery electric vehicles are efficient but expensive and impractical for long distances. Hydrogen has the greatest potential for reducing oil use and GHGs, but is expensive, storage is difficult, and the infrastructure does not exist.

ITS technology can also increase transportation efficiency by creating new travel models, increasing inter-modalism, and reducing vehicle travel to improve access and mobility. Creating an efficient transportation infrastructure is a key component to reducing GHG emissions.

Outcomes

It is critical to develop a customer focused approach to transportation that creates an effective, sustainable system, incorporating the acceptable spectrum of options and choices that every society determines. America values individualism and consumer sovereignty, with a history of open space, abundant resources, large frontier, and remoteness from foreign conflict. Therefore, the fight between our private desire and the public good is the critical issue when reducing of GHG emissions from motor vehicles.

10.3 U.S. DOT Center for Climate Change and Environmental Forecasting



U.S. Department of Transportation

Federal Highway Administration

Background

CCCEF began informally in 1997 as an effort to raise awareness within DOT on the issue of GCC and its affects on the transportation system. The first formal meeting was in 1999 and funding for this project was allocated in FY2000. CCCEF brought together staff from every DOT branch, creating a multimodal core of research professionals. It receives administrative support from the Research and Innovative Technology Administration (RITA) and has a multi-modal Steering Committee to oversee all climate change strategies at DOT.

Diane Turchetta

U.S. DOT

www.climate.volpe.dot.gov

Overview

CCCEF was formed to create leadership on transportation and climate change issues; develop and coordinate a unified voice for DOT; improve DOT's capacity for research, data, and evaluation on strategies to meet mobility needs while contributing to goals or commitments for GHG reduction; and prepare the transportation system to address potential long-range effects of global climate change.

Outcomes

CCCEF is a full partner in the Bush Administration's Climate Change Science Program. It is also involved in ongoing research featured as one of 21 Synthesis and Assessment products in the President's Climate Change Research Initiatives. Internationally, DOT has had representation at many meetings and conferences, including the United Nations Conference of Parties in 2000, 2003, and 2004. DOT was also the lead author for the transportation chapter in the fourth assessment from the IPCC, and will participate in reviewing the report.

CCCEF has also conducted many research initiatives that focus on the effects of transportation and GCC as well as the impacts of climate variability. These research initiatives will:

- create outreach, advocacy and action on the potential impacts of GCC on transport infrastructure and services;
- increase energy efficiency and reduction of GHGs;
- improve transportation GHG data and modeling; and
- institutionalize capacity issues that support the implementation of multimodal and intersectoral efficiency strategies.

Many of DOT's programs also have ancillary climate benefits. For example, the Corporate Average Fuel Economy (CAFE) standard is put in place to reduce energy consumption by increasing the fuel economy of cars and trucks. The CAFE standard saved 2.5 billion gallons of fuel in the latest rulemaking. Additionally, DOT funds programs for congestion mitigation, hydrogen-powered transportation, air quality improvement, idle-reduction, and transit development.

To access information on CCCEF's reports and initiatives, along with general information on GCC and transportation, visit the CCCEF website at: www.dot.gov/climate.

10.4 Reducing Greenhouse Gas Emissions from Transportation



Background

The Pew Center is an independent, non-profit, and non-partisan organization. It is divided into five major program areas including scientific studies/analyses, domestic and international strategies, outreach (business and states), solutions, and communications.

The Pew Center recently released a report entitled *Reducing Greenhouse Gas Emissions from U.S. Transportation* by David L. Greene, Oak Ridge National Laboratory and Andreas Schafer, Massachusetts Institute of Technology.

Kathryn Zyla
Pew Center for Climate Change
www.pewclimate.org

Overview

Reducing Greenhouse Gas Emissions from U.S. Transportation established many ideas to reduce GHG in the U.S., including alternative fuels, vehicle energy efficiency, and system efficiency. The pros and cons of using certain alternative fuels, such as liquefied petroleum, low carbon-to-hydrogen fuels, hydrogen and electric fuels were presented.



Source: U.S. DOE/EIA Annual Energy Review 2000, Table 2.1a.

Figure 21. U.S. Transportation Energy Use (1950-2000)

Vehicle energy efficiency is another way transportation experts can change the system to reduce cars' GHG emissions. Currently, vehicle fuel economy could be increased by 12-17 percent (25-42 percent for light trucks) using technologies that would not change the size, weight, or performance of vehicles. While many of these technologies would increase the price of the vehicle, the cost would be repaid over the life of the vehicle with reduced fuel usage. Another way to achieve vehicle energy efficiency is to reduce the energy that is needed to move the vehicle by altering its weight, aerodynamic drag, or rolling resistance.

System efficiency can also be changed to increase vehicles' energy efficiency. Governments can promote behavioral changes through investments in infrastructure and operations. State and local governments have policy and program tools to create more direct transportation routes, increase vehicle occupancy rates, shift traffic to lower-emission modes, and improve the efficiency of vehicles through maintenance and driving behavior.

Outcomes

This report made many recommends for future implementation, including possibilities for regulation, vehicle efficiency improvements, system efficiency increases and better traffic demand management.

10.5 Cities for Climate Protection: Regional Opportunities



Melissa Royael-Capria
ICLEI
www.iclei.org

Background

ICLEI's mission is to build and support a worldwide movement of local governments to achieve and monitor tangible improvements in global environmental conditions through cumulative local actions.

ICLEI's Cities for Climate Protection Campaign (CCP) was created to achieve measurable reductions in local GHG emissions, improve air quality, and enhance urban livability. Thus far there are over 500 participating municipalities worldwide, 156 of which are from the United States. ICLEI is particularly excited by the recent signing of the U.S. Mayors Climate Protection Agreement, where 160 city mayors pledged to reduce GHG emissions within their jurisdictions.

Overview

CCP has two approaches in dealing with local government GHG emissions reduction. First, ICLEI helps local governments make improvements in operations resulting in increased efficiency. Second, they help participating local governments create and set policies that change their community's habits. For example, CCP participants promote energy efficiency through procurement, improvement of solid waste management, and improvement of transportation systems. Once a municipality is interested in joining the CCP program, they must agree to follow a milestone process, which includes:

- conducting a baseline inventory and forecast of GHG emissions;
- setting a reduction/avoidance goal;
- developing an action plan with implementation measures; and
- monitoring and evaluate these measures.

Outcomes

ICLEI hopes to expand their programs to the multi-jurisdictional level. The Central Connecticut Regional Planning Association (CCRPA) is the first regional council to join the CCP program. CCRPA earned "buy-in" from all seven local governments within its region and passed a resolution establishing their participation in the campaign. ICLEI then placed an intern directly with the CCRPA to complete a global warming emissions inventory for each community in the region, as well for municipal operations of each local government.

Once completed, these emissions inventories helped the region develop initiatives to reduce GHG emissions. CCRPA also found the program unified member towns around one issue and cultivated relationships for the future. CCRPA is now looking for additional funds to implement their action plans.

10.6 Global Warming? No, It's Just Good Planning!



Rex Burkholder
Metro

www.metro-region.org

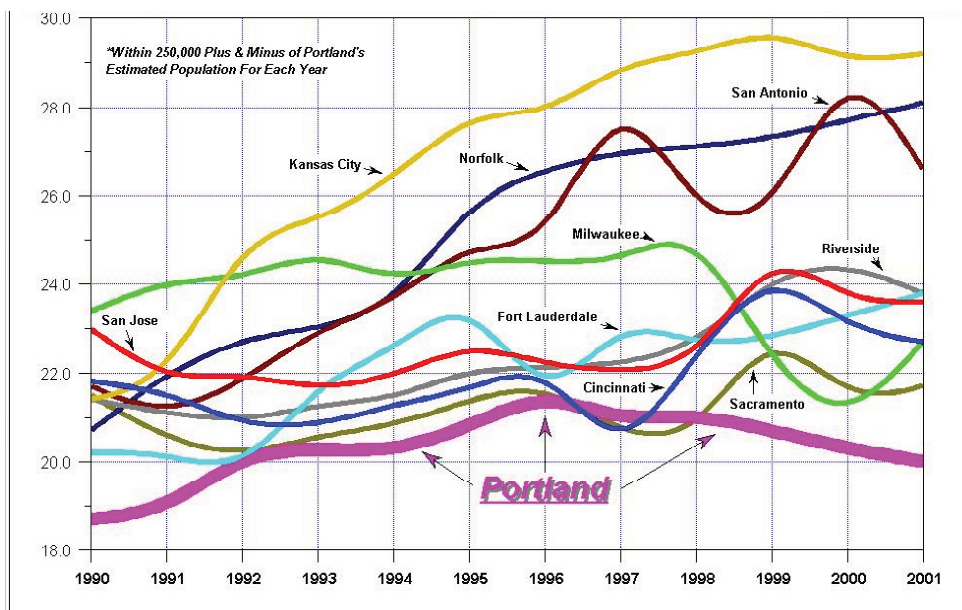
Background

Metro serves as the MPO for 30 cities, 4 counties, 2 states and over 2 million people in the Portland, OR region. To counteract the instability and create a sustainable growth and development pattern, action was taken in the early 1970's to reverse sprawling growth trends. This vision focused on supporting high-density urban living, light rail use and multi-modal projects. In 1977, the development of a transit mall became the new focus for redeveloping the central city, making transit a viable option for travel.

Today, light rail provides 27 percent of weekly day transit trips for the Portland region. Transit ridership has increased at twice the rate of population and a rate 66 percent higher than VMT growth. Two more light rail lines and a commuter rail line are planned in the next five years.

Overview

In order to accommodate future growth while maintaining livability, Metro developed a 50-year plan. They involved the public using questionnaires, meetings, and forums, resulting in long-range a plan with comprehensive, long-term consensus. The 2040 Growth Plan focuses on creating vibrant urban centers with safe and sustainable travel options. All streets will be retrofitted to include sidewalks and bikeways that will make it easier to access to transit. Federal transportation funds programmed by Metro are targeted to achieve regional land use goals through investments in multi-modal projects as well as programs in transportation demand management and transportation oriented development (TOD).



Source: "Highway Statistics", published by the FHWA, 1990-2002, 'Urbanized Areas, Selected Characteristics', Table HM-72. Portland data for 1999 and 2000 was in error due to a report software problem. The corrected figures appear above, as per direct correspondence with Oregon's DOT, Highway Performance Monitoring System office. Note: For data consistency over time, some figures were included that were above or below the 250,000 population range criteria.

Figure 22. Daily VMT in Portland Compared with Cities of Similar Population Size

Outcomes

Through Metro's policies, VMT per capita and therefore GHG emissions have decreased dramatically. In addition, the City of Portland set goals to reduce GHG emissions to 10 percent below 1990 levels by 2010. Due to considerable action and effort the city is 0.1 percent below 1990 levels, despite a 25 percent increase in population. In addition to regional transportation and land use policies, the City of Portland purchases 10 percent renewable energy, and has planted more than 750,000 trees and shrubs and insulated 10,000 housing units.

10.7 Climate Change and the NY State Energy Plan

Background

The NY State Energy Plan, adopted in 2002, has become the blueprint for energy decision-making throughout the state. It provides broad energy policy direction and considers transportation, environment, energy, and economic development.

Overview

The plan gave approximately 65 recommendations for change, 30 of which were directly or indirectly related to transportation. Many of these transportation recommendations also related to GHG emissions reduction. The plan commits the state to a goal of reducing GHG emissions to 10 percent below 1990 levels by 2020. The state also adopts the goal of reducing statewide energy use in 2010 to a level that is 25 percent below 1990 energy use per unit of Gross State Product. In addition, the State will

Department of  ransportation

John Zamurs

New York State DOT

www.nysersda.org/Energy_Information/energy_state_plan.asp

adopt a goal of increasing the share of renewable energy as a percentage of primary energy use up to 50 percent by 2020. The plan recommends working with regional and local planning organizations to analyze and quantify the energy use and air pollution emissions expected to result from transportation plans and programs.

The New York DOT is supervising the effort to consider the energy use and GHG emissions impact of transportation actions. MPOs are assessing and comparing the cumulative energy and GHG impacts of projects listed in their TIPs and LRTPs.

Outcomes

All thirteen MPOs throughout the state are evaluating energy consumption and air pollution emissions. Current results are preliminary and differ depending on whether they are model or project based. The MPO's altogether recorded an 11 percent reduction of GHG using project based initiatives.

The MPO reaction to this effort was both positive and negative. The MPOs urged the state to be a leader in GHG reduction, through a guidance program. This plan has promoted awareness of issues and recognizes the important role of transportation in the process.

10.8 California's Regulations to Control Greenhouse Gas Emissions from Motor Vehicles



Doug Thompson
CARB
www.arb.ca.gov

Background

The Governor and the citizens of California are at the forefront of GCC policy because the state is already experiencing its effects. California residents have supported action to reduce GHG emissions. From 2002-2004, 80 percent of California residents voted in favor of AB 1493, a bill that requires that automobile manufacturers adopt regulations by January 1, 2005 to maximize the most feasible and cost effective way to reduce GHGs from their vehicles. Regulations may not take effect prior to January 1, 2006 and they apply to 2009 and later model years. Regulations must provide maximum flexibility and credit for early action or the development of alternative means of compliance by automakers. Regulations do not require fees or taxes on vehicles, fuel, or VMT; bans on sale of any vehicle category; reduction in vehicle weight; or limitation on or reduction of speed limit.

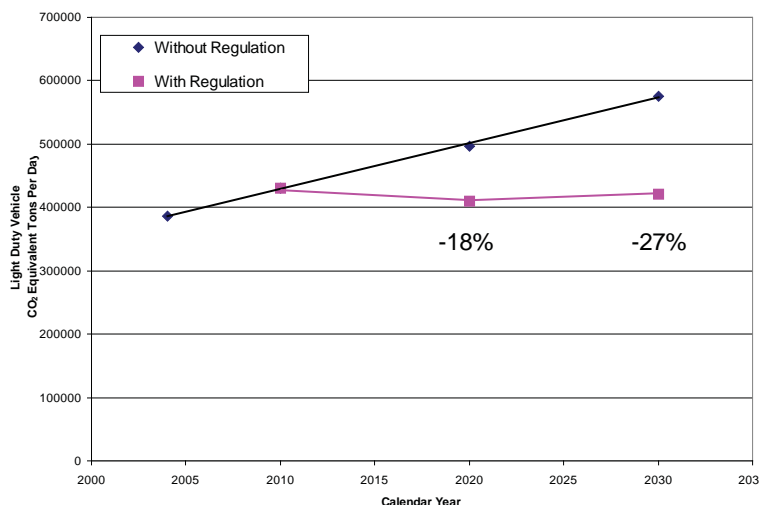


Figure 23. Light Duty Vehicle Carbon Dioxide Emissions with and without Regulation

Overview

There are many components in a vehicle's makeup that contribute to the release of GHG emissions. Therefore, to counteract air pollutant emissions and start the process of meeting AB 1493 regulations, car companies have developed different technologies to reduce emissions. To meet this regulation all car companies must take into account that:

- all GHG emissions apply to this ruling (CO₂, CH₄, N₂O, HFCs);
- all vehicular GHG sources are held accountable (i.e. tailpipe and air conditioner); and
- all emissions are weighed according to "global warming potential".

Standards were set to be feasible for the manufacturer's heaviest fleet, which ensures all manufacturers can comply without altering their fleet mix. Therefore, the regulation is developed in a way that maintains consumer choice.

Outcomes

AB 1493, once in effect, will have many positive affects. Although the new technologies will increase the price of the car, there will be an overall net savings throughout a car's life time. The new technologies are projected to reduce GHG emissions from cars by 27 percent by 2030. This effort will also bring 53,000 new jobs to the state of California by 2020, increase business, and have a positive effect on minority and low income communities.

10.9 Sacramento's Regional Actions to Reduce Greenhouse Gases

Background

The Sacramento region consists of five air districts and six counties, as well as their constituent municipal governments. Throughout the last decade SMAQMD has continuously worked on a number of short- and long-term initiatives to reduce reactive organic gases and nitrogen oxides, indirectly affecting GHG emissions. These efforts have continuously connected the Air District to SACOG, especially in addressing land use initiatives.

Overview

Due to the SIP and its correlation to transportation planning and land use regulations and policies, SMAQMD decided to work directly with SACOG to promote and carry out their regional comprehensive plan, Blueprint 2050. Blueprint 2050 was created as a comprehensive long range plan that provides Sacramento residents with a regional multi-modal transportation system, various housing choices, high density development, use and reuse of existing assets, mixed land use principles, natural resource conservation, and quality design.

The upcoming 8-hour ozone SIP and the 2030 Metropolitan Transportation Plan have common timelines, allowing SMAQD and SACOG to support each other technically and share the cost of project implementation.

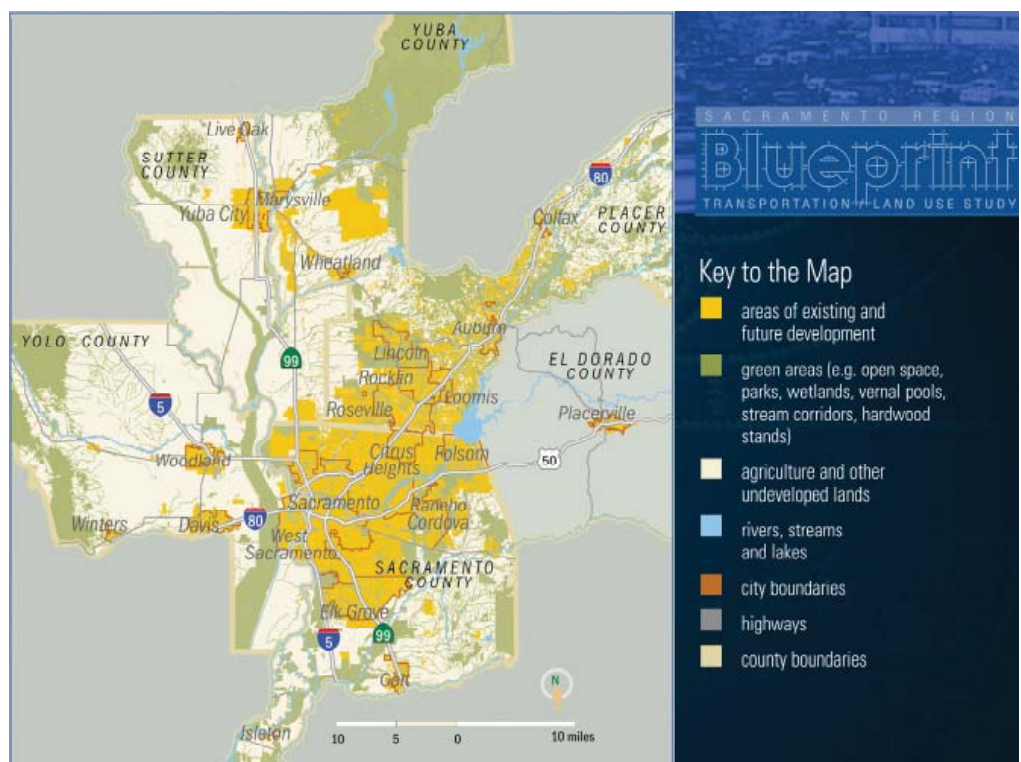


Figure 24. Map of SACOG Blueprint Transportation Land Use Study

Outcomes

Through modeling programs, SACOG created baseline and alternate scenarios for the region projected through 2030. Workshops were held to gather public opinion from each jurisdiction, with a larger regional workshop held later to condense all reactions into one action plan. SACOG received official “buy-in” from all local elected officials in October 2004, which led to the creation of a comprehensive long term policy on regional growth and development.

Twenty-eight local governments signed commitments to implement the plan and a 2030 map creating a specific plan for SIP/MTP project implementation is under development. Counties and cities in the region have already begun to implement specific plans for their community.

10.10 Bay Area Air Quality Management District Climate Protection Program



Background

The San Francisco Bay Area population is projected to increase from seven million in 2000 to 8.8 million by 2030. This increase will affect emissions due to congestion, energy consumption and VMT. Higher temperatures in the region have led to increased emissions, ozone formation and particulate matter. These trends threaten to erode the air quality improvements made in the Bay Area over the past 50 years.

Ina Shlez
BAAQMD

www.baaqmd.gov/pln/climatechange.htm

Forty-one percent of California’s GHG emissions come from its transportation system, as opposed to 27 percent in the rest of the United States. Air pollutants are interrelated and reducing one air pollutant can also reduce other air pollutants. These co-benefit strategies are particularly effective when dealing with mobile sources. Numerous Bay Area Air Quality Management District (BAAQMD) programs are currently working to reduce criteria pollutants and therefore indirectly reduce GHG emissions.

Overview

There are many statewide and local initiatives for reducing GHG emissions. BAAQMD has developed a GCC action plan. The BAAQMD Board of Directors passed a resolution in June, 2005 acknowledging GCC as a problem and formally creating the BAAQMD Climate Protection Program.

The Climate Protection Program goals and initiatives are to:

- Provide regional support and leadership on the issue;
- Collaborate with other regional and State efforts;
- Develop an inventory of GHGs for the region;
- Host forums to coordinate climate protection initiatives;
- Create guidance for new initiatives;
- Provide technical assistance to local stakeholders;
- Public education and outreach campaigns; and
- Work with internal district programs and staff inventorying our own GHG emissions and setting reduction targets.

Outcomes

BAAQMD plans to involve local stakeholders in development of the Climate Protection Program. They will also roll out emissions inventory data for the region and assess the biggest sources of pollution.

Workshop Eleven, June 20, 2006: 8-Hour Ozone and Fine Particulate Matter: New Standards, New Challenges, New Strategies

NARC held the 11th in a series of workshops on integrating air quality and transportation planning in San Antonio, Texas, on June 20, 2006. This workshop provided participants with information on EPA's planned regulation for implementing the 8-hour ozone and PM2.5 NAAQS.

A final rule on PM2.5 regulation was required by September 27, 2006, per a court issued consent agreement. Implementation of revised regulations for PM2.5 and the 8-hour ozone NAAQS presents challenges to local governments as they seek to balance regional growth with the need to improve air quality. To help meet these challenges, this workshop features three panels addressing a variety of topics related to the regulatory framework and processes, state and local challenges for developing emission reduction programs, and local successes in adapting to these challenges.

This workshop was moderated by:

Kathy Daniel, U.S. DOT FHWA

Mark Simons, U.S. EPA

The questions addressed include:

- What are the new PM2.5 and 8-hour ozone NAAQS?
- What challenges to states and regions face in meeting the new standards?
- Which strategies and programs have proven effective in reaching attainment to date?

Workshop 11 emphasized that meeting new air quality standards may require rethinking traditional control measures and reaching out to additional stakeholders. Each speaker stressed the importance of regional coordination in meeting the PM2.5 and 8-hour NAAQS. While local control measures continue to play an important role, regional growth and activity outside of the nonattainment areas could be critical in some cases.

Workshop Topics and Presenters

- 11.1 Implementation Program for the Fine Particle National Ambient Air Quality Standards
Larry Wallace, Ph.D., U.S. EPA Office of Air Quality Planning and Standards, focused on the PM2.5 NAAQS and upcoming deadlines.
- 11.2 8-Hour Ozone National Ambient Air Quality Standard - Update
Tom Diggs, U.S. EPA Region 6, focused on the 8-hour ozone NAAQS and upcoming deadlines.
- 11.3 Regional Challenges in Attaining New Ozone Standard
Bill Gill, Capital Area Council of Governments (CAPCOG), discussed CAPCOG's challenges in and strategies for improving the region's air quality.
- 11.4 Integrating Air Quality and Transportation Planning in Texas
Gregg Cooke, Guida, Slavich & Flores P.C., Former Administrator for U.S. EPA Region 6, focused on the challenges regions face while transitioning from the 1-hour to the 8-hour ozone NAAQS.

- 11.5 Texas Challenges in Meeting the 8-Hour Ozone Standard
Kelly Keel, State Texas Commission on Environmental Quality SIP Team Leader, focused on the challenges Texas faces in identifying new strategies for meeting the 8-hour ozone NAAQS.
- 11.6 Reducing Vehicle Emissions in the Houston-Galveston Region
Pat Waskowiak, H-GAC, discussed the programs H-GAC is using to improve air quality and reach attainment by 2009.
- 11.7 Local Implementation Success Stories: 8-Hour Ozone and Transport/State Air Permits
Peter Bella, Alamo Area Council of Governments (AACOG), discussed AACOG's successful outreach and negotiation efforts to improve regional air quality.
- 11.8 National Clean Diesel Campaign: Projects, Programs and Funding
Monica Beard-Raymond, U.S. EPA Office of Transportation and Air Quality, National Clean Diesel Campaign, discussed the Campaign efforts for education and the value of diesel retrofit technologies.

11.1 Implementation Program for the Fine Particle National Ambient Air Quality Standards



Larry Wallace, Ph.D.

U.S. EPA Office of Air Quality Planning and Standards

www.epa.gov

Background

Particulate matter is a complex mixture of extremely small particles and liquid droplets that can be breathed deeply into the lungs. Consequently, particulate matter can cause negative health effects, including decreased lung capacity, exacerbation of preexisting heart problems, increased hospital admissions, doctor and emergency room visits, increased use of medication, and school absences, and is also possibly linked to higher death rates, lung cancer rates, and low birth weights. Wood-burning stoves, power plants, heavy duty diesel engines, natural sources, cars and trucks, non-road vehicles, forest fires, and industrial sources all emit PM2.5.

Overview

There are 36 areas that have been designated as nonattainment for PM2.5. Areas that cannot demonstrate attainment by 2010 can receive extensions until 2015 and may be extended only once. Areas not in attainment by 2015 will have to revise their SIP for the nonattainment area and show that they will undertake other measures to achieve compliance within the following 5 years.

State attainment demonstrations and SIP revisions are due in April 2008. Attainment demonstrations need to provide the supporting analysis for State adoption of measures that will result in the area attaining the standards as expeditiously as practicable.

Sulfur Dioxide (SO₂) and NO_x must be addressed as PM2.5 precursors. VOC and ammonia do not need to be addressed unless the U.S. EPA or State provides a demonstration that VOC or ammonia is a significant contributor to PM2.5 in the area.

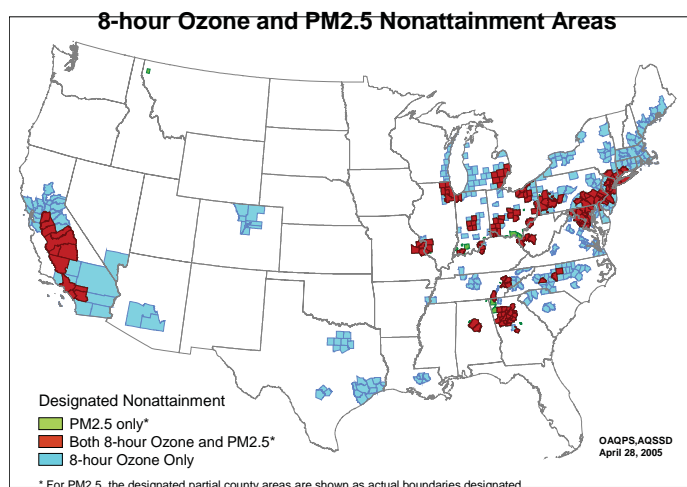


Figure 25. 8-hour Ozone and PM2.5 Nonattainment Areas (2005)

Outcomes

Mr. Wallace acknowledged the short planning timeframe, but noted that the EPA is working very hard to complete the PM2.5 rule by the deadline.

11.2 8-Hour Ozone National Ambient Air Quality Standard - Update

Background

The schedule for reaching attainment for the 8-hour NAAQS is as follows:

- April, 2004 – EPA issued final designations; Final Phase I Implementation Rule
- June 15, 2004 – Effective date of designations
- November, 2005 – Final Phase 2 Implementation Rule
- 2007 – 2024 – Range of attainment dates.

There are already a number of visible improvements with respect to areas in nonattainment for the 8-hour ozone NAAQS. Seventy-five of the 126 nonattainment areas are measuring clean data at their air quality monitors and are in a good position to demonstrate attainment.

Overview

Areas still seeking attainment face many challenges. First, attainment deadlines are short for areas in moderate nonattainment, with plans required to show attainment by 2009. Next, the benefits from nationally implemented Federal Mobile Source Reduction are not yet fully achieved. Finally, there are difficult choices to make for areas that may be “bumped-up” to a more serious nonattainment classification. Areas that are placed in more stringent classifications receive more time to attain the standards, but they must implement additional mandatory control measures in doing so.

Outcomes

As a result of these challenges, a number of areas have elected to engage in an EAC for 8-hour ozone NAAQS, agreeing to implement control strategies in advance of a nonattainment designation in return for a later effective date. There are EACs in place for 29 areas in nine states, with 14 EACs in violation as of June, 2004. The first extension of EAC deferrals was through September 2005 and the second extension was through December, 2006.

11.3 Regional Challenges in Attaining New Ozone Standard

Background

The City of Austin faces a number of unique challenges in meeting the new 8-hour ozone standard. First, most ozone is transported into the area. Almost 70 percent is transported from other areas on designated “high ozone days”. Next, area monitors have measured ozone just slightly above and in some years below the standard. Finally, the Austin region has experienced a significant population growth in recent years. These three challenges mean that there have been several shifts and adjustments made to the strategy for reaching and maintaining the new 8-hour standard.



Tom Diggs
U.S. EPA Region 6
www.epa.gov

Bill Gill
CAPCOG
www.capcog.org



Overview

There have been a number of ways the Austin region has faced these challenges. These techniques can be useful for other areas facing their own challenges to meeting the new standard:

- Start to look at what you can do locally to mitigate the effects of ozone transport from other areas.
- Create an air quality planning flow chart to help in going through the process in a very organized way. If the process is well-defined, it will be easier to get buy-in from others.
- Good science does not come cheap, but is necessary to get the support you need, particularly when looking for funding sources. Photochemical modeling can be costly, so use existing data when possible.
- Look for partners whenever possible (EPA, State, other local areas, etc.).

Outcomes

The steps CAPCOG used to achieve political buy-in on the strategic proposal, which is essential for success, can be replicated by other regions.

11.4 Integrating Air Quality and Transportation Planning in Texas

GUIDA, SLAVICH & FLORES, P.C.

Gregg Cooke
Guida, Slavich & Flores P.C.
Former Administrator for U.S.
EPA Region 6
www.epa.gov

Background

Ozone travels from its emission sources, making controlling emissions and meeting standards a regional issue.

Overview

The transition from the 1-hour to the 8-hour ozone standards poses a number of challenges. In order to meet the new standards, evaluation of the 8-hour standards impact on regions as well as coordination in developing strategies is essential.

Outcomes

Regions' efforts to analyze regional impacts and coordinate attainment strategies will be paramount in meeting the new 8-hour standards.

11.5 Texas Challenges in Meeting the 8-Hour Ozone Standard

Kelly Keel
SIP Team Leader
Texas Commission on
Environmental Quality
www.epa.gov



Background

Texas faces several challenges in meeting the 8-hour ozone standard in Houston and Dallas, both classified as moderate nonattainment areas. Considering Phase II of the 8-hour standards was finalized in November 2005, it is proving difficult for regions to meet EPA prescribed deadlines, including the June 15, 2007 SIP submittal date. The compliance date for control strategies is also fewer than 22 months from June 2007 to pre-ozone season 2009.

Overview

The timeframe for implementing Phase II of the new 8-hour standard is aggressive and difficult to meet in many situations. Substantial emission reductions will be needed in the Dallas-Fort Worth and Houston regions in order to achieve attainment of the 8-hour standard. The state is limited in its authority to regulate mobile sources and must rely on fleet turnover from federally preempted sources.

Outcomes

Texas faces many challenges in meeting the new 8-hour standard. As Texas has already adopted a number of innovative control strategies under the 1-hour ozone standard, there are few remaining untapped feasible control measures available for meeting the new standard.

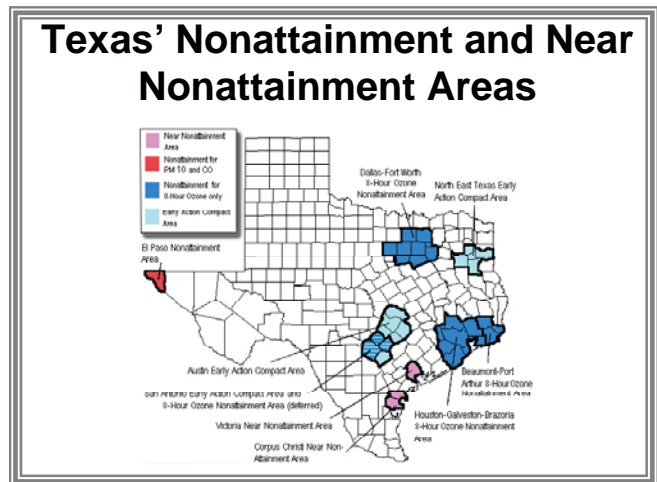


Figure 26. Nonattainment and Near Nonattainment Areas in Texas

11.6 Reducing Vehicle Emissions in the Houston-Galveston Region



Background

HGAC has implemented many programs and strategies to reduce vehicle emissions in the region. The area must reduce NOx emissions by 60 to 65 percent by 2009 to reach attainment for the 8-hour standard.

Pat Waskowiak
HGAC
www.h-gac.org

Overview

Among H-GAC's programs are the VanPool and MiniPool programs. NuRide is another program started last year that has proven successful to date. The NuRide program provides its users with a "ridesharing partner" through access to a database that matches riders up with one another with no commitment. As of May, 2006 the NuRide program had a total of 4,325 participants up and has reduced approximately two tons of NOx.

The Clean Cities/Clean Vehicles Program has been another success for the Houston-Galveston region. This program promotes cleaner fleets by replacing engines or an entire fleet with federal funding. The program has provided over 100 fleets approved for participation, over 1,000 cleaner burning engines and more than 900 tons in annual NOx reductions.

Outcomes

HGAC has developed several programs, many voluntary and involving the general population, in its effort to reduce emissions and reach attainment of the 8-hour standard in 2009.

11.7 Local Implementation Success Stories: 8-Hour Ozone and Transport/State Air Permits Region



Background

AACOG plans to reduce NOx emissions while simultaneously addressing industrial

Peter Bella
AACOG
www.aacog.org

growth in the region and state-wide. As ozone can travel away from its emission source, new State air permit applications have been submitted representing the cement, power production, and petroleum refining industries. Emissions from these new industries, combined with general population growth, are a challenge for the Alamo region.

Overview

One of AACOG's success stories in addressing new point source emissions is with its agreement with TXI Hunter Cement Plant. Through negotiations, TXI agreed to reduce its total NOx emissions from about 7.5 to 5.6 tons per day. These projected reductions are attributed to TXI using Selective Non-Catalytic Reduction for dry process cement kilns. In addition to its focus on "mindful growth", AACOG has furthered its work toward the 8-hour ozone standard by Alamo Clean Air Partnership, Clean Cities, and Commute Solutions programs.

Outcomes

AACOG has utilized several strategies, including negotiations with local businesses, developing partnerships and citizen involvement, to address the new 8-hour ozone standard.

11.8 PM2.5 Conformity and the San Joaquin Valley

Cari Anderson
San Joaquin Valley Air Quality
www.sjcog.org



Background

The San Joaquin Valley in California has been designated as a nonattainment area for PM2.5. This nonattainment area encompasses a total of eight MPOs spread across eight counties, making coordination the primary challenge in working toward attainment.

Overview

To address the challenge of coordination, a valley-wide committee consisting of the members of the eight MPOs and staff from the State Department of Transportation, State Air Agency, EPA, FHWA, and Federal Transit Administration was created. The committee meets monthly by conference call, whereby each individual gives a status report, obtains input, and receives feedback.

Outcomes

Addressing coordination as a challenge in meeting PM2.5 NAAQS is essential in moving from nonattainment into attainment.

Alamo Clean Air Partnership (ACAP)

What types of assistance can my company receive from the Alamo Area Council of Governments to help implement an emissions reduction program?

- ACAP toolkit and website
- Clean Cities Program
- Commute Solutions Program
- Identification of possible funding assistance for implementing emission reduction measures, such as grants, loans, and tax incentives
















Figure 27. Alamo Clean Air Partnership Resources

11.9 National Clean Diesel Campaign: Projects, Programs and Funding



Background

The National Clean Diesel Campaign uses a two-pronged approach to addressing diesel emissions. The regulatory approach involves cleaner fuels and increased engine emissions standards for new engines. The voluntary approach reduces emissions in the existing fleet through a variety of cost effective technologies and strategies.

Monica Beard-Raymond
U.S. EPA Office of Transportation
and Air Quality
National Clean Diesel Campaign
www.aacog.org

Overview

A key component of the National Clean Diesel Campaign is the use of cost-effective innovative diesel retrofit technologies. Examples of diesel retrofit technology include use of a catalyst or filter, engine upgrade, early engine replacement, idle reduction and use of cleaner fuels or additives. EPA verifies the performance of advanced emissions control technologies emission reduction performance, durability and applicability. Technologies verified through EPA or the CARB provides customers with confidence that verified technologies will provide emission reductions as advertised.

Outcomes

Both aspects of the National Clean Diesel Campaign have proven effective. The voluntary programs are successfully reducing diesel emissions in more than 200,000 diesel engines through a sector-based strategy aimed at the school bus, freight, construction, ports and agriculture sectors. Current clean diesel retrofit programs across the country will provide approximately \$5 billion in health benefits from PM reductions over the life of the programs. The regulatory side has also proven successful. By 2030, PM_{2.5} will be reduced by approximately 250,000 tons per year and NO_x by about four million tons per year as a direct result of the National Clean Diesel Campaign. Additionally, benefits are expected to exceed \$150 billion versus costs of approximately \$7 billion.

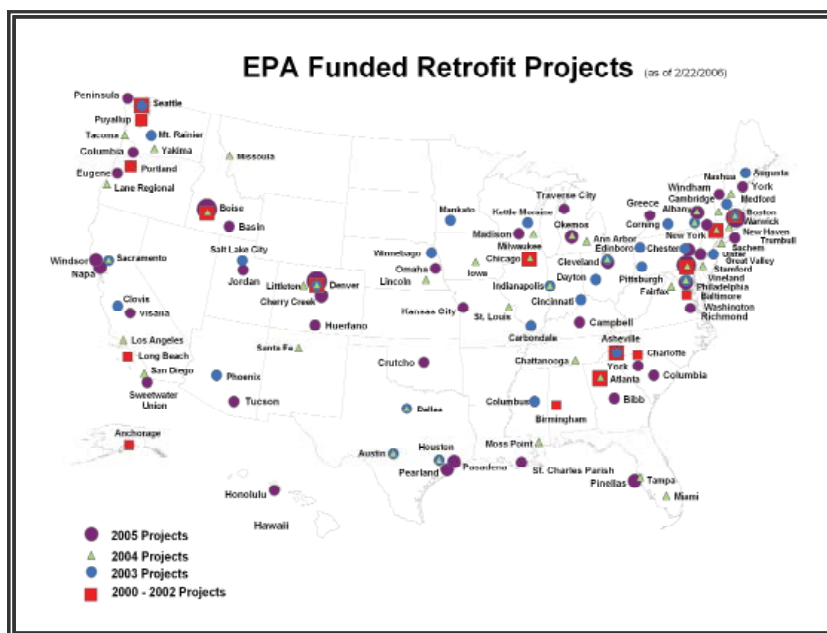


Figure 28. Map of EPA Funded Retrofit Projects (2006)

Workshop Twelve, June 26, 2007: Integrating Air Quality and Transportation Planning in Technology Options and Emissions and Reductions

The NARC held the 12th in a series of workshops addressing integrating air quality and transportation planning in Orlando, FL, on June 26, 2007. This workshop provided participants with information on new technologies and tools available to assist regions and local governments to reduce emissions. Speakers highlighted diesel and other alternative technologies, as well as funding opportunities for programs that implement these technologies at the state and local level.

This workshop was moderated by:
Kathy Daniel, U.S. DOT FHWA

The questions addressed include:

- What are fuel alternatives to petroleum?
- How do alternative fuels and technologies impact air quality?
- What actions are currently being taken and what funding is available to use alternative fuels or technologies?
- How can a COG or MPO become involved in promoting these alternate technologies or fuels?

Workshop 12 focused on alternative fuels and technologies, including diesel, bio-diesel, hydrogen fuel cells and natural gas. Speakers highlighted the impacts that several test projects have had or are predicted to have on regional air quality, including many diesel retrofit programs. Overall, the presentations identified new technologies, alternative fuels, innovative programs and funding opportunities that are available or may soon be available as tools for COGs and MPOs to promote improved air quality.

Workshop Topics and Presenters

- 12.1 Air Quality – Transportation – Costs
David C. Lynch, Ph.D., Cummins Westport, Inc., discussed the use of natural gas and eventually hydrogen as alternatives to diesel engines.
- 12.2 Clean Diesel and Hybrid
Colin Casey, International Truck and Engine Corporation, focused on technology options and emissions reductions.
- 12.3 The Hydrogen Highway
Lisa Kelley, Florida Department of Environmental Protection, discussed Florida's statewide energy plan that promotes fuel conservation and efficiency.
- 12.4 Cummins Emission Solutions
Terence J. Raup, Cummins Emission Solutions (CES), focused on technologies and tools for reducing vehicular emissions, particularly for diesel engines.
- 12.5 North Central Texas Clean Vehicle Programs
Chris Klaus, NCTCOG, discussed NCTCOG's work on air quality planning and operations.

- 12.6 Integrating Air Quality and Transportation Planning: The Association of Central Oklahoma Governments
Zach D. Taylor, Association of Central Oklahoma Governments (ACOG), focused on ACOG's early and voluntary work to maintain the region's air quality and remain in attainment.
- 12.7 Local Emission Reductions from Existing Vehicles and Equipment in Memphis and Shelby County
Ronné Adkins, Memphis-Shelby MPO, discussed strategies the MPO and its many partners use to reduce emissions from existing vehicles.
- 12.8 U.S. DOT's Perspective
Mike Roberts, FHWA, discussed the federal funding available for air quality control and improvement activities through the CMAQ program.
- 12.9 Federal and State Funding
Dawn Fenton, Diesel Technology Forum, focused on programs available through state and federal governments for programs that fund new technologies that limit diesel emissions.

12.1 Air Quality – Transportation – Costs



Background

Cummins Westport, Inc. provides high-performance alternative fuel engines. The company is based in Vancouver and has over 20,000 engines currently in service across the world. Cummins Westport engines meet or exceed the strictest U.S. EPA, CARB and European emissions standards.

David C. Lynch
Cummins Westport, Inc.
www.cumminswestport.com

Overview

The ISL G natural gas engine is the cleanest gas engine currently available, meeting the 2010 EPA and CARB emissions standards. It uses a domestic, renewable fuel source and is the “pathway to hydrogen”. The ISL G engine also uses Cummins Cooled Exhaust Gas Recirculation, which replaces the excess air needed in the older Lean Burn engines, keeping the combustion temperatures low while allowing stoichiometric combustion. As a result, the ISL G engine emits an oxygen-free exhaust, using a three-way catalyst work to reduce emissions.

While the price of natural gas has traditionally fluctuated with petroleum, natural gas prices remain lower than petroleum. Prices are expected to increase with the introduction of the next highway and energy bill; however, Mr. Lynch argued that natural gas engines will be a better choice in the long run, as diesel gas prices are less predictable. Despite the argument for natural gas engines based on fuel costs, they are not appropriate for all users. Natural gas engines are best suited for high volume fuel-users, such as bus fleets.

Outcomes

Cummins Westport focuses on the 3 E's – emissions, economics, and energy security – and as of 2007, the ISL G natural gas engine will meet all three goals by meeting the 2010 emissions standards, as well as using an affordable, efficient and reliable fuel source that is available within the U.S. Additionally gas engines provide a pathway to the hydrogen future, as the fuelling infrastructure and operating environment for natural gas provide the knowledge and experience for a transition to hydrogen use.

12.2 Clean Diesel and Hybrid



Background

Since 1994, diesel engine manufacturers have been improving emissions technology to meet U.S. EPA Standards.

Colin Casey

Overview

Meeting the 2010 EPA emissions standards will require a combination of solutions:

International Truck and Engine Corporation

www.internationaldelivers.com

- **engine technology** that reduces the emissions out of the engine;
- **after treatment technologies** that filter or treat the emissions after they come out of the engine; and,
- **fuel and oil technologies** which burn more cleanly in the engine.

A key part of improving emissions technology was the diesel particulate filter (DPF), which captured carbon that was released from the engine and regenerated it into carbon dioxide. Diesel Hybrid Technology, which uses an electric motor, electronics and battery is another growing technology used to reduce emissions. It captures and recycles motion energy, allowing electrical energy storage to re-use energy in increasingly efficient ways.

The Diesel Technology Forum has been working with governments and industry to develop and use Clean Diesel technology that will improve air quality. In doing so several manufacturers have developed kits to retrofit existing trucks and buses, such as the 2007 Emissions Engine that re-powers or replaces higher emissions engines.

Outcomes

Diesel hybrid technology is not only reducing emissions but also improving fuel economy; the International Truck and Engine Corporation looks forward to working with local governments and industry to help make Clean Diesel and Diesel Hybrid technology available through refuel, retrofit, re-power and replacement programs.

12.3 The Hydrogen Highway



Background

The State of Florida has developed a new, statewide energy plan that focuses on steering the State away from fuel dependency and towards increased fuel conservation and efficiency. The State currently has a growing population and ranks third in overall energy use, producing just over one percent of the fuel it consumes.

Lisa Kelley

Florida DEP

www.dep.state.fl.us

Overview

The *Florida 2006 Energy Plan* is built on the principles of fuel conservation and efficiency. One of the innovative components and a focus for the state is on hydrogen fuel cell technology. The Florida DEP is working with a variety of industry partners that will supply technology and host a hydrogen station.

There is currently a Hydrogen FCV Demonstration Program with a site in Orlando, FL. Five cars with a fuel economy comparable to 40 miles per gallon were delivered in September 2005. Through this program customers will evaluate vehicles based on their use in real world conditions over three years. To date, the cars have shown good performance and reliability; however, refueling and towing the car is inconvenient, and high costs and poor cold weather operation make it impractical.

Outcomes

Although several projects with hydrogen fuel cell technology are ongoing, including shuttle buses in Orange County, FL and several hydrogen energy stations, to date there are several steps needed to make hydrogen cell vehicles a reality. These include lower costs for fuel cells, an increase in traveling range, the development of hydrogen infrastructure and the creation of an affordable and clean source of hydrogen.

12.4 Cummins Emission Solutions

Background

A diesel retrofit involves replacing a vehicle's muffler with a device reducing the amount of soot, NOx, CO and hydrocarbons released with the vehicle's exhaust. CES provides catalytic exhaust products.



Terence J. Raup
CES

Overview

CES promotes using the 5 Rs – re-power, rebuild, replace, refuel and retrofit – as tools to decrease emissions. He highlighted several methods for emissions reducing including engine design alterations, exhaust after-treatment, and alternative fuels. Exhaust after-treatment options include passive devices and active devices for controlling particulate matter emissions.

www.cumminsemissionsolutions.com

CES offers several products for addressing all three methods of emissions reductions. They also provide a matrix and series of questions to assist fleet owners in identifying the appropriate technologies and tools for emissions reductions based on the type of vehicle, vehicle age and current emissions.

Outcomes

There is a wide variety of technology available to reduce vehicular emissions. Educating COGs, MPOs, local governments and other fleet owners is essential in identifying appropriate and cost effective technologies to achieve their emissions reductions goals.

12.5 North Central Texas Clean Vehicle Programs



Chris Klaus
NCTCOG

Background

NCTCOG serves a 16-county region in North Central Texas, which includes the Dallas and Fort Worth urban centers. The Dallas-Forth Worth region is currently in nonattainment and has a variety of existing and planned programs to improve the region's air quality. To address air quality, NCTCOG allocates its funding into four areas: public activity, regulated activity, construction and goods movement fleets.

www.nctcog.org

Overview

The State of Texas provided over \$128 million in funding for the Texas Emissions Reduction Plan (TERP) programs between 2002 and 2007, resulting in a reduction of over 34,000 tons of NOx. Through TERP, NCTCOG plans to develop a Clean Fleet Vehicle Policy, a Clean Vehicle Technology Project and a Smart Way Upgrade Kit Demonstration. These programs will target fuel savings, truck idle-reduction and emissions control.

NCTCOG is also currently working on a Clean School Bus Program, the Diesel Vehicle Idling Reduction Program and the Regulated Fleet Program.

Outcomes

Currently, there are several statewide efforts to improve air quality that NCTCOG supports, including Texas Senate Bill 12, which will provide a Texas-based testing facility, evaluate retrofits, advance fuel technologies and work towards additional NOx reductions.

12.6 Integrating Air Quality and Transportation Planning: The Association of Central Oklahoma Governments

Background

Although the central Oklahoma region is currently in attainment, ACOG promotes and participates in several projects and programs to preserve the region's air quality. The region is motivated to stay in attainment because a nonattainment designation would cause difficulties for industry and small businesses, as well as because ACOG recognizes the importance good air quality has for economic development, regional growth and the general population's health.



Zach D. Taylor
ACOG
www.acogok.org

Overview

ACOG runs an 8-hour Ozone Flex Program to support and reward innovative, voluntary, and local strategies to improve and maintain regional air quality. As a part of this program, Oklahoma City purchases wind power, has vehicles using bio-diesel and CNG fuel, promoted employee awareness and reduced-mowing campaigns, and established specific staff for energy issues. Several local governments, businesses and academic institutions have also agreed to participate in the ENERGY STAR Challenge program.

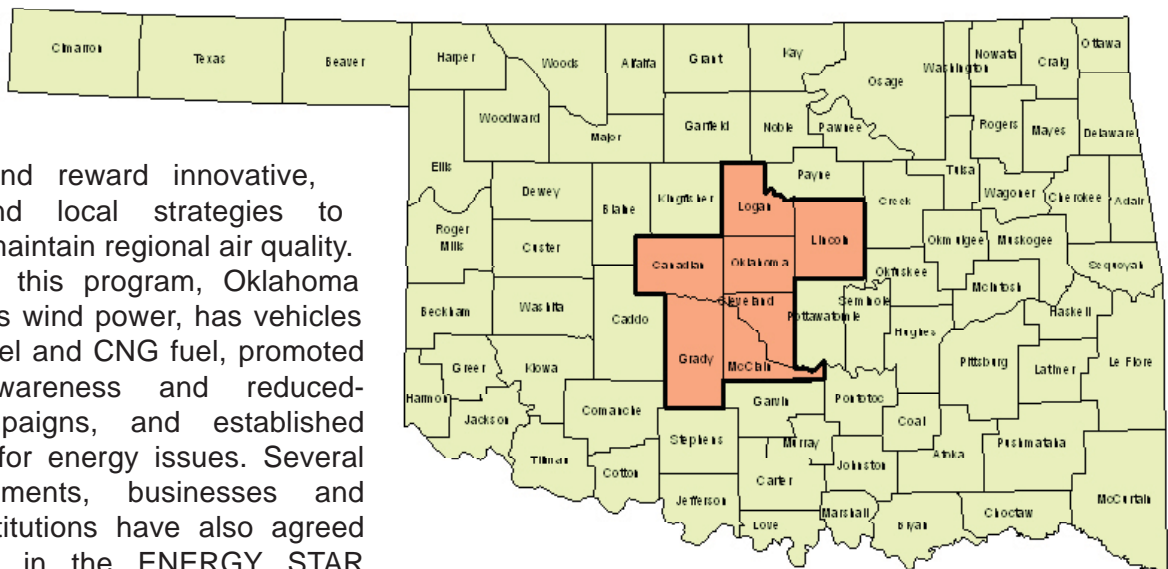


Figure 29. Map of Oklahoma Highlighting ACOG Region

Corporations operating in ACOG's region, including UPS, Coca-Cola, Xerox and OGE Energy Corporation, as well as several state agencies have also pledged various activities and reductions in emissions to keep the region's air quality attainment.

Outcomes

ACOG has begun making contingency plans for actions to be taken should the region be re-classified as nonattainment; however, the focus remains on voluntary actions that can be taken in order to keep the region in attainment.

12.7 Local Emission Reductions from Existing Vehicles and Equipment in Memphis and Shelby County



Background

Shelby County and the City of Memphis, TN have made a comprehensive effort to reduce on and off road emissions through several MPO-led initiatives, including identifying transportation alternatives, improving traffic flow and using cleaner fuels.

Overview

The MPO has focused on reducing emissions from existing vehicles and equipment operating in Memphis and Shelby County. Building partnerships with MPOs and state and local governments across Tennessee, Mississippi and Arkansas, as well as working with the West Tennessee Clean Cities Coalition and the Mid-South Clean Air Coalition has been an important part of this process.

The MPO has developed and supported a variety of actions to reduce emissions, such as:

- reducing speed limits;
- enacting burning bans on Ozone Action Days;
- reviewing local rules;
- running the Memphis Area Rideshare Program (funded through CMAQ);
- promoting idle-reduction programs for school buses (e.g. EPA Clean School Bus USA);
- promoting the use of bio-diesel fuel and diesel retrofits; and,
- developing public education and outreach efforts.

Outcomes

The MPO's future plans include constructing additional bicycle and pedestrian lanes, shifting the county fleet to 100 percent bio-diesel, and using CMAQ funds for additional diesel retrofits and more public outreach and education.

12.8 U.S. DOT's Perspective

Background

CMAQ is a joint FHWA-FTA program that will provide over \$8.6 billion in funding to State DOTs, MPOs and transit agencies for projects that reduce criteria air pollutants from transportation-related sources between 2005 and 2009. Funding is available for nonattainment areas and former nonattainment areas that are currently in compliance, also known as maintenance areas. Funding is distributed by formula, considering an area's population and the severity of its ozone and carbon monoxide issues.



U.S. Department of Transportation
Federal Highway Administration

*Kathy Daniel, on behalf of
Mike Roberts*
FHWA

www.fhwa.dot.gov

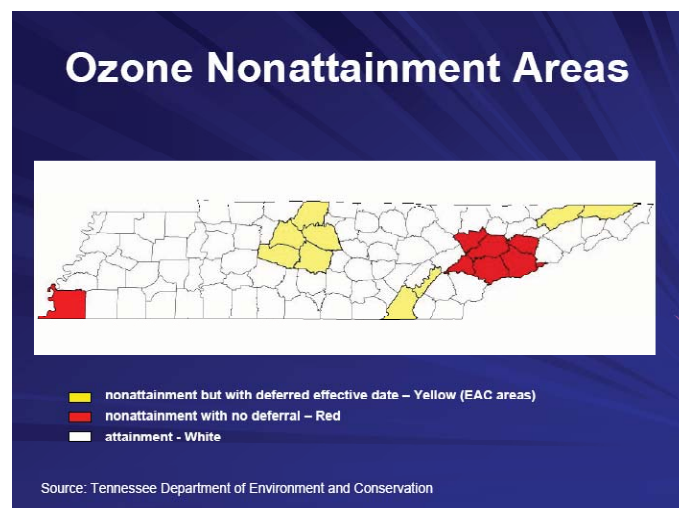


Figure 30. Map of Ozone Nonattainment Areas in Tennessee

Overview

Once funding is allocated by state, additional requirements exist on spending CMAQ funding. Capital assistance allocates funding to establish new or expanded transportation projects and infrastructure. Operating assistance provides funds for new services that provide an area with air quality benefits. Funds are also available for planning and project development. The final project selection process varies from state to state. carbon monoxide issues.

Outcomes

CMAQ has funded over 16,000 transportation projects since 1992, with the majority of the projects improving transit services and traffic flow.

Additional resources could be found at: <http://www.fhwa.dot.gov/environment/cmaqpgs/index.htm>.

12.9 Federal and State Funding

Background

The Diesel Technology Forum is group of energy companies, engine and vehicle manufacturers and emission treatment companies working to increase awareness regarding clean diesel technologies, including the Diesel Oxidation Catalyst (DOC) and the Diesel Particulate Filter (DPF). They accomplish these goals by developing educational materials and holding outreach events.



Dawn Fenton
Diesel Technology Forum
www.dieselforum.org

Overview

The Diesel Technology Forum promotes the 5 R's – retrofit, refuel, rebuild, re-power and replace. They promote diesel retrofits, as a cost effective emissions reduction strategy. The Forum supports the Diesel Emissions Reduction Act (DERA), a voluntary national and state-level grant and loan program to reduce emissions from existing diesel engines through clean diesel retrofits. Several states, including California, Texas, North Carolina, Tennessee and New York, are showing interest in developing statewide diesel retrofit programs due to growing air quality concerns and a lack of federal funding.

Outcomes

Modernizing and upgrading diesel engines has been given a new priority as a cost effective method of improving air quality. Identifying adequate funding remains an issue, however funding availability has been increasing.

Workshop Thirteen, February 4, 2008: Understanding National Climate Change Strategies and Policy Implications for Regional Councils and MPOs

NARC held the 13th in a series of workshops on integrating air quality and transportation planning in Washington, DC, on February 4, 2008. This workshop provided national responses to the impacts of GCC and provided insight into possible effects integrating GHG into transportation planning. The workshop included multiple approaches reducing harmful emissions, including climate change planning, cap-and-trade programs, emissions taxes and CAFE standards. The workshop also emphasized how and why COGs and MPOs will need to understand climate change and its potential impacts.

This workshop was moderated by:
Kathy Daniel, U.S. DOT FHWA

The questions addressed include:

- What actions has Congress taken regarding GCC legislation?
- How might federal climate change legislation impact COGs and MPOs?
- How can COGs and MPOs prepare for pending legislation on GCC or GHG reduction measures?

Workshop 13 provided an update on congressional and legislative action regarding climate change, GHG emissions reduction, cap-and-trade and many other issues that may impact COGs and MPOs engaged in transportation and air quality planning. Many of these issues continue to be in flux, with final impacts on local and regional planners to be determined in the coming years. The speakers emphasized the importance of COGs and MPOs educating themselves and their members on both the science behind climate change and the potential for federal and state climate change policy to impact their planning processes.

Workshop Topics and Presenters

- 13.1 Cap and Trade for Greenhouse Gas Reductions: Legislation and Issues
Brent Yacobucci, Congressional Research Service (CRS), focused on potential concepts for upcoming legislation on GHG and GCC.
- 13.2 The Federal Climate Change Debate
Manik Roy, Pew Research Center, focused on the federal response to GCC, including past actions taken and potential future actions.
- 13.3 CAFE Standards and Legislation
David Strickland, Senate Committee on Commerce, Science and Transportation, discussed the CAFÉ standards and potential future GCC legislation.
- 13.4 Green-TEA: Why How Much We Drive Matters a Lot
Steve Winkelman, Center for Clean Air Policy (CCAP), focused on his recently completed research and an innovative VMT-reduction pilot program in New York City.

13.1 Cap-and-Trade for Greenhouse Gas Reductions: Legislation and Issues



Brent Yacobucci

CRS

Background

Congress has and will continue to consider legislation related to climate change. CRS provides research and analysis for Members of Congress and their staff on many issues, including energy and environmental issues such as alternative fuels, advanced vehicle technologies, vehicle emissions standards and climate change.

Overview

Concepts for GCC legislation with the most momentum in Congress currently include: <http://www.loc.gov/crsinfo/aboutcrs.html>

- a carbon tax that would levy a tax on fossil fuels based on carbon content;
- a cap-and-trade program that would impose a cap on total annual emissions and create a market in allowances between large and small emitters; and
- a hybrid program that allows emitters to choose between meeting requirements of a cap-and-trade program or paying a set price (called a safety valve price) to the government.

Mr. Yacobucci noted that the impacts on COGs and MPOs will be determined based on the structure of any final legislation; however, there are many states currently taking action to address climate change through state and multi-state initiatives.

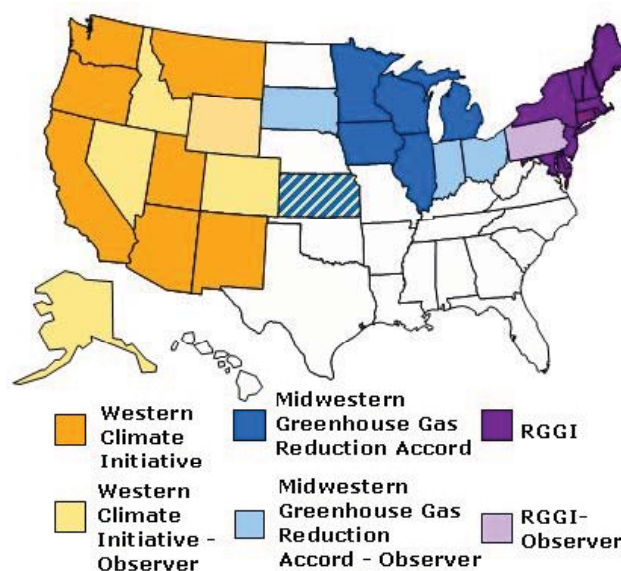


Figure 31. States Currently engaged in Regional Climate Change Initiatives

Outcomes

The implementation of cap-and-trade policies will depend highly on emission caps, sector coverage, the process for distributing allowances, and regional differences in energy supply, energy use and fuel mix. There are still many details to be determined prior to identifying impacts of potential legislation at the local and regional level.

13.2 The Federal Climate Change Debate

Background

The Pew Research Center is an independent, non-profit, non-partisan, non-government organization founded in 1998. One of its five program areas is the *Global Climate Change Center*.



Manik Roy

Pew Research Center
www.pewresearch.org

Transportation emissions account for over one quarter of U.S. greenhouse gas emissions. This contribution, which is constantly increasing, cannot be completely addressed by a cap-and-trade program. The number vehicles on the road, fuel usage and VMT continue to increase, causing increases in emissions despite improvements in CAFE standards and biofuel technologies. These issues are challenging, and many, including VMT, may be addressed in the next transportation authorization in 2009.

Overview

Mr. Roy discussed the 1992 United Nations Framework Convention on Climate Change (UNFCCC) objective of “stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system,” emphasizing that the UNFCCC greenhouse gas emissions reductions are voluntary.

He also discussed federal action on climate change issues to date, including:

- President George W. Bush’s opposition to the Kyoto Agreement
- President Bush’s dropped pledge to cap power plant carbon dioxide emissions (2001)
- McCain-Lieberman greenhouse gas cap-and-trade bill (2003)
- U.S. Senate’s nonbinding resolution supporting mandatory climate action (2005)

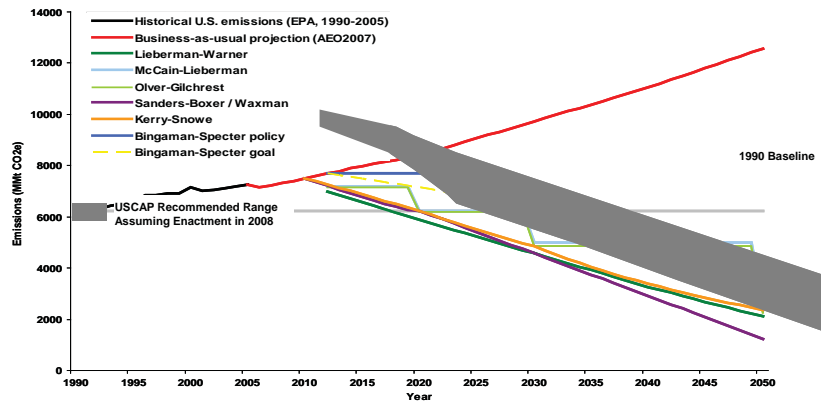


Figure 31. Comparison of Economy-Wide Cap-and-Trade Emissions Targets

Outcomes

While GCC legislation is an important issue, federal and international actions to date illustrate the slow, step by step process involved in obtaining buy-in and enacting changes. With this in mind, it appears that the enactment of a greenhouse gas cap-and-trade program in 2008 may be possible, although by 2010 may be more realistic.

13.3 CAFE Standards and Legislation

Background

The U.S. Senate Committee on Commerce, Science and Transportation is the Senatorial authorizing committee that addresses trade, transportation, consumer protection, internet commerce, antitrust, insurance and tourism issues.



David Strickland

U.S. Senate Committee on Commerce,
Science and Transportation

<http://commerce.senate.gov/public/>

Overview

While passing the new CAFE standards was politically challenging, the efforts resulted in the successful update to the standards with promise for increases in fuel economy and significant fuel savings. The new CAFE standards will achieve 35 miles per gallon by 2020, increase fuel economy by 40 percent and save 200 metric tons of fuel annually by 2010.

Currently, the coordination of ozone and GHG legislation is occurring in congressional committees and among congressional leaders; however coordination with both EPA and DOT will be required eventually.

Outcomes

Transportation reauthorization is due in 2009, which is likely to address alternative transportation initiatives that emphasize emissions reduction.

13.4 Green-TEA: Why How Much We Drive Matters a Lot



Steve Winkelman
CCAP

www.ccap.org

Background

CCAP is an independent, nonprofit think tank focused on climate and air quality policy at the local, national and international level. Mr. Winkelman recently completed work as a co-author for *Growing Cooler*, a handbook on climate change policy and design.

Overview

One point made clear through *Growing Cooler* is that for maximum effectiveness, air quality and transportation planners should coordinate with elected officials to plan and carry out local initiatives, focusing on restoring communities' ecosystems and reducing GHGs. For example, PLANYC 2030 is a three-year pilot program to reduce traffic in and around New York City by charging cars \$8 and trucks \$21 to drive on 86th Street between 6am and 6pm Monday through Friday. This program would increase transit funding by \$380 million per year, as well as:

- reduce VMT by 11 percent;
- decrease key pollutants by six to 12 percent; and,
- eliminate at least 94,000 daily motor vehicle trips.

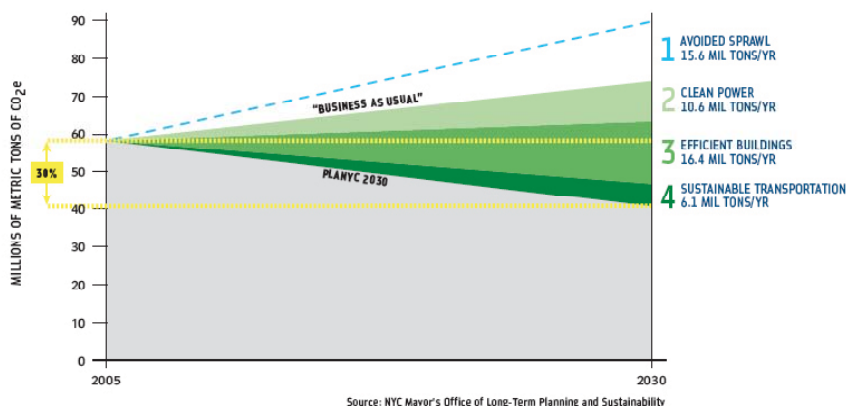


Figure 33. Projected Impacts of GHG Reduction Strategies (2005-2030)

Outcomes

Supporting planners in mitigating GCC and improving air quality requires local alternative transportation sources, land use scenario analyses, and effective regional long range transportation plans.

Workshop Fourteen, June 1, 2009: Integrating Air Quality and Transportation Planning: Regional Approaches to Setting GHG Reduction Targets

NARC held the 14th in a series of workshops on integrating air quality and transportation planning in Denver, CO, on June 1, 2009. This workshop provided participants with information on regional approaches to setting GHG emissions reduction targets, including factors for consideration and methodologies used to set reduction targets.

It featured two panels, the first discussing the development of strategic GHG emissions reduction targets and the second discussing current and future EPA and FHWA modeling tools and methodologies. Panelists will examine how regions may approach GHG emissions modeling and targeting based on statewide plans as well as based on local or regional plans developed outside of a statewide framework.

This workshop was moderated by:
Kathy Daniel, U.S. DOT FHWA

The questions addressed include:

- What tools are available for GHG inventories or other climate mitigation and air quality planning?
- How might regions utilize new FHWA or EPA tools and methodologies in climate mitigation or air quality planning?
- What type of climate mitigation or GHG emissions planning are COGs and MPOs currently required to conduct?
- What are some examples of local or regional methods for conducting GHG inventories or other climate mitigation planning?

Workshop 14 covered a variety of approaches to inventorying and reducing GHG emissions at the regional level. Speakers focused on existing as well as expected regulations and tools that can and will be used to meet these regulations. While the impact on and requirements of COGs and MPOs have not been fully identified to date, the presentations emphasized the importance of educating planners and local elected officials on technologies and tools currently available and in the pipeline.

Workshop Topics and Presenters

- 14.1 Integrating Air Quality and Transportation Planning
Doug Ito, Manager, CARB, addressed California's efforts to regulate GHG emissions with a focus on SB 375 and its requirements.
- 14.2 Policies for Integrating Air Quality and Transportation Planning
Hon. Jon Edney, SCAG, focused on the importance of integrated planning and increased collaboration as methods for addressing air quality, climate and transportation challenges.

- 14.3 Integrating Air Quality and Transportation (and Land Use) Planning
Gregg Thomas, City of Denver Department of Environmental Health, focused on developing strategic GHG reduction targets at the local level, specifically through the Greenprint Denver program.
- 14.4 Methodologies for Energy and Greenhouse Gas Analysis of Transportation Plans
Jeff Houk, FHWA, discussed methods for GHG analysis, focusing on the new MOVES modeling software and life-cycle analysis.
- 14.5 Understanding GHG Emissions from Transportation
Andrea Denny, U.S. EPA, discussed the need for GHG inventories and methods for calculating inventories from a variety of transportation sources.

14.1 Integrating Air Quality and Transportation Planning

Doug Ito
CARB
www.arb.ca.gov

Background

The Local Government Strategies Section at CARB is implementing California Senate Bill 375 (SB 375), which was signed into law on September 30, 2008. SB 375 integrates regional transportation, land use and housing and GHG emissions reduction planning into one process emphasizing regional scale planning, encouraging regional and local collaboration and supporting sustainable community planning.

Overview

The approach required by SB 375 involves a Regional Targets Advisory Committee (RTAC) made up of MPOs, transit agencies, air districts, the League of California Cities, the California State Association of Counties and various members of the public recommending GHG emissions reduction targets for MPO regions. These targets are reviewed by MPOs, ARBs and air districts, and will eventually result in “ambitious and achievable” targets.

Implementing SB 375 involves several steps, including setting an emissions reduction metric, identifying a target-setting approach, and determining how best to implement recommendations. The RTAC has not yet set a metric or selected a final approach for target-setting. Resolving disparities

in MPO travel demand modeling capacities and between state and federal law, as well as accounting for interregional travel will all be challenges in implementing SB 375. As California works toward resolving these and other issues associated with SB 375, CARB will continue considering RTAC recommendations, reviewing MPO suggestions, defining “ambitious and achievable” targets, and moving forward to review regional plans.

Outcomes

Building effective partnerships among local governments, regional planning organizations and a variety of state agencies will be critical to the eventual success of SB 375.

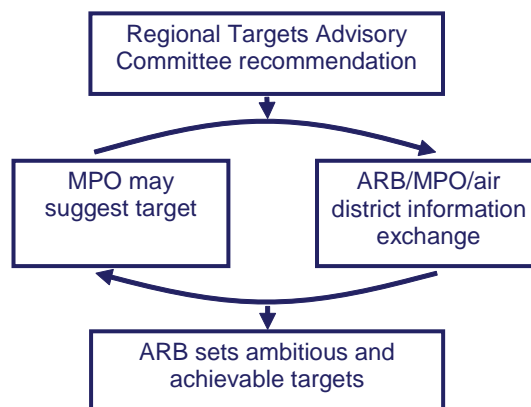


Figure 34. Process for Developing Ambitious and Achievable GHG Reduction Targets

14.2 Policies for Integrating Air Quality and Transportation Planning



Background

The Hon. Jon Edney serves as a Councilman for El Centro, CA, as well as the President of SCAG. SCAG is the largest COG in the U.S., serving as the MPO for Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial Counties, with a population of over 18 million and an area of over 38,000 miles.

Overview

While SB 375 is typically considered a GHG-focused bill, it does have strong sustainability language, requiring additional considerations for building a sustainable community through increasingly integrated regional planning. This sustainability focus can promote a statewide strategy rather than a statewide target and promote collaboration amongst local, regional and state-level parties.

www.scag.ca.gov

President Edney emphasized the importance of educating local elected officials and the public and encouraging increased collaboration amongst all parties as an essential aspect to both the success of SB 375 and the upcoming federal transportation reauthorization.

Outcomes

While the State of California and its local governments, COGs and MPOs are addressing air quality and climate change, achieving full public buy-in and the support of local elected officials will be essential to make a significant impact.

14.3 Integrating Air Quality and Transportation (and Land Use) Planning



Background

In 2005, Denver launched Greenprint Denver, a cooperative initiative with the University of Colorado at Denver to develop a GHG inventory and carbon footprint for the city. Through this program, Denver determined that the Kyoto goal, reaching a seven percent reduction in emissions between 1990 and 2012, was not achievable for the city.

Gregg Thomas
City of Denver Department of
Environmental Health
www.denvergov.org/deh

Overview

In 2005, Denver Mayor Hickenlooper committed to the U.S. Mayors Climate Protection Agreement to strive to meet or exceed Kyoto goals, identifying a 10 percent per capita emissions reduction goal for the city. In order to identify its GHG reduction goals, Denver reviews its plans, including *Denver Comprehensive Plan* (2000), *Blueprint Denver* (2002), and *FasTracks* (2004), *Greenprint Denver* (2005), *Strategic Transportation Plan* (2008) to identify projections, plans and existing best practices for land use, transportation, housing, economics, population and development. The Greenprint Advisory Council was also formed to review and critique GHG reduction strategies and make recommendations to the mayor.

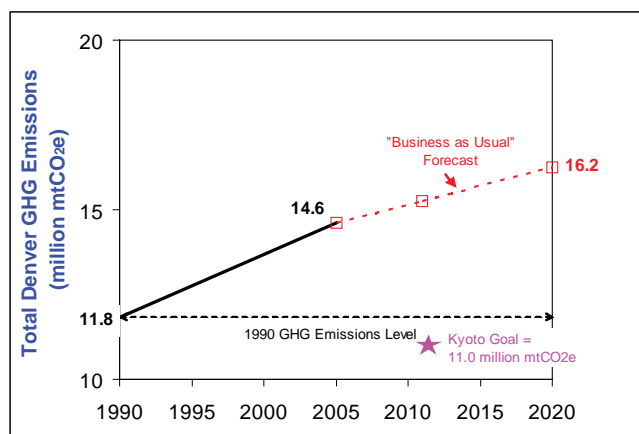


Figure 35. Total GHG Emissions in Denver

Outcomes

The City of Denver also recognizes that regional coordination, incorporating public health perspectives and identifying additional funding sources will all be essential to successfully reach their GHG emissions goals.

14.4 Methodologies for Energy and Greenhouse Gas Analysis of Transportation Plans



U.S. Department of Transportation
Federal Highway Administration

Jeff Houk
FHWA

www.fhwa.dot.gov

Background

FHWA does not currently require GHG analysis for plans or projects but does provide technical assistance to those interested in doing GHG analysis. Without a strong energy or GHG analysis, it is not clear if new transportation projects increase or reduce emissions. Analysis is complicated by the many factors influencing energy consumption and therefore GHG emissions, including direct (operational) energy, indirect energy, construction and maintenance energy and upstream/downstream energy.

Overview

There are a variety of methods for analyzing energy use or GHG emissions, including using VMT as a surrogate for GHG emission, using EPA's MOBILE6.2 emission factor model, using EPA's MOVES model (the upcoming replacement for MOBILE6.2), and using a life cycle analysis. A draft MOVES model was released in April 2009 and the final model is scheduled for release in early 2010. MOVES will have the capacity to perform energy and GHG analysis including total, fossil fuel and petroleum energy consumption, as well as CO₂, methane, nitrous oxide and CO₂ equivalents.

MOVES will offer an emission inventory, calculating the total energy consumption or GHG emissions for an area, or a look-up table output option, producing running emissions rates in grams per mile. Despite these improvements, the MOVES model still has limitations, including not integrating the fuel economy standards in the 2007 Energy Bill, not accounting for all bio-fuels emissions, no options for using California emissions standards, and inaccuracy for energy consumption and speed relationships for some vehicles.

A life-cycle analysis, pioneered by asset management and pavement groups examines the life-cycle cost of highway improvements, incorporating energy consumed by operation, construction, materials and even vehicle manufacturing when estimating a project's GHG emissions. This analysis identifies the period of time it takes for energy savings from operational improvements to offset the energy associated with construction, determines whether transit-oriented plans are more efficient than an HOV-oriented plan, as well as whether a more congested plan that also results in more compact land use result in lower energy use over time, and similar questions.

Outcomes

A state-of-the-practice framework for an energy use or GHG analysis planning protocol would incorporate:

- operational energy/emissions, including some lifecycle adjustments;
- construction energy/emissions; and,
- maintenance energy/emissions.

Resources

NCHRP 25-25 Task 17 report, "Assessment of Greenhouse Gas Analysis Techniques for Transportation Projects" www.trb.org/NotesDocs/25-25%2817%29_FR.pdf

FHWA Report, "Integrating Climate Change into the Transportation Planning Process." July 2008 www.fhwa.dot.gov/hep/climatechange/index.htm

March 2008 TRB report "The Potential Impacts of Climate Change on U.S. Transportation" www.trb.org/news/blurb_detail.asp?id=8794

DOT Center for Climate Change and Environmental Forecasting <http://climate.dot.gov/>

14.5 Understanding GHG Emissions from Transportation

Background

US EPA's Office of Air and Radiation focuses on supporting state and local governments developing policies and programs to address climate change. These programs and policies reduce emissions of air pollution and greenhouse gases, save customers money, promote economic development, and improve quality of life.



Andrea Denny
U.S. EPA
www.epa.gov

Reasons for conducting a local or regional GHG inventory include:

- identifying the greatest sources of GHG emissions within your region;
- understanding emission trends;
- quantifying the benefits of specific activities that result in GHG emissions;
- providing a basis for developing an action plan;
- tracking progress at reducing emissions; and,
- setting goals and targets for future reductions.

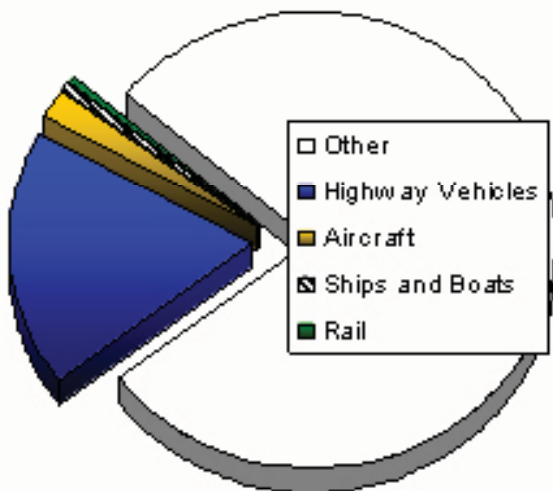


Figure 36. U.S. GHG Emissions by Source (2006)

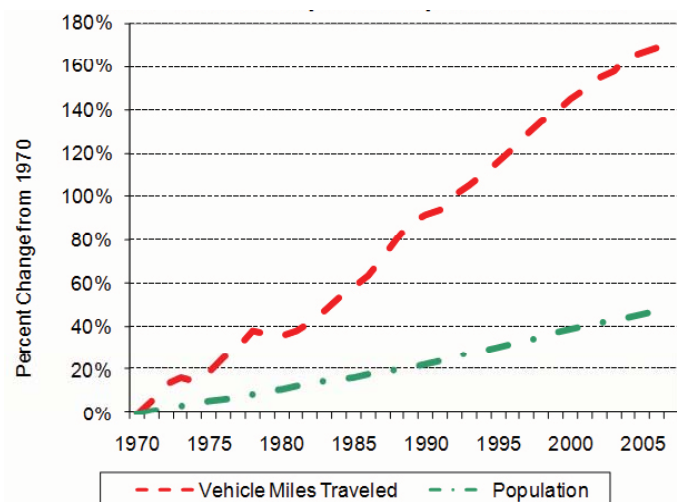


Figure 37. VMT and Population Growth (1970-2005)

Overview

A draft version of the *Regional Greenhouse Gas Inventory Guide (Guide)* from the EPA's Local Climate and Energy Program is currently available, including inventory basics and background as well as methods for calculating emissions from stationary energy production and consumption, industrial processes, waste, agriculture and forestry, and multiple transportation sources. It does not include information on or suggestions for regulations but is focused solely on planning efforts. The Guide also covers several techniques for calculating GHG emissions from motor vehicles, most of which were mentioned in earlier presentations, as well as methods for calculating rail, marine, and aviation and airport emissions.

An additional concept covered in the Guide is the impact GCC may have on infrastructure. A 2008 National Research Council Report noted that creating an inventory of critical infrastructure that may be vulnerable to climate change would be beneficial, as well as updating climate predictions that transportation planners and engineers use when dealing with critical infrastructure.

Outcomes

Although final rules and legislation is pending, GHG inventories are a current issue. Emphasizing the impact that GHG may make on public welfare and clearly illustrating the contributions that motor vehicle emissions make to this challenge is essential in moving forward and taking action to inventory and reduce GHG.

Resources

Endangerment Finding <http://www.epa.gov/climatechange/endangerment.html>

Mandatory Reporting Rule <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>

Notice of Intent: GHG Standards for Vehicles <http://www.epa.gov/otaq/climate/regulations.htm>

Renewable Fuels Standard <http://www.epa.gov/OMS/renewablefuels/>

Recovery Act Funding—Clean Diesel Program <http://www.epa.gov/otaq/diesel>

Appendix

15.1 Acronyms

Below is a list of acronyms that have been referenced throughout this report.

AAA	American Automobile Association	CTE	North Carolina State University's Center for Transportation and the Environment
AACOG	Alamo Area Council of Governments	CWA	Clean Water Act
AB	Assembly Bill	DAQ	Division of Air Quality
ACOG	Association of Central Oklahoma Governments	DEP	Department of Environmental Protection
ALA	American Lung Association	DEQ	Department of Environmental Quality
ARC	Atlanta Regional Commission	DLCD	Department of Land Conservation and Development
BAAQMD	Bay Area Air Quality Management District	DMAMPO	Des Moines Area Metropolitan Planning Organization
BID	Business Improvement District	DOT	Department of Transportation
BPM	Best Practice Model	DPF	Diesel Particulate Filter
BRACE	Bay Regional Atmospheric Chemistry Experiment	DVRPC	Delaware Valley Regional Planning Commission
CAA	Clear Air Act	EAC	Early Action Compact
CAAA	Clean Air Act Amendments	EIS	Environmental Impact Study
CAAP	Clean Air Action Plan	EPA	U.S. Environmental Protection Agency
CAFÉ	Corporate Average Fuel Economy	EWCOG	East-West Gateway Council of Governments
CAMPO	Capital Area Metropolitan Planning Organization	FAMPO	Fayetteville Metropolitan Planning Organization
CAPCOG	Capital Area Council of Governments	FAST	Fayetteville Area System of Transit
CARB	California Air Resources Board	FHWA	U.S. Department of Transportation Federal Highway Administration
CATS	Chicago Area Transportation Study	FTA	U.S. Department of Transportation Federal Transit Administration
CCAP	Center for Clean Air Policy	GCC	Global Climate Change
CCAQC	Catawba County Air Quality Committee	GHG	Greenhouse Gas
CCCEF	Center for Climate Change and Environmental Forecasting	GIS	Geographic Information Systems
CCP	ICLEI's Cities for Climate Protection Campaign	GRTA	Georgia Regional Transportation Authority
CCRPA	Central Connecticut Regional Planning Association	GVMC	Grand Valley Metropolitan Council
CDTC	Capital District Transportation Committee	HAP	Hazardous Air Pollutants
CDTG	Conformity Documentation Task Group	HEVAP	High Emitting Vehicle Assistance Program
CES	Cummins Emission Solutions	HFC	Hydro-Fluoro-Carbon
CMAQ	Congestion Mitigation and Air Quality Improvement Program	HGAC	Houston-Galveston Area Council
CO	Carbon Monoxide	HNO3	Nitric Acid
COG	Council of Government	HOT	High Occupancy/Toll
CRS	Congressional Research Service	HOV	High Occupancy Vehicle

ICLEI	International Council on Local Environmental Initiatives	NCDENR	North Carolina Department of Environment and Natural Resources
I/M	Inspection and Maintenance		
INCOG	Indian Nations Council of Governments	NCTCOG	North Central Texas Council of Governments
IPCC	Intergovernmental Panel on Climate Change	NH3	Ammonia
ISTEA	Intermodal Surface Transportation Efficiency Act of 1990	NIRPC	Northwestern Indiana Regional Planning Commission
ITS	Intelligent Transportation System	NJTPA	North Jersey Transportation Planning Authority
JAMA	Journal of the American Medical Association	NOACA	Northeast Ohio Areawide Coordinating Agency
JPACT	Joint Policy Committee on Transportation	NOx	Nitrogen Oxides
KYOVA	KYOVA Interstate Planning Commission	NYMTC	New York Metropolitan Transportation Council
LADCO	Lake Michigan Air Directors Consortium	PIAC	Public Involvement Advisory Committee
LCDC	Land Conservation and Development Commission	PM	Particulate Matter
LCI	Livable Centers Initiative	ppm	Parts Per Million
LDI	Livable Delaware Initiative	QRSII	Quick Response System II
LID	Low Impact Development	RC	Regional Council
LLNL	Lawrence Livermore National Laboratory	RDP	Research Development Plan
LMOS	Lake Michigan Ozone Study	RFP	Reasonable Further Progress
L RTP	Long Range Transportation Plan	RH	Regional Haze
MACC	Macatawa Area Coordinating Council	RITA	Research and Innovative Technology Administration
MAG	Maricopa Association of Governments	RTAC	Regional Targets Advisory Committee
MARTA	Metropolitan Atlanta Rapid Transit Authority	RTC	Regional Transportation Council
Metro	Elected Regional Government in Portland, OR	RTP	Regional Transportation Plan
MIS	Major Investment Studies	SACOG	Sacramento Area Council of Governments
MOA	Memorandum of Agreement	SANDAG	San Diego Association of Governments
MPO	Metropolitan Planning Organization	SEACO	Broward County Southeast Air Coalition for Outreach
MSA	Metropolitan Statistical Area	SEMCOG	Southeast Michigan Council of Governments
MTP	Metropolitan Transportation Plan	SETRPC	Southeast Texas Regional Planning Commission
MVEB	Motor Vehicle Emissions Budget	SIP	State Implementation Plan
MWAQC	Metropolitan Washington Air Quality Committee	SJCOG	San Joaquin Council of Governments
MWCOG	Metropolitan Washington Council of Governments	SMAQMD	Sacramento Metropolitan Air Quality Management District
N2O	Nitrogen Oxide	SPC	Southwest Pennsylvania Commission
NAAQS	EPA's National Ambient Air Quality Standards	SO2	Sulfur Dioxide
NARC	National Association of Regional Councils	SOV	Single Occupancy Vehicle

STIP	Statewide Transportation Improvement Plan
TBRPC	Tampa Bay Regional Planning Commission
TCRPC	Tri County Regional Planning Commission
TEA-21	Transportation Equity Act for the 21st Century
TCM	Transportation Control Measures
TERMs	Transportation Emission Reduction Measures
TERP	Texas Emissions Reduction Plan
TIP	Transportation Improvement Plan
TPAC	Transportation Policy Advisory Council
TOD	Transit Oriented Development
tpd	Tons Per Day
TRB	Transportation Research Board of the National Academies
TxDOT	Texas Department of Transportation
UAM	Urban Airshed Models
UNFCCC	United Nations Framework Convention on Climate Change
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WILMAPCO	Wilmington Area Planning Council
WMSRDC	West Michigan Shoreline Regional Development Commission
WPC	Work Program Committee
WPCOG	Western Piedmont Council of Governments

15.2 Topics and Activities to Further Integrate Transportation and Air Quality Planning

Throughout the course of this project, NARC, FHWA and EPA staff, along with workshop presenters and participants, have identified several topics and activities that could further integrate transportation and air quality planning. These suggestions have the potential to improve and spread best practices, educate planners and local elected officials on scientific and technological developments, and facilitate information-sharing among planners, policy officials, the scientific community and other key stakeholders.

Topics for further investigation, which could be featured in workshops, reports or other information sharing activities, include:

- **The impacts of new GCC planning requirements on regions.** While the legislation and regulations addressing GCC have not yet been determined, it is likely that future regulations and standards will impact regional transportation and air quality practices. Additional requirements will necessitate the use of new planning tools and techniques in an effort to develop both transportation and air quality plans. Building upon past workshops and presentations will facilitate this transition, allowing planners to feel comfortable with new technologies and requirements based on their previous experience.
- **Creating a community of “best practices” to develop the capacity of large and small MPOs.** One area of interest to the regional transportation planning community is how best to plan for GCC, regardless of pending legislation. Many regions nationwide are responding to their constituencies and seeking positive examples with which to plan for the future of their regions. Developing a body of practice, and as a result the capacity, in this area is fundamental in the effort to plan for Global Climate Change on the regional level.

Additional tools and activities that could be of use to transportation and air quality planners include:

- workshops on relevant topics addressing air quality or Global Climate Change;
- peer-to-peer exchanges for transportation and air quality planners;
- peer-to-peer exchanges for regional transportation and air quality planners and cognizant air quality management district planners;
- roundtable discussions featuring local, regional, state and federal stakeholders in the air quality planning process;
- support for NARC’s Mobile Regions (or Green Regions) Campaign website through the development of profiles or summaries of best practices;
- an in depth examination of a current topic through a series of webinars;
- the continuation of the compendium, with a transition to an online, interactive database of workshops; and
- peer-to-peer exchanges aimed at developing a matrix for regional-state-federal performance measures addressing GCC.

NARC will continue to examine these issues and many more through its conferences, workshops and Campaign initiative. Building upon the success of the environmentally-focused Green Regions Campaign, NARC will launch the Mobile Regions Campaign as an innovative outreach tool to advance the regional approach to transportation issues.

Through the campaigns, NARC is able to reach RCs, MPOs, local elected officials, businesses, government and citizens by communicating with relevant public and private partners; researching and surveying stakeholders; launching virtual toolboxes; developing interactive databases of best practices; and, holding educational briefings, workshops, webinars and training sessions. Continued support from FHWA, EPA and NARC's stakeholders will further NARC's work and continue to advance the integration of transportation and air quality planning and address changing standards and regulations.

About The National Association of Regional Councils

The National Association of Regional Councils (NARC), representing local elected officials and their regional planning organizations, serves as a national voice for regionalism by advocating for regional cooperation as the most effective way to address a variety of topics including transportation, economic and community development, environment and homeland security. NARC's member organizations are composed of multiple local governments that work together to serve American communities - large and small, urban and rural. In 2008, NARC launched the first of four public awareness campaigns – Green Regions, Mobile Regions, Build Regions and Secure Regions. For additional information, please visit www.NARC.org.

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