

Commission Briefing Paper 4D-05

Evaluation of Transportation Conformity and Implications for Surface Transportation Infrastructure

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Introduction

This paper is a part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU. The papers are intended to synthesize the state-of-the-practice consensus on the issues that are relevant to the Commission's charge outlined in Section 1909, and will serve as background material in developing the analyses to be presented in the final report of the Commission.

This paper begins with an assessment of the Nation's air quality status. It follows with a brief discussion of the transportation conformity process including a summary of recent changes included in SAFETEA-LU. The paper then documents an analysis of the potential impacts of some emerging issues on the transportation conformity process. The paper concludes by identifying future trends that may have an impact on the transportation conformity process and its potential implications on surface transportation.

Background and Key Findings

- While the Clean Air Act has led to reduced emissions from all air pollution sources during the past 30 years, the greatest success can be found in the reduction of motor vehicle emissions as reported in the Environmental Protection Agency (EPA) national emissions trends.
- Since 1970, population, gross domestic product and vehicle miles travel have increased by 41 to more than 160 percent, during the same time period, total on-road motor vehicle emissions of ozone precursors (volatile organic compounds (VOC) and oxides of nitrogen (NO_x)), carbon monoxide (CO), particulate matter (PM-10), lead (Pb), and sulfur dioxide (SO₂) have *decreased* by 41 to 73 percent.
- The majority of the emissions reductions have resulted from stricter emissions standards, improved engine technology, and cleaner fuels. The automotive, fuels, highway, and transit communities have contributed tremendously to achieve this success in improving air quality while at the same time working to address increasing demands to improve mobility.
- Despite dramatic improvements in air quality, some of the nation's largest metropolitan areas still face challenges in meeting National Ambient Air Quality Standards (NAAQS). These areas are still subject to transportation conformity requirements.

- Of the many changes that were introduced by the 1990 Clean Air Act Amendments (CAA), none has more impacts on the transportation community than the expanded requirements of the transportation conformity process. First introduced in the 1977 CAA, the practice of the current transportation conformity process was introduced in the 1990 CAA and was defined by the first transportation conformity rule (40 CFR parts 51 and 93) in 1993 and several subsequent revisions. The rule was last revised in March 2006.
 - The transportation conformity process ensures that planning for transportation systems is consistent with and conforms to State air quality plans for attaining and maintaining the health-based NAAQS and that transportation projects will not cause or worsen air quality problems in the area.
 - Historically, on average there were about 6 conformity lapses in any given month, affecting metropolitan areas of all sizes. About 40 percent of all conformity lapses have occurred for air quality reasons (e.g. failure to meet a motor vehicle emissions budget) while the rest have occurred for other reasons (e.g. failure to update a transportation plan or TIP in a timely manner). Since October 2006, all the nonattainment and maintenance areas have been in full compliance of the conformity requirements. Currently, no area is in a conformity lapse.

- Recent SAFETEA-LU changes to the conformity provisions provided flexibility to the conformity process.

- With potential new or revised NAAQS, some new or expanded nonattainment areas will continue to face the requirements of demonstrating that their transportation investments are in conformity with clean air goals through the transportation conformity process.

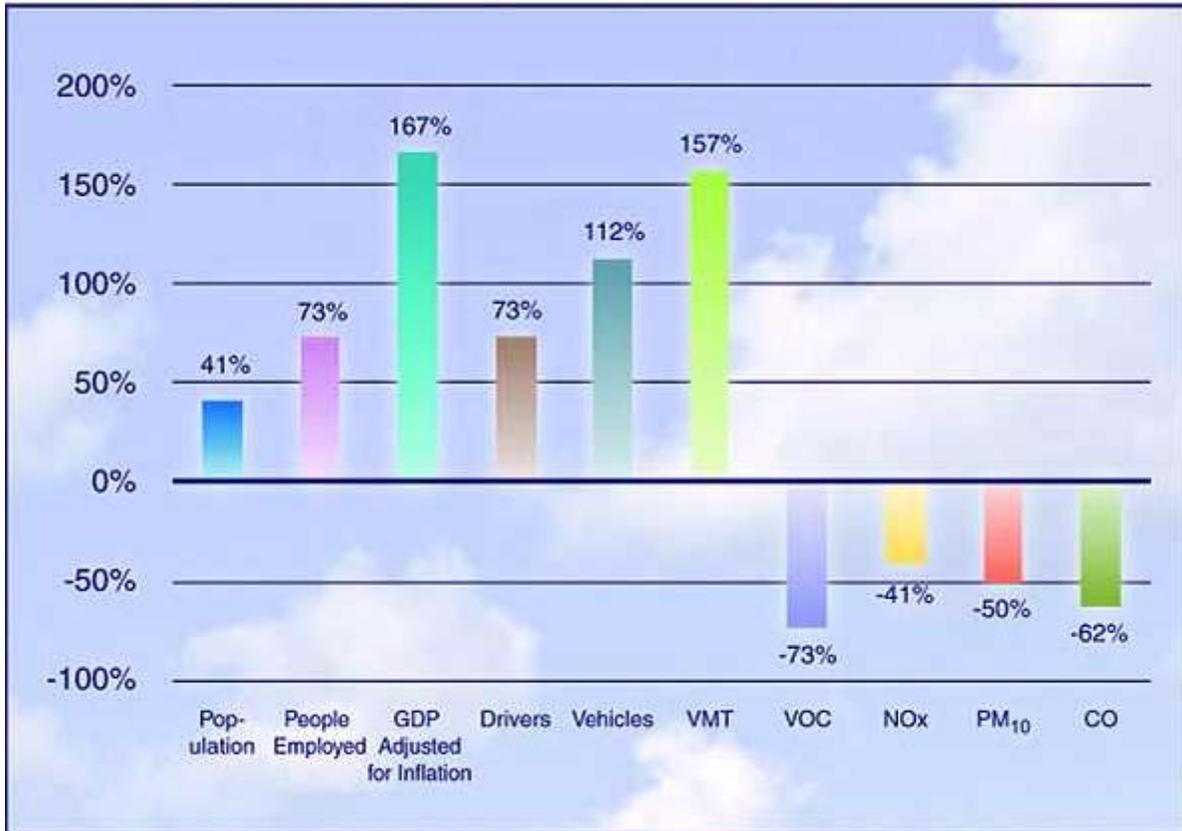
Air Quality Improvement Contribution by Surface Transportation Sources

While the Clean Air Act has led to reduced emissions from all air pollution sources over the past 30 years, the greatest success can be found in the reduction of motor vehicle emissions as reported in the Environmental Protection Agency (EPA) national emissions trends¹.

Since 1970, population has increased 41 percent; the number of people employed has increased 73 percent; the Gross Domestic Product, adjusted for inflation, has increased 167 percent; the number of drivers has increased 73 percent; and total vehicle miles traveled (VMT) per year have increased 157 percent. At the same time, total on-road motor vehicle emissions of ozone precursors (volatile organic compounds (VOC) and oxides of nitrogen (NO_x)), carbon monoxide (CO), particulate matter (PM-10), lead (Pb), and sulfur dioxide (SO₂) have *decreased ranging* from 41 to 73 percent. [Figure1].

Figure 1. Percent change of population, GDP, and VMT, 1970-2002

¹ EPA's National Emissions Trends Reports are available online: <http://www.epa.gov/airtrends/reports.html>



Source: FHWA. *Transportation Air Quality Selected Facts and Figures*. January, 2006 (Page 11)

The contribution to total emission reduction from motor vehicle emissions has also been significant -- since 1980, more than 80% of total emission reductions have come from surface transportation sources. For VOC and CO, motor vehicle emission reductions were greater than the reductions from all other sources. The automotive, fuels, highway, and transit communities have contributed tremendously to achieve this success in improving air quality while at the same time working to address increasing demands to improve mobility.

Contribution Of Standards for Vehicle Emissions and Fuels

The majority of the emissions reductions have resulted from stricter emissions standards, improved engine technology, and cleaner fuels. It is expected that engines and fuel are to become even cleaner under recent EPA-issued emissions standards and cleaner fuel requirements. Between 2004 and 2007, more protective tailpipe emissions standards will be phased in for all passenger vehicles, including sport utility vehicles (SUVs), minivans, vans and pick-up trucks. This regulation marks the first time that larger SUVs and other light-duty trucks are subject to the same national pollution standards as cars and that light-duty diesel vehicles are subject to the same standards as gasoline vehicles. In addition, EPA made standards for sulfur in gasoline more stringent, which will ensure the effectiveness of low emission-control technologies in vehicles and reduce harmful air pollution. When the new tailpipe and sulfur standards are implemented, Americans will benefit from the clean air equivalent of removing 164 million cars from the road. These new standards require passenger vehicles to be 77 to 95

percent cleaner than those on the road today and the reduction of the sulfur content of gasoline by up to 90 percent.

Many expect that motor vehicle emissions will continue to be reduced as new heavy-duty vehicles that meet the 2004 emissions standards for heavy-duty engine standards enter the fleet. Beginning with the 2007 model, heavy-duty engines for trucks and buses must meet even tighter emissions standards, and ultra-low sulfur diesel fuel was required to be available by October 2006 (with a level of sulfur in diesel fuel 97 percent lower than earlier standards). As a result, after a phase-in period, each new truck and bus will be more than 90 percent cleaner than current models.

However, despite dramatic improvements in air quality, some of the nation's largest metropolitan areas still face challenges in meeting and maintaining the current NAAQS. Furthermore, the Nation as a whole, and the transportation community in particular, face additional challenges as new air quality standards are implemented. The PM 2.5 standards issued in 1997 became effective in 2005, and EPA just recently finalized more stringent PM2.5 standards in 2006 and is in the process of reviewing the 8-hour ozone standards. Some areas may be designated nonattainment for the first time under the new or revised NAAQS. Other existing nonattainment areas may become larger and involve more jurisdictions under the new standards. Areas will continue to face the requirements of demonstrating that their transportation investments are in conformity with clean air goals through the transportation conformity process.

What is Transportation Conformity?

The concept of transportation conformity - coordinating the transportation and air quality planning processes and ensuring that transportation plans and Transportation Improvement Programs (TIPs) are consistent with SIPs (State Implementation Plans) in nonattainment and maintenance areas - began with the Clean Air Act Amendments of 1977. The current requirements to ensure this coordination were defined in the 1990 Clean Air Act Amendments (CAA).²

The transportation conformity provisions of the 1990 CAA prohibits the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and Metropolitan Planning Organizations (MPOs) from approving or funding transportation plans, programs, or projects that do not conform to the State Implementation Plan (SIP). In short, transportation conformity is a way to:

1. Ensure that planning for transportation systems is consistent with and conforms to State air quality plans for attaining and maintaining the NAAQS, and
2. Ensure that neither the transportation system as a whole nor individual transportation projects cause new or worsen existing air quality violations.

In order to receive transportation funding or approvals from the FHWA/FTA, State and local transportation agencies with plans, programs or projects in nonattainment or maintenance areas,

² 42 U.S.C. §7506.

must demonstrate that they meet the transportation conformity requirements³. In addition, Title 23 of United States Code (23 U.S.C.), sets forth metropolitan planning provisions that reinforce and complement the Clean Air Act's conformity provisions. To meet the requirements, MPOs must explicitly show that the anticipated emissions resulting from implementation of transportation plans, programs and projects are consistent with and conform to the purpose of the SIP for air quality.

The Transportation Conformity Process: Coordinating Transportation and Air Quality Planning

As mentioned earlier, transportation conformity is designed to ensure that Federally-funded or approved highway and transit plans, programs, and projects conform to the air quality goals and priorities established in a SIP. MPOs⁴, and the FHWA and the FTA determine whether transportation plans, programs, and projects conform to a SIP by comparing the total expected emissions from the transportation system within the nonattainment or maintenance area with the motor vehicle "emissions budget" in the SIP. Conformity determinations must also demonstrate that transportation control measures (TCMs) are being implemented according to SIP commitments.

Essential to the transportation conformity process is the interagency consultation process which has played a crucial role in the development of more realistic and achievable transportation and air quality plans. The interagency consultation requirements also created stronger institutional links between transportation and air quality agencies than what existed prior to enactment of the 1990 CAA.

The transportation conformity provisions have also been instrumental in fostering improvements to the travel demand and emissions modeling processes, because of the specificity of data necessary to meet conformity requirements. Some areas have found it necessary to modify their transportation plans and TIPs to include additional projects such as transit projects that helped reduce emissions. Some areas have also decided to consider long term changes in land use as part of their strategy to meet conformity requirements.

Over the years, the conformity process has undergone a number of attempts to streamline the implementation of the process. Most recently, a number of changes to the conformity provisions were included in SAFETEA-LU to provide flexibility and improvements to the process.

Federal actions not subject to the Transportation Conformity regulation are subject to the requirements of the General Conformity regulation, and sometimes aspects of a multi-modal project may be subject to the General Conformity regulation, making compliance more complex. One difference between the two regulations are that under General Conformity, only the individual action is analyzed, in contrast to the analysis of the metropolitan transportation plan as a whole under transportation conformity.

³ 40 CFR, Parts 51 and 93.

⁴ Conformity determinations for projects outside of the metropolitan area boundary are the responsibility of FHWA/FTA and the project sponsor, which usually is the State DOT.

Summary Of Transportation Conformity Changes in SAFETEA-LU

On August 10, 2005, SAFETEA-LU revised a number of aspects of the transportation conformity provisions in the CAA including:

- providing an additional six months to re-determine conformity after new state implementation plan (SIP) motor vehicle emissions budgets are either found adequate, approved or promulgated;
- changing the frequency requirements for transportation conformity determinations from 3 to 4 years;
- providing an option for reducing the time period covered by conformity determinations;
- providing procedures for areas to use in substituting or adding transportation control measures (TCMs) to approved SIPs;
- adding a one-year grace period for conformity lapses; and
- streamlining requirements for conformity SIPs.

These changes, effective immediately after the enactment of SAFETEA-LU, provided flexibility to nonattainment and maintenance areas. The EPA is required to revise the conformity regulation to reflect these changes by August 10, 2007.

Conformity Lapse

When an area is unable to make a conformity determination by the required deadline or at the end of the lapse grace period, a “conformity lapse” occurs. During a conformity lapse, the use of Federal highway and transit funds and/or approvals is restricted to only the following six types of transportation projects:

1. Exempt projects⁵
2. TCMs in approved SIPs
3. Federal project phases that received funding commitments or approvals prior to the lapse
4. Non-regionally significant non-Federal projects
5. Regionally significant non-Federal projects approved by the non-federal entity before the lapse.
6. Traffic synchronization projects⁶

Historically, on average there were about 6 conformity lapses in any given month, affecting metropolitan areas of all sizes. About 40 percent of all conformity lapses have occurred for air quality reasons (e.g. failure to meet a motor vehicle emissions budget) while the rest have occurred for other reasons (e.g., failure to update a transportation plan or TIP in a timely manner.). However, since October 2006, all the nonattainment and maintenance areas have been in full compliance of the conformity requirements. Currently no area is in a conformity lapse.

⁵ Identified under 40 CFR §93.126, and 40 CFR §93.127

⁶ 40 CFR 93.128

It is important to note that conformity lapses will not lead to a loss of Federal transportation funds to a State. However, the type of projects that can go forward during a lapse is limited, and delivery schedules of projects could be impacted. Delays may cause construction costs to increase, depending on the length of the lapse.

Emerging Issues

A number of emerging issues will have an impact on the conformity process in the future: These issues could affect the ability of MPOs to demonstrate conformity, thus potentially affecting project delivery schedules.

1. Interaction of SIP and conformity planning assumptions and emissions models

Conformity determinations and SIPs are required to use the latest planning assumptions and latest emissions model at the time of each update. Transportation plans and TIPs and their associated conformity determinations are required to be updated at least once every 4 years. SIPs are not required to be updated on the same cycle, and assumptions and emissions model used in the SIP may become outdated over time. Since these documents are updated at different frequencies, areas can encounter differences with regard to planning assumptions and emissions models.

EPA periodically updates its motor vehicle emissions models to reflect the latest science available as well as issue guidance to help areas adjust their SIP budgets as necessary. This can pose challenges for MPOs. For example, transportation agencies in many areas were concerned with the January 2002 release of EPA's new emissions estimation model, MOBILE6, which required conformity determinations be based on this new model after a two-year grace period provided by the transportation conformity rule, while not requiring that all existing SIP emissions budgets developed using the older models be updated. The transportation agencies were concerned they may not be able to demonstrate conformity when comparing results from the new model with the emissions budgets in the SIP based on the old model. However, experience has shown that when conformity challenges have occurred, state and local agencies have updated SIPs to reflect new information. It should be noted that while there is no requirement to update existing SIPs all future SIP revisions must be based on the latest information and emissions models available. Also, nothing precludes a state from revising an existing SIP to account for new information or a new emissions model. However, based on FHWA's experience, this type of SIP revision has been resource- and time-intensive, and requires substantial coordination from transportation and air quality agencies.

A similar transition will occur in the future when EPA releases the next emissions model, MOVES. While progress is being made in improving analysis tools, many transportation professionals are concerned about the ability of these tools to accurately reflect project emissions from changes in the transportation system. As new planning assumptions and emissions models are released, challenges in demonstrating conformity could occur in the future, which could result in conformity lapses and possible delays in project delivery. We expect that EPA and DOT will continue to work together to provide a grace period before new models are required to be used in conformity determinations so that, if necessary, SIPs can be revised.

2. New Air Quality Standards Could Increase Number of Areas Subject to Conformity Process

In 2006, EPA promulgated more stringent air quality standards for fine particulate matter (PM-2.5). EPA is also in the process of reviewing and may revise the existing ozone standards in the near future. Transportation conformity will apply to new nonattainment areas one year after the effective date of the final designations.

Although it is too early to tell whether the number and size of nonattainment areas will change under the new standards, it is anticipated that some of these newly designated nonattainment areas will be subject to the conformity process for the first time while others may have to deal with conformity issues as part of a complex nonattainment area. This could potentially increase the number of areas that are at risk of falling into conformity lapse, thereby delaying project delivery. However, recent experience shows that a significant number of areas did not lapse when conformity began to apply in 8-hour ozone and PM2.5 areas. Nearly all 8-hour ozone areas met conformity requirements by June 15, 2005 and every PM2.5 area met conformity requirements by April 5, 2006. This success is attributable to proactive Federal training, guidance, and technical assistance.

3. Future Emissions Reductions From Surface Transportation Facilities Through Technology

Advancement in both engine and fuel technologies have contributed significantly in reducing on-road and non-road mobile sources. EPA has provided multiple guidance documents for implementing technologies such as anti-idling devices and diesel retrofits. Areas can continue to explore innovative technologies as “transportation” strategies –for example, diesel engine retrofits. The transportation conformity process will continue to recognize transportation agencies’ contribution to clean air goals for existing as well as future technologies.

4. Long Term Future of The Conformity Process

The Nation has had great success in improving air quality under the CAA. National levels of all criteria pollutants have gone down over the last 20 years. Nationally, ozone levels have improved considerably, and carbon monoxide levels are the lowest recorded in the last 20 years. This air quality improvement is consistent across all regions of the country. Although the Clean Air Act requires that all areas be in attainment in the next decade under the existing NAAQS, too many uncertainties exist to predict the long-term future of the conformity process.

Summary

It is undeniable that the transportation conformity process has played an important role in the effort of reducing motor vehicle emissions and improving air quality. Over the years, transportation and air quality professionals have worked closely and successfully to improve the transportation conformity process. For example, the transportation conformity process has provided a forum for improved communication between transportation and air quality officials to develop improved transportation planning and emissions models and to decide on additional

pollution controls, SIP revisions and other remedies to conformity difficulties. Recent conformity changes in SAFETEA-LU is another example.

Although the number of areas in a conformity lapse has historically been small (and currently is zero), issues are emerging that could create a higher risk of lapse and hence affect project delivery. As new planning assumptions and emissions models are released challenges in demonstrating conformity could occur in the future. New air quality standards will likely increase the number of areas that need to demonstrate conformity, also increasing the risk of conformity challenges. It may be necessary to continue the conformity process so that transportation plans continue to be consistent with state air quality goals. Our experience has shown that that conformity lapses can be significantly reduced or eliminated by EPA and DOT providing early and on-going training and technical assistance to new and experienced conformity implementers. Although the Clean Air Act requires that all areas be in attainment in the next decade, too many uncertainties exist to predict the long-term future of the conformity process.

References

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4. 109th Congress, 1st Session, House of Representatives, Report 109-203, *Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users*, Conference Report of the Committee of Conference on H.R.3, July, 28, 2005.
5. 109th Congress, *Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users*, Public Law 109-59, August 10, 2005.
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9. Federal Highway Administration, *Transportation Conformity Reference Guide*, (available online only: http://www.fhwa.dot.gov/environment/conformity/ref_guid/index.htm) March, 2006.

CONSOLIDATED COMMENTS FROM MEMBERS OF THE BLUE RIBBON PANEL OF TRANSPORTATION EXPERTS - PAPER 4D-05

One reviewer commented as follows:

In general, this paper's premise provides very useful and timely information related to emerging issues on the transportation conformity process. If it were expanded, the analysis should be useful to transportation planners. It is in this light that the following comments are made:

- In discussing current status, it would be useful to have understanding of court cases and decisions regarding transportation conformity.
- On page 4, Contribution of Standards for Vehicle Emissions and Fuels. Clarification would be useful regarding the timeframe for comparative improvement resulting from new tailpipe emission standards.
- Also on page 4, Contribution of Standards for Vehicle Emissions and Fuels. It would be useful to distinguish the difficulties that will be encountered by newly designated non-compliance areas from the types of experience larger metropolitan areas already experience.
- On page 5, The Transportation Conformity Process. Coordinating Transportation and Air Quality Planning. It would be useful to have more detail regarding the new conformity provisions in SAFETEA-LU, as well as USEPA regulatory changes and historical interpretations by courts.
- On page 7, Emerging Issues. It would be useful to have an understanding of the changes that have occurred historically to address mismatch in terms of the conformity determination and SIP's
- On page 8, Long Term Future of Conformity Process. It might be useful to explain the types of projects to which federal funds have been distributed – system preservation versus new constructions.