

# Surviving the Turbulence: the Transportation-Air Quality Arena, 1999-2000

by Michael Koontz

When Congress passed the Clean Air Act (CAA) in 1970, the ambitious optimism of many legislators probably wouldn't have allowed them to envision that the war on dirty air would stretch into the 21st century. Indeed, the major amendments of 1977 and the sweeping effects of the 1990 amendments seemed to open up whole new fronts in a battle that was neither lost nor won -- it just wouldn't go away.

It's difficult to imagine for transportation and air quality planners, but CAA survived and evolved for its first 20 years without the conformity process that we know today. Introduced by the 1977 CAA amendments, "conformity" was invigorated by the 1990 amendments because, despite all the previous efforts, more than 175 areas of the United States were classified in 1990 as "air quality nonattainment areas" -- parts of the country failing to meet at least one air quality standard.

The 1990 CAA amendments expanded the existing regulatory procedures and provided a matrix of deadlines for each of these nonattainment areas. They also required each state to develop a state implementation plan (SIP) that addresses these measures and milestones and includes an emissions budget that shows a progressive track toward attainment of the standards. The transportation plans and programs of state and regional planning organizations must be in "conformity" with SIPs.

With the implementation of the 1990 amendments and the development of the 1993 final rule, transportation conformity has become part of the lexicon for transportation professionals in the vast majority of major metropolitan areas around the country. The conformity process has been spelled out and has taken on a structure all its own since the original rule and the several major amendments in 1995 and 1997. Regardless of one's approach to conformity -- as an ally or an adversary -- the process itself has commanded awareness, respect, and occasionally even a little fear as it wields considerable control over many transportation plans and programs.

Despite the almost monolithic treatment of the conformity rule and its amendments, changes have come about recently to adjust this "living process." In addition to these mostly legal proceedings, other developments that add to this dynamic process have taken hold from the transportation and technology side.

## Recent Developments

Just as state and local transportation and air quality agencies were becoming familiar with the modified transportation conformity rule, a spate of legal decisions and settlements confronted them in 1999. The fallout of these legal proceedings continues and, in some cases, is accelerating in 2000.

The earliest of the 1999 events was a March decision from the U.S. Court of Appeals for the District of Columbia Circuit, which dealt a blow to the transportation conformity amendments from 1997. In response to a suit filed by the Environmental Defense Fund (recently renamed Environmental Defense), the court's decision minimized some of the flexibility permitted by the amendments in the development of emissions budgets and state air quality plans. In addition, the grandfathering provisions of the 1993 rule, which provided an earlier point of decision and some limited protection for an advancing project, were struck down.

Close on the heels of this court decision, a hard blow was dealt to the air quality program of the Environmental Protection Agency (EPA). In May 1999, the same D.C. court granted a request by several states to delay EPA's implementation of its eight-hour ozone standard. The agency's new, more stringent standard of 0.08 parts per million (ppm -- a simple ratio of parts of ozone per million parts of generic air) was widely regarded as the keystone in EPA's air pollution control plans for the 21st century. While the standard was not vacated, or voided, by the court's action, the decision to remand it (to send it back to EPA) means that agency officials cannot enforce the standard. The U.S. Supreme Court has committed to rule on this case in its upcoming session.

About the same time, the same court put the brakes on EPA's "NOx SIP call," which was EPA's attempt to

control nitrogen oxides, a major ozone precursor, on a supra-regional basis. The call for new, air quality SIPs covering regional NOx controls was placed on indefinite hold as a result of the court's action. The NOx SIP call was neither remanded nor vacated, but the tenuous status of its enforcement or ultimate deadline for submittal has served as an obstacle to many efforts in the 22 Eastern states where the rule applied. (Note: The court's stay was overturned this spring, and the NOx SIP call is moving again). This major regional program may not be a major issue for transportation plans and programs because it takes special aim at stationary sources of nitrogen oxides pollution, such as power plant emissions.

Along with NOx SIPs, states also have high hopes for several petitions filed under Section 126 of the Clean Air Act. This provision allows states to request EPA's direct regulation of major emitting sources that have contributed to nonattainment through the downwind transport of their emission plumes. Usually targeting large stationary/smokestack sources, EPA granted the petitions of four Eastern states in December 1999.

Amid all the legal and technical wrangling related to these issues, air quality professionals continued to make progress toward clean air attainment in the country's most difficult ozone areas. Though moving ahead, this progress had fallen well behind the milestones called for in the 1990 amendments.

Consequently, the Natural Resources Defense Council (NRDC) and others brought suit against EPA for failing to disapprove SIPs that do not meet federal clean air requirements. In November 1999, EPA agreed to a proposed consent decree with the D.C. court. The out-of-court settlement appeared to focus on the motor vehicle portion of states' emissions budgets, and EPA pledged to issue findings on the adequacy of these budgets or to disapprove the respective SIPs by May 31, 2000.

### The Effects on Transportation

By this time, many readers are wondering why this play-by-play on the legalities and programs of the Clean Air Act is written in *Public Roads*. Simply stated, the effects of these clean air developments and initiatives on transportation programs can be enormous. Indeed, these effects have been felt before in many jurisdictions as the conformity process kicked into action.

The state implementation plan is each state's controlling document for issues pertaining to air quality nonattainment or maintenance. Within the SIP are a number of emissions inventories and budgets. The operations of all "sectors" (to use CAA terminology), including heavy industry, light industry, highway transportation, and heavy equipment off-highway, are driven by the approved emissions budgets. Consequently, as with any budget, overspending in one sector must be balanced by reductions in that sector or in other sectors. In the most rudimentary SIP terms, if the smokestacks are out-of-control, then the cars need to be cleaner and vice versa.



**Transportation control measures may not be the "silver bullet" in the fight for cleaner air, but many see an important role for TCMs. Some cities have generated new systems, like the rail transit line above, while others have enhanced existing services, such as this commuter bus route.**

Of all these actions and decisions, the NRDC settlement has had, perhaps, the greatest effect on state and local governments. To avoid CAA sanctions that can restrict certain types of federal funding and to avoid other consequences, state air quality agencies and transportation departments intensified their efforts to complete adequate mobile-source emission budgets. These budgets, part of ozone attainment plans, are required for many of the country's large urban areas, including Atlanta; Baltimore; Chicago; Hartford, Conn.; Houston; Milwaukee; New York; Philadelphia; Springfield, Mass.; Washington, D.C.; and Wilmington, Del. Without these budgets and the approval of EPA regulators, the transportation conformity process could prompt an abrupt halt as area plans and programs lapse.

The D.C. court's decision striking down a number of the provisions of the conformity rule posed short-term effects on the planning process. With the loss of the project grandfathering provisions, many areas faced the prospect of delayed projects, renewed environmental processes, and general delays to programs that were otherwise ready to go. Consequently, the accelerated development of emissions budgets and the concentrated efforts of EPA adequacy reviewers pre-empted the widespread disruption that could have resulted from the decision.

Several of the legal or regulatory events that erupted during 1999 ultimately served to assist transportation and air quality officials in setting budgets. Controversial since its inception under the Ozone Transport Assessment Group (OTAG), the notion of NO<sub>x</sub> control at the regional level came a step closer to reality with the March 2000 decision placing the NO<sub>x</sub> SIP back on track. States that had been reluctant to credit these regional controls in their SIPs were now encouraged to do so; the majority of emissions reductions through EPA's NO<sub>x</sub> control model are linked to point-source control measures.

In the midst of so many external events in the past year, state and local officials remained saddled with the responsibilities of the conformity process, and outside of the regulatory environment, a number of technological developments affected the mobile-sources side of the equation. One of the new developments that became available just in time for some jurisdictions was the Tier 2 vehicle-emission standards. In December 1999, President Clinton announced these new regulations limiting both tailpipe emissions and gasoline sulfur. With most of the package slated to be in effect by 2004, metropolitan planning organizations undergoing a difficult conformity process have been given the option of using these preliminary Tier 2 credits from EPA. These new tailpipe standards serve to create a much cleaner future vehicle fleet, generating reductions in both NO<sub>x</sub> and hydrocarbons. Areas that have adequate, yet extremely tight mobile-source budgets have been able to gain some breathing room via the Tier 2 credits.

The complex systems in use to analyze both transportation demand and air quality are becoming even more involved. In development for several years, the Transportation Analysis Simulation System (TRANSIMS) model from the U.S. Department of Transportation is expected to add much more detail on trip-making, including movement by time-of-day, purpose, and other variables that have been more elusive for travel modelers. In addition, TRANSIMS is expected to provide more insight into the benefits of transportation control measures and other strategies that use travel options to fight air pollution.

On the air quality side of the modeling equation, EPA is scheduled this year to release its latest installment of its emissions factor model, MOBILE6. Ambitious changes are expected from this version -- some of which may lower projected emissions from the vehicle fleet and others are likely to drive emissions estimates higher.

Lowering the projections is largely attributed to EPA's recalculation of engine deterioration rates. The agency's research now credits cars for remaining cleaner for much longer portions of their useful lives. Prior estimates from earlier versions of the MOBILE model were based on accelerated deterioration --and much more emissions -- at 50,000 miles (80,000 kilometers). The new MOBILE6 shows only a slight difference in emissions related to deterioration from the 50,000-mile mark all the way to 100,000 miles. This appears to be good news for air quality modelers preparing SIPs and conformity determinations.

Now the bad news -- some model improvements will raise emissions estimates. The effects of aggressive acceleration have never been estimated. These effects, primarily tied to rapid acceleration and abrupt braking, will be added to the simulated driving behaviors embedded in MOBILE6. In addition, the substantial effects on emissions from vehicle air-conditioning use are undergoing a major update. Detailed tables of temperature and humidity linked to the operation of a vehicle air-conditioning compressor will be matched with geography to



**Wilmington, Del., with its riverfront industrial area (shown in the background), was one of several metropolitan areas that was required to submit a mobile-source emission budget as part of its ozone attainment plan.**

**[credit photo to James T. O'Brien, Delaware DOT)**

project more accurately the resulting summertime emissions.

States and metropolitan planning organizations are also moving along with their own innovative methods and measures for reaching transportation conformity. Wilmington, Del. -- with dispersed development outside of the urban core, high growth in vehicle-miles traveled (VMT), and industry that has almost exhausted itself of the "easier" emissions reductions -- is fairly typical of many metropolitan areas. The Wilmington Metropolitan Area Planning Council (WILMAPCO) has developed a number of emission-control strategies to be used in the region's next transportation improvement program. In addition to availing itself of the Tier 2 emission-reduction credits, the area has embarked on a program centering on additional transit services, both rail and bus; turnover in the transit fleet; alternative fuel vehicles; and land-use related credits from directing growth to open urban parcels (i.e., infill development).

Wilmington's big brother to the south, Baltimore, has also reserved a considerable portion of its program for emission-reduction strategies. In fact, the metropolitan

planning organization is creating a mitigation-strategies subcommittee, which will be devoted solely to investigating other available emission-control measures and assessing their benefits to the Baltimore region. More in line with the short term, the region's 2000 Transportation Improvement Program (TIP) includes the "College 33 Pass Program," a measure offering reduced transit fares to students attending the region's 33 colleges and universities. Telecommuting will also play a role in Baltimore's conformity efforts as the metropolitan planning organization encourages more workers to use this popular and growing option.

Efforts also have been recorded at the state level. Pennsylvania has created a new multijurisdictional, multidisciplinary working group to tackle the many challenges faced by the state with transportation conformity and ozone attainment. Because the state runs the full gamut from rural nonattainment areas to densely populated Philadelphia, the new working group is extremely dynamic, covering the entire transportation-air quality arena. Starting on Dec. 1, 1999, representatives of local transportation organizations, the state environmental agency, and the Pennsylvania Department of Transportation have been meeting quarterly with their federal government partners and private sector partners.

### **A New Transportation Conformity Reference Guide**

On July 11, the Federal Highway Administration (FHWA) released the Transportation Conformity Reference Guide, a 453-page tool intended to help state and local agencies comply with the Clean Air Act Amendments (CAAA) of 1990. The guide was prepared by FHWA and the Federal Transit Administration (FTA), in cooperation with the Environmental Protection Agency and a diverse group of stakeholders.

The need for a reference guide stems from the requirement to integrate transportation and air quality planning -- a requirement included in the CAAA of 1990, the Intermodal Surface Transportation Efficiency Act of 1991, and the Transportation Equity Act for the 21st Century.

The guide is designed for both seasoned practitioners and newcomers to the transportation conformity process. Relevant materials and information needed by agencies to understand transportation conformity are included in an accessible and easy-to-read format.

The guide can be viewed or downloaded from the FHWA Web site at <http://www.fhwa.dot.gov/environment/conform.htm>. The guide on the Web will be updated periodically to

include new information, guidance, court rulings, case studies, research findings, or approaches to meeting transportation conformity requirements. It is a reference manual and contains transportation conformity rules and relevant preamble language, questions and answers, and resource materials. The guide on CD-ROM may be obtained from the FHWA division office in each state, the FHWA resource centers, FTA regional offices, state departments of transportation, and metropolitan planning organizations.

## Outlook

Air quality in the United States is better than at any time since well before the passage of the Clean Air Act. In addition, despite economic expansion, a growing suburban population, and the associated consistent rise in VMT still in the forecast, emissions are projected to stay on their downward track for years to come. If or when emissions from highway transportation turn up again is largely dependent on future technology and, to some extent, on our behavior as travelers.

Data from EPA's *National Air Quality and Emissions Trends Report 1998* indicates a drop in ozone concentrations of 30 percent between 1978 and 1997. In addition, carbon monoxide (CO), a persistent air quality problem for most of the 20th century, declined another 60 percent during the same period. Transportation sources, specifically, also have fared well, as on-road hydrocarbons dropped 37 percent between 1988 and 1997 and NO<sub>x</sub> emissions from highway vehicles fell 8 percent since their 1994 peak.

While these drops in overall emissions and in concentrations appear encouraging from the public health standpoint, the regulatory outlook may not be cause for such celebration. Although EPA's implementation of the new National Ambient Air Quality Standards is shrouded in legal uncertainty, the agency is proceeding with the process to designate the areas that have failed to meet the 0.08-ppm ozone standard as nonattainment areas. Consequently, the country may soon find itself with an estimated 300 additional nonattainment counties.

As for today's nonattainment areas as designated by the older, one-hour, 0.12-ppm standard, these totals also may experience an abrupt rise. In anticipation of the controlling effects of the more stringent, new ozone standard, EPA took major steps beginning in 1998 to revoke the old standard, leaving many areas in attainment and directing their planning efforts toward the new standard.

Last year's court action that remanded the stronger 0.08-ppm standard placed these areas in a regulatory limbo. While the areas never developed maintenance plans for the old standard, the new one was rendered unenforceable. Citing this dilemma, the agency announced plans in December to rescind its own revocation and bring the one-hour standard -- and nonattainment -- back to the almost 50 areas that enjoyed a brief period of attainment.

Americans love mobility. We love to be able to go where we want and when we want, and that propensity for travel is expected to keep the country's VMT count on an upward curve. Available traffic data indicate that growth trends hover between 2 and 3 percent nationally, and these estimates vary widely among major metropolitan areas. Spiraling VMT growth has been offset for a generation by cleaner cars. In addition, the implementation of Tier 2 in 2004 should generate fleet-turnover benefits for another 20 years in most areas, but the distant prospects for ever cleaner cars is problematic. Electric vehicles, natural gas engines, and hybrid designs using fuel-cell technology are working technologies that hold much promise, but marketable, cost-effective designs are still somewhat out of reach.

The outlook for transportation and air quality is uncertain. New and reachable vehicle standards, cleaner engines, and fuel technologies provide much room for optimism, and advances in modeling techniques may help develop better forecasts of the future. However, the prospect of widespread ozone nonattainment via the new standards is not a happy one for our many rural areas that are ill-equipped to handle the technical analysis that the conformity process may require.

Transportation has continued to provide its share of emissions reductions. Emissions from highway mobile sources have fallen dramatically. However, the extension of such major reductions in the face of growing travel activity defines the very formidable challenge facing transportation and air quality professionals in this new

century.

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**Michael Koontz** is an air quality specialist in the Federal Highway Administration's (FHWA's) Eastern Resource Center in Baltimore, Md. From 1994 to the restructuring of FHWA in 1999, he worked in the Environmental Analysis Division, and from 1992 to 1994, he served at FHWA's Maryland Division Office. Prior to then, he worked for the Department of Defense as a transportation systems analyst and as a regional geographer, specializing in logistics and intermodal developments in the Middle East and North Africa. Before government service, he worked as a business location planner and as a land-use consultant in the private sector. He has a bachelor's degree in geography and environmental planning, and he earned a master's degree in transportation geography from Towson State University in Baltimore.

*See Michael Koontz's previous article, "Clean Air and Transportation: The Facts May Surprise You," in the July/August 1998 issue of Public Roads, which is available on the Web in the Public Roads archives at [www.tfsrc.gov](http://www.tfsrc.gov).*