

# Linking Transportation and Air Quality Planning:

Implementation of the Transportation  
Conformity Regulations in 15  
Nonattainment Areas

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U.S. Environmental Protection Agency  
and the  
Federal Highway Administration,  
U.S. Department of Transportation

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AIR QUALITY PLANNING:  
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IN 15 NONATTAINMENT AREAS**

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*A Report to the  
U.S. Environmental Protection Agency  
and the  
Federal Highway Administration,  
U.S. Department of Transportation*

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*Executive Summary*

**LINKING TRANSPORTATION AND AIR QUALITY PLANNING:  
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**CHAPTER 1: THE CONFORMITY ASSESSMENT PROJECT**

The Clean Air Act Amendments (CAAA) of 1990 require far-reaching efforts under the “transportation conformity” regulations to assure that transportation investments in nonattainment and maintenance areas are consistent with state commitments to meet national air pollution standards. This research documents how these regulations were implemented during the period 1991 through January 1998.

**Focal Questions.** Three questions have organized the study:

- How has conformity affected key agencies and constituencies’ organizational capacity and relationships?
- How has conformity changed the transportation planning/programming process and its results?
- How has conformity changed air quality planning and regulation?

Although the research does not attempt to evaluate the technical dimension of conformity modeling, it seeks to place the technical process in the larger context of the institutional relationships involved.

**Study Sites.** The researchers chose a non-random sample of 15 nonattainment areas – Atlanta, Baltimore, Boston, Charlotte, Chicago, Denver, Houston, Milwaukee, New York, Northern New Jersey, Philadelphia, Phoenix, Portland, Salt Lake City, and San Francisco – to concentrate on large metropolitan areas with more severe air pollution problems. The sample does not include rural nonattainment areas, small metropolitan areas, or areas with minimal pollution problems.

In each area, the researchers consulted documents and publications and conducted personal interviews. In all, they spoke with more than 230 individuals knowledgeable about conformity, including representatives from MPOs, state air agencies, state DOTs, EPA and FHWA field offices, environmental advocacy groups, and other stakeholders.

## **CHAPTER 2: THE PURPOSES AND REQUIREMENTS OF TRANSPORTATION CONFORMITY**

The conformity process is intended to ensure that a nonattainment (or maintenance) area will keep transportation-related emissions within the bounds needed to bring the state into compliance with (or maintain) the national ambient air quality standards – and thus to advance the public health goals of the Clean Air Act. But the statute and the regulations promulgated by EPA to implement them imply a broader set of purposes, and stakeholder groups have layered on additional expectations about how conformity would work. These extended purposes and expectations include:

- establishment of a procedural framework and incentives for analyzing transportation-related pollution,
- improvements in both transportation and air planning processes and establishment of tighter connections between them,
- improvements in public deliberation and decisions on transportation and air quality issues, and
- promotion of elements of the environmental advocacy agenda.

## **CHAPTER 3: IMPLEMENTING THE TRANSPORTATION CONFORMITY REQUIREMENTS**

During the study period, each of the 15 study sites experienced at least some difficulty with the technical and procedural requirements of the 1993 transportation conformity regulations. These problems are considered in six categories: (1) **Emission tests:** passing the emission budget and build/no-build tests, (2) **Modeling procedures:** fulfilling the transportation modeling requirements, (3) **TCM implementation:** demonstrating timely implementation of those transportation control measures committed to in control strategy SIPs and maintenance plans, (4) **Fiscal constraint:** showing that the transportation plan meets the ISTEA fiscal constraint requirement, (5) **SIP failure:** triggering conformity problems because of problems with SIP submissions, and (6) **Human error:** experiencing conformity problems because of procedural confusion and/or data analysis mistakes.

The nature and consequences of these problems for the transportation planning process and air quality regulation varied significantly. (See Table 3-2 in the body of the report for the problems encountered by each nonattainment area.) In applying the specific emission tests of the 1993 regulations, five study sites encountered significant difficulties with the budget tests, which continued to pose serious problems for Atlanta, Charlotte, and Houston at the end of the study period in January 1998. The build/no-build test was problematic for even more areas, but the difficulties were less severe – and, because this requirement was substantially altered by the 1997 conformity amendments, the problem has become moot in most areas. No study area reported difficulty with the less-than-1990 test.

The other conformity requirements were generally less problematic than the emission tests. While a number of study sites had some difficulties gearing up for the network modeling requirements of the 1993 regulations, only New York City and Chicago faced serious conformity delays as a result.

The fiscal constraint requirement posed no serious problems for any areas, although Boston experienced a brief conformity delay because of this test. Initially, the provisions of the 1993 rule regarding SIP failures caused problems for a few areas; but the 1995 conformity amendments alleviated this issue. During the study period, only Salt Lake City suffered a conformity freeze or lapse because of SIP failure.

## **CHAPTER 4: INSTITUTIONAL ROLES IN THE TRANSPORTATION CONFORMITY PROCESS**

Fulfilling the purposes of conformity depends crucially on creating stronger institutional links between two sets of agencies – transportation and air quality – that operated quite independently of each other prior to enactment of the CAAA of 1990.

**Contextual Conditions.** For the core regional and state agencies involved in conformity – particularly MPOs, state and regional air agencies, and state DOTs – implementation of the conformity regulations created significant stresses, not merely in terms of what conformity itself required but also in the context of broader changes stemming from the CAAA and ISTEA. Even without the conformity requirements, air quality and transportation agencies faced substantial increases in workload as well as the need to develop new skills and to build relationships with other agencies.

**Developing Technical Capacity.** Conformity made significant start-up demands on MPO technical capacity and resources. Of the 15 study sites, New York City and Chicago had the most difficult experiences. Most of the MPOs in the study were subject to the network modeling requirements of the 1993 conformity regulations, and all needed to upgrade their modeling capabilities to meet the general requirements of conformity. Typically, MPOs had to hire additional in-house technical staff and/or consultants for this purpose. While conformity was often the decisive factor, these upgrades were also motivated by ISTEA's planning requirements and the provision of federal funds to strengthen planning capabilities.

For state air agencies developing necessary technical resources was also challenging. To meet a spate of new responsibilities under the Clean Air Act, including conformity, most air agencies hired additional staff members who had or could develop transportation expertise, but this took time; and new staff had to be assimilated to new institutional practices and cultures. By contrast with both air agencies and MPOs, state DOTs faced far less conformity-related pressure for technical capacity enhancement.

Both the U.S. Environmental Protection Agency and the U.S. Department of Transportation significantly contributed to the development of organizational capacity for conformity by providing technical assistance to state and regional agencies.

**Establishing Interagency Consultation Procedures.** The conformity regulations emphasized the need for effective interagency consultation at each stage of the conformity process. Consultation practices have emerged gradually as first the 1991 interim conformity guidelines and then the 1993 regulations have been implemented.

As a result of start-up challenges, many areas missed the window of opportunity for consultation that could have informed the first set of SIPs in the CAAA/ISTEA era. In a few areas, such as Boston, Houston, and Milwaukee, broad-based SIP planning task forces were established.

However, transportation planners in some other areas were not sufficiently aware of the importance of their involvement in SIP planning. Thus, emission budgets were derived implicitly from SIP inventories without enough consideration of their implications for future conformity determinations. Likewise, during the start-up phase, air planners were just beginning to establish their role in transportation planning and frequently felt that they had too little influence on the first post-ISTEA round of transportation plans and TIPs.

Typically led by the air agency, concerned agencies in most states began working on conformity SIPs in 1994. Many states finished work essentially within the allotted year, building on the experience gained in their initial conformity experiences. Most developed interagency consultation procedures with little disagreement, and a number regarded the exercise of specifying responsibilities and defining processes as quite useful in clarifying expectations about how conformity would be carried out. To accommodate forthcoming amendments to the conformity regulation, however, EPA moved the deadline for completed conformity SIPs into 1998. Conformity SIPs were therefore not complete in many areas at the conclusion of the study period in January 1998.

**Consultation in Practice.** Whatever the legal status of their conformity SIPs, though, the study areas have developed interagency consultation practices that go well beyond previous levels of interaction. Formal consultation goes beyond the mechanics of conformity in most, but not all, areas. Air agencies now typically participate in some fashion on the MPO committees where transportation decisions are made, so they have an opportunity to make suggestions or raise issues at a formative stage of policy development. Official interactions, however, tell only part of the story of interagency consultation. *Formal* consultation procedures have frequently helped to foster stronger *informal* working relationships and deeper understanding of the issues in a number of areas.

Many of the state and regional officials interviewed for the study stressed that, as a result of the formal and informal relationships that conformity has spurred, they have developed a much greater understanding of their counterparts' challenges and the constraints that shape their policy approaches. This makes it far easier to acknowledge problems and work together to solve them. Consultative relationships, once initiated, therefore tend to become reinforcing.

In some areas, however, consultation is relatively limited and focused to a great degree on formal interactions such as committee meetings, review of proposed conformity determinations by air quality planners, and comments by transportation planners on proposed SIP budgets or mobile source control measures.

Even in areas where strong consultative relationships have developed, important limitations remain. Where close interagency relationships develop, they do not transcend or submerge distinct institutional interests and perspectives in conformity. Nor do they fundamentally change disparities of bureaucratic or political power. Agency personnel continue to represent their own agencies and may not always be able to find common ground with their colleagues on specific matters. As a result, while state air agencies provide important technical inputs to conformity analysis in a number of study sites, they have generally been *reactive* rather than proactive participants in conformity. Resource limitations and the opportunity costs of using this scarce capacity for conformity are a major barrier. Because a number of air agencies have little in-house technical expertise on transportation demand modeling, they are uncomfortable probing that dimension of conformity even when they have serious reservations about how the MPO is handling it. Perceived political weakness of air agencies relative

to transportation counterparts is another barrier. In only a few instances identified in the study sites have air agencies been aligned against transportation agency positions in major conformity disputes.

**Federal Agency Roles.** The conformity regulations give DOT the final authority to decide whether an MPO's conformity determination should be approved. In practice, FHWA has taken the lead in this review, working closely with EPA and FTA. The federal agencies also consider comments from interested stakeholders (most often environmental advocacy groups). Serious objections from a key stakeholder typically trigger intensive review of the MPO's conformity analysis.

FHWA has generally worked with FTA and EPA to reach consensus on a federal position, sometimes managing discussions at multiple levels of the agencies. In only one instance in the study sites – Atlanta – has there been severe disagreement between DOT and EPA.

In each state in the study, FHWA has division offices in the same city in which the state DOT headquarters is located. Therefore, its air quality staff members generally have direct access to their counterparts in state and regional agencies and often provide technical assistance and advice.

EPA field staff, operating from only ten regional offices, do not have comparable access in many instances. They have nonetheless played active roles in implementing conformity – providing technical assistance, troubleshooting on major issues, advising and consulting with national headquarters staff, working with states and MPOs to develop conformity SIPs, and dealing with the conformity consequences of control strategy SIP revisions or disapprovals. However, EPA's involvement in conformity at the MPO/nonattainment area level has been significantly more variable, and weaker overall, than FHWA's – to a great degree because EPA lacks a state-level presence equivalent to FHWA's divisions.

FTA also has only regional offices, and its conformity role has generally been less extensive than either FHWA or EPA's.

At the headquarters level, FHWA staff in Washington provide technical backup, interpret agency policy, promote inter-area consistency, and manage liaison with EPA headquarters staff. EPA's mobile source headquarters staff, primarily based in Ann Arbor, Michigan, played the lead role in drafting the transportation conformity regulations and the subsequent amendments (in close consultation with DOT, whose concurrence was required by the statute). EPA headquarters has also played a continuing role in interpreting the regulations, coordinating regional office mobile source specialists to ensure national consistency, and has communicated regularly with state and regional transportation and environmental agencies and other stakeholder groups.

**Stakeholder Roles.** The conformity regulations require both that the public have opportunity to comment on conformity analyses before the determination is made and that MPOs fulfill the requirements of the DOT metropolitan planning regulations, which more generally mandate public participation in transportation planning. Using these paths of access, environmental advocacy groups have been the most active non-governmental stakeholders in conformity, playing key roles in about one third of the 15 study sites and a more limited role in most others. To track conformity well, however, is time-intensive and requires significant technical skills. To participate effectively, therefore, environmental advocates have had to make efforts that, in many respects, parallel the

involvement of personnel from the core public agencies. In several study sites, strong environmental groups that have focused on transportation issues more generally have therefore strategically chosen *not* to become actively involved in the conformity process. And not every study site has advocacy groups capable of effective participation.

Business associations are the only other stakeholder group active in conformity – and then only in a few nonattainment areas.

**The Broader Visibility of Conformity.** At least up to the conclusion of the study period – January 1998 – conformity had not generally been effective in focusing the attention of high-level appointed policy makers and elected officials on the issues of transportation and air quality. The complex and highly technical nature of the conformity process has been a barrier to expanding participation in the planning arena beyond the core group of planning and policy officials who deal with it on a regular basis.

The core public agencies have also had limited success in drawing the general public's attention to conformity. In most of the study sites, there is scant media coverage of the transportation planning process in general and conformity in particular. Unless controversy arises, conformity is an inherently difficult subject for newspapers, let alone television or radio, to report. Its highly technical nature, revolving around complex regulatory requirements and arcane modeling procedures, diminishes its accessibility to both generalist reporters and the public.

To the extent that the core agencies have attracted public attention to conformity, they have relied primarily on organizing and formally announcing public meetings, placing notices in their newsletters, and – increasingly – posting notices and technical documents on MPO websites. Consequently, very few unaffiliated citizens have availed themselves of opportunities for involvement, even when MPOs and others have exerted considerable effort to secure participation.

However, in several areas that have experienced long conformity lapses (such as Denver, Charlotte, and Atlanta) the level of media coverage has increased, including newspaper coverage that explains the policy issues as well as describes the conflict. This makes the issues more accessible to the public. Under these circumstances, moreover, senior policy makers and elected officials are also more likely to become active in trying to resolve the conformity problems.

## CHAPTER 5: CONFORMITY EFFECTS ON TRANSPORTATION AND AIR QUALITY PLANS

**Effects on Transportation Plans and Programs.** Firm conclusions about impacts of conformity on transportation plans/programs are premature because of the dynamics of transportation planning and project development. The regulations were not in effect during the *formative* years of many of the projects in transportation plans/programs that were subject to conformity during the study. In effect, the conformity regulations were applied to the *final* stages of planning. It is not surprising, therefore, that the effects of conformity have been felt more clearly in the planning *process* than in the substance of the plans themselves.

During the period in 1991-1993 that the interim conformity guidance was in effect there was considerable initial uncertainty about what this unfamiliar procedure entailed and how it had to be documented, but most MPOs experienced relatively little difficulty demonstrating conformity against this standard.

*HIGHWAY PROJECTS IN HIGH-GROWTH AREAS.* Under the 1993 regulations, as amended, conformity's impacts on highway projects have been felt primarily in a number of the high-growth areas in the study – Atlanta, Charlotte, Denver, Houston, Salt Lake City – which found passing conformity's emission budget tests problematic during the study period.

Except for Portland, the high-growth study areas tend to have substantial dispersed land development and a significantly rising level of vehicle-miles traveled (VMT). As a consequence, they typically have major highway capacity expansion plans. These areas generally have transit systems with much smaller mode shares than the typical low growth area in the study – and their growth is primarily occurring at the peripheries of the metropolitan area where providing high-quality transit service is problematic. On the air quality side, because these areas, with the exception of Houston, have less severe ozone problems than the low growth areas in the study, they have earlier attainment deadlines. Consequently, they must show required reductions, net of VMT growth, more rapidly than the lower-growth areas.

The effects of the difficulties that Atlanta, Charlotte, Denver, Houston, Salt Lake City had in passing conformity emission budget tests ranged from delays in proceeding with certain planned projects, to scaling back the design scope of others, to eliminating certain projects from proposed transportation programs. Atlanta and Charlotte were experiencing conformity lapses at the time the study concluded in January 1998.

*HIGHWAY PROJECTS IN LOWER-GROWTH AREAS.* Implementation of the conformity rule has had far less impact on transportation plans/programs in the older, relatively low growth metropolitan areas in the study – Chicago, New York, Baltimore, Boston, Philadelphia, Milwaukee, northern New Jersey, and San Francisco. Although these areas typically have more serious pollution problems, they generally have mature highway infrastructure networks, well established transit systems, and relatively slow VMT growth. As a result, many projects in their transportation plans/programs have neutral or positive air quality benefits. These projects include reconstruction and maintenance of the roadway system and most investments in transit. Thus, conformity has not required major adaptations of transportation plans in these areas because there are few major capacity expansions on the table, the mix of projects already includes many with air quality benefits, and technology measures are being adopted in the SIP.

These areas, however, have not yet met their stiffest conformity challenges. In the absence of attainment demonstrations for these areas, the emissions budgets that they have met come from 15% VOC reduction SIPs and subsequent RFP SIPs. Moreover, at the end of the study period, some had not yet determined conformity against 1999 RFP levels.

*ONGOING HIGHWAY IMPACTS.* How Charlotte and Atlanta would resolve the lapse problems noted above was not clear at the conclusion of the study period in January 1998. What these situations and other less dramatic cases in the study suggest, however, is how difficult institutionally and politically it is for MPOs and state DOTs to make changes in their transportation plans and programs. Given the difficulty of extricating projects from plans, and the length of time that will elapse before projects in the pre-ISTEA pipeline are exhausted, it is not surprising that major changes in the contents of regional transportation plans have been few.

As a result of conformity, though, it appears that proposals for major highway capacity enhancement, while not precluded, are less likely to move into preliminary planning phases than they

might have previously, if they seem likely to be “emission budget busters.” Because major highway projects may threaten *financial* as well as emission budgets, moreover, this effect is strongly reinforced by the fiscal constraint requirement of ISTEA.

*EFFECTS ON TRANSIT, OTHER TCMs, AND LAND-USE PLANNING.* Because a number of conformity stakeholders, particularly environmental advocacy groups, expected that conformity would promote specific elements of their transportation policy agendas, this study has investigated whether conformity has had an impact on transit, other transportation control measures (TCMs), and land-use planning.

In the 15 study sites, conformity considerations seem to have reinforced – but not determined – transit policies in two areas (Denver and Portland). At the end of the study period in January 1998, however, transit planning in the others had been much less affected by conformity. Contrary to the cited expectations, most rapidly growing metropolitan areas in the study, including those that have experienced conformity difficulties, had not found transit’s emission benefits sufficient grounds to encourage major investments. However, the areas that already have extensive transit networks have found the emission benefits of continued investment helpful in demonstrating conformity.

Only two areas (Boston and Baltimore) reported adopting a TCM specifically for conformity purposes. In others, the availability of CMAQ funding has probably increased the attractiveness of some TCMs relative to other possible expenditures; and several areas routinely used an off-model analysis of TCMs to pass the build/no-build test. Because most TCMs show only modest air quality benefits, however, other factors have driven their inclusion in area plans; they have not been programmed specifically to capture air quality benefits.

Some proponents of conformity hoped that modeling transportation/land use links would also lead to consideration of alternative land-use scenarios in the planning process and wider acceptance of land-use regulation as a viable policy option for reducing mobile source emissions. However, with the exception of Portland among the 15 study sites, the impact of conformity on actual land-use decision making has been limited by the distribution of institutional responsibilities and the politics of land use regulation.

**Conformity and Air Quality Planning.** During the start-up phase of CAAA/ISTEA implementation, conformity did not have a large influence on the first rounds of SIP planning, primarily because of competing statutory demands and the timing of the 1993 regulations.

As areas have moved through subsequent rounds of air quality and transportation planning, however, conformity has had more impact. In the face of conformity problems, some areas have adjusted or amended mobile source budgets. Other areas have proactively reassessed emission budgets to anticipate and deal with looming conformity problems. For example, to deal with PM<sub>10</sub> conformity problems in 1994, the Denver region established out-year budgets that increased over time, while it mitigated emissions in the downtown area to keep them within allowable limits. In 1995, Salt Lake City added ten years to its ozone maintenance plan, matching the time frame of its transportation plan, to ease problems of passing the NO<sub>x</sub> budget test for ozone. Portland proactively established out-year emission budgets in its 1996 ozone maintenance plan to make future conformity determinations less difficult.



Just as air planners have become more significant and involved stakeholders in transportation planning, transportation planners have become more active stakeholders in air planning. In most ozone nonattainment areas, they have been much more involved with the 9% and attainment year budgets than they were with the 15% VOC reduction SIPs, although in several areas (e.g., Atlanta, Philadelphia, and New York City) they did not get deeply involved in negotiations until after preliminary budgets had been set and transportation agencies had to react through comments. Overall, this involvement represents a major change in the practice of transportation and air quality planning. Even where bureaucratic relations have not been smooth, the previously separate planning and regulatory processes have become far more tightly linked than ever before.

Conformity has spurred this process in two main ways: (1) by stimulating greater scrutiny of and refinements in the current data and forecasting techniques for transportation demand, and (2) by forcing planners and policy makers to identify, confront, and more directly assess the options they have for reducing mobile source and other emissions.

The complexity of the modeling process and the inter-relationships between conformity and SIP modeling, however, have sometimes made it difficult to get to the heart of these issues. All of the areas that have had serious problems passing the budget tests (Atlanta, Charlotte, Denver, Houston, and Salt Lake City) initially responded by attempting to alter the modeling underlying mobile source emission budgets or to enlarge the mobile source share of the aggregate budget to accommodate high VMT growth rates.

Although the conformity rule does not require areas to put TCMs in the SIP, some environmentalists believed that the protection given SIP TCMs would encourage areas to do so. During the initial round of SIP planning, however, conformity proved to be a *disincentive* for inclusion of TCMs in SIPs because delay of a SIP TCM could cause a conformity lapse, jeopardizing the flow of federal funding for all transportation projects. Portland is the only study area that placed TCMs in the SIP specifically to ensure their implementation even if political opposition arose.

Some areas considered the ramifications of conformity when choosing SIP measures other than TCMs. With the notable exception of Phoenix, however, few adopted mobile source control measures that were not mandated by the CAAA. Three study areas (Chicago, Houston, and Phoenix) requested NO<sub>x</sub> waivers, at least in part to avoid problems with the conformity NO<sub>x</sub> build/no-build tests. Denver adopted air quality measures outside of the SIP to pass PM<sub>10</sub> conformity, while avoiding the hurdles of an amendment to add measures to the SIP. In Maryland, although conformity did not influence the initial form of the state inspection and maintenance (I/M) program, the governor vetoed a bill adopted by the legislature in 1997 that, by making I/M voluntary, would have resulted in EPA disapproval of the Baltimore SIP and imposition of a conformity freeze.

## CHAPTER 6: TOWARD A NEW PLANNING “ARENA”

**Planning Improvements.** The interviews conducted for this study reveal a broad professional consensus that conformity-related improvements in planning methods are genuine and valuable not only for air quality regulation but also for other planning purposes. Conformity requires transportation planners to use advanced analytic tools and the latest available planning assumptions to

forecast transportation demand and mobile source emissions. Coupled with the infusion of ISTEA funds to hire technical staff and collect more recent, often more detailed, data about demographic trends, land use, and travel behavior, conformity has thus led to significant improvements in planning capabilities in all of the study sites, though in varying degrees. Improvements in transportation planning have served not only to focus transportation planners on the goals and requirements of the Clean Air Act but also have had a direct effect on air quality planning.

**Divergent Perspectives on Regulation.** It is important to distinguish, however, between acceptance of air quality analysis for *planning* purposes as opposed to *regulatory* purposes. Conformity shapes key policy decisions, allotments of large sums of federal aid, and legal authority to proceed with projects. As a result, many transportation and air planners continue to have significant differences about how the conformity analysis is conducted and what impacts it has on the quality of decision making.

Some transportation planners resent the absolute priority that air quality goals have over all other goals in transportation planning. Many question the validity of using the model outputs for making conformity determinations, arguing that conformity conveys a false image of precision. These feelings are sometimes intensified because of inconsistencies between the planning assumptions incorporated in SIPs and those in the conformity analysis. These inconsistencies do not always make it more difficult to demonstrate conformity. If they do, though, transportation planners often express frustration that the complexities and slowness of the state regulatory and federal approval processes make it quite time consuming – and often impractical within the time frame of regular transportation planning cycles – to update SIP planning assumptions.

By contrast, many air planners and environmental advocates contend that the modeling results provide a sufficiently good approximation of current reality and future development patterns to warrant their use for conformity, especially given their view that it is critically important to achieve Clean Air Act goals. Others argue that emission models underestimate mobile source pollution, so that transportation projects get the benefit of the doubt. Some suspect that MPOs shade the transportation demand analysis to produce favorable results.

Another divergence in the perspectives of transportation and air planners results because conformity permits the modeling to take “credit” for improvements in vehicle emission control systems or beneficial changes in fuel composition only when these are mandated by federal regulations and/or adopted in legally enforceable regulations by the state. Many transportation planners and advocates regard this as an artificial feature of the planning system. They contend that it is poor policy to be forced to forgo transportation projects which would otherwise be permissible simply because the time frame of decision making on national technology policies is independent of – and therefore imperfectly synchronized with – the timing of their conformity decisions. By contrast, many air agencies and environmental advocates assert that until such controls are legally mandated, it is inappropriate for conformity to recognize still-speculative emission reductions. Once transportation projects are approved, they argue, it is difficult or impossible to halt them or scale back if emission reductions from technology measures do not materialize.

**Confronting Conformity Difficulties.** In the framework of the CAAA of 1990, conformity is an analytic “trip-wire” to alert policy makers to inconsistencies between two sets of policies – air quality planning (codified in state implementation plans) and transportation planning (codified

in transportation plans and programs). In the 15 study sites, this reconsideration tends to occur in distinct phases. First, planners carefully re-examine the modeling on which the conformity analysis is based to confirm that a problem exists and to discover its magnitude. When conformity difficulties are significant, they must then deal with the institutional and political dynamics of changing either the transportation plan/program or the applicable SIP so that conformity can be demonstrated.

Through the process of reconsidering planning assumptions and modeling techniques, the transportation agencies seek to reduce the possibility that conformity penalties might result from “technical” difficulties in the modeling rather than “real” future problems revealed by conformity forecasting of emissions. Environmental agencies, in turn, seek to discover whether the analysis has been conducted appropriately and whether genuine conformity problems exist. As a result of such scrutiny on both sides, errors have been discovered, improved estimates of key parameters have been secured, and refinements of modeling methods have been introduced.

Within the community of core conformity stakeholders – transportation and air agencies and active stakeholder groups – the character of the consultation process appears to have important consequences for the credibility and longer term effects of the analytic process. In areas with less intense interagency consultation practices, reassessment of modeling methods is likely to be performed primarily by MPO staff, sometimes with little visibility to other agencies and stakeholders. But MPO autonomy comes at a cost: reduced confidence by outsiders in the results. By contrast, when the analytic issues of conformity have been the focus of careful “upfront” discussion and debate among interested agencies and stakeholders, transportation planners are more likely to regard any remaining problems in demonstrating conformity as “real” rather than modeling artifacts; and air planners and advocacy groups are less likely to harbor suspicions that conformity has been demonstrated by technical manipulation. As successive cycles of conformity analysis are undertaken, effective interagency consultation creates greater mutual confidence in the analytic process.

The professionals, however, are not conformity’s only “audience.” Conformity was also clearly intended to get policy officials, elected executives, legislators, and a broad array of stakeholder groups to confront the *policy* dimensions and tradeoffs of transportation and air quality. Data from the 15 study sites, however, suggests that it can sometimes be problematic to move discussion of conformity problems beyond the relatively small circle of transportation and air quality professionals and the few stakeholder representatives who deal with it on a regular basis. In some of the study areas, this has led to considerable delay in confronting the roots of their conformity problems.

**Responding to Conformity Problems.** In the event of conflict between transportation plans and air quality commitments, the conformity regulations permit an MPO or state, in principle, to resolve the inconsistency by making changes to transportation plans/programs, SIPs, or both. As a practical matter, however, it has often proven more difficult to make such changes than some of the architects of conformity anticipated.

To disaggregate the final package of projects that appear in a regional transportation plan or program is politically arduous and time consuming. Many environmental advocates and air planners have been frustrated that the transportation planning/programming process has proven less pliable than they hoped or expected. This problem is exacerbated by the weak link between transportation

planning and land use regulation that exists in virtually all of the study sites, except Portland.

Seeking changes on the air quality side – i.e., in the state implementation plan – encounters other kinds of difficulties. Depending on the state, this may take many months, sometimes more than a year. To go through the SIP revision process is almost always to delay the normal schedule for developing and initiating new plans/programs. Seeking changes in a SIP is also burdensome for air planners. They often have competing priorities for time and resources, including meeting *new* SIP development responsibilities. Not unlike the political process that produces transportation plans, emission budgets usually represent consensus policies established after long periods of negotiation among stakeholders from different emission-source sectors. Reopening budget allocation decisions can ignite politically potent inter-sectoral disputes. Air planners are therefore often reluctant to manage SIP revisions.

While changing plans is difficult on both sides, it is ultimately transportation plans that are placed at risk by conformity difficulties. This was clearly intended by the legislative architects of the conformity provision of the CAAA of 1990. But it is also true that the officials with direct responsibilities for the program at risk – in MPOs and state DOTs – have direct influence over only *some* of the potential ways of resolving inconsistencies between transportation and air quality plans. To the extent, therefore, that conformity is meant to allow even-handed consideration of the *means* of resolving inconsistencies between transportation and air quality plans, the difficulties in changing SIPs and the disparities in the timing of the two planning processes is problematic.

**Conformity as an Evolving Process.** This study is a snapshot of conformity during a particular period; but like any regulatory process, conformity is evolving and responding to new situations. In addition to the issues noted, conformity must adapt to the new National Ambient Air Quality Standards for ozone and particulate matter, which will make new areas subject to regulation. New tools for analyzing transportation demand and the effects of transportation policies on pollution are in development. The impact of conformity over the long run on transportation planning/programming may be greater than it has been to date – as new plans and projects take account of conformity in their formative stages, not just as they are being finalized.

# **CHAPTER 1: THE CONFORMITY ASSESSMENT PROJECT**

## **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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and the  
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## THE CONFORMITY ASSESSMENT PROJECT

The Clean Air Act Amendments of 1990 require far-reaching efforts to assure that transportation investments in nonattainment and maintenance areas are consistent with state commitments to meet national air pollution standards. The statutory mandate was implemented through major federal regulations issued in November 1993 by the U.S. Environmental Protection Agency, with the concurrence of the U.S. Department of Transportation. Known within the transportation and air quality professional communities as the “transportation conformity” (or “conformity”) rule,<sup>1</sup> these regulatory procedures have raised the hopes of many for improvements in transportation decision making, while also motivating considerable criticism from some affected agencies and concerned stakeholders.

### Project Purposes

The research reported here, jointly initiated by the U.S. Environmental Protection Agency and the Federal Highway Administration, was planned as Phase 1 of a comprehensive Conformity Assessment Project. By carefully examining experience in 15 areas, the research will document and develop a better understanding of how the transportation conformity regulations have been implemented and

with what early effects on transportation planning and air quality regulation at the metropolitan and state levels.

The overall study was undertaken to inform and stimulate further thinking about conformity in the transportation and air quality practitioner communities. It was also intended to provide information to elected officials, stakeholder groups, and interested citizens about an important effort to coordinate and make consistent the effects of federal transportation and air pollution policies, which in the past have operated quite independently. More specifically, the research reported here was designed to discover:

- the ways in which conformity works effectively and achieves its intended ends,
- the ways in which conformity has been problematic – and why – and how areas have dealt with these problems,
- conformity challenges for the future.

Phase 1, reported on here, covers the period from 1991 through January of 1998, which includes experience under the Interim Conformity guidelines issued by EPA and DOT in 1991 and under the November 1993 conformity regulations. Phase 2 will revisit the issues of Phase 1 after several more years of experience, focusing particularly on whether and how the 1997 conformity amendments, as well as further implementation of other aspects of the 1990 CAAA, have affected how conformity works at the met-

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<sup>1</sup>All references to “conformity” in this report relate to the “transportation conformity” regulations, which apply only to highway and transit projects. The CAAA of 1990 also require “general conformity” procedures for other federal projects/actions.

ropolitan and state levels.

Although no study of conformity can ignore the technical issues of transportation and air quality modeling that are central to the practice of conformity, this research was intended to deal primarily with *institutional impacts, effects on planning process, and substantive planning outcomes*. We have inquired how the conformity modeling requirements have affected institutional development in the study sites and how the modeling process and results have shaped the conformity decision-making. It should be carefully noted, however, that the study was not designed to provide a careful examination, let alone an evaluation, of modeling practices in each study site, nor to assess more generally the technical dimensions of the conformity process. Conclusions about the technical dimensions of transportation and air quality modeling are beyond the scope of this research.

## Focal Questions

Three overarching questions have organized this research:

**(1) How has conformity affected key agencies and constituencies' organizational capacity and relationships?** Conformity tests organizational capacity in at least two ways. First, it makes *technical and analytic* demands on involved agencies and stakeholder groups. The core public agencies responsible for the analysis need not only computer modeling proficiency to forecast regional transportation patterns and associated pollution but also the capacity to evaluate the forecasts and help

policy makers understand their implications. Other agencies and stakeholders that do not themselves perform modeling tasks nonetheless require sufficient technical sophistication to assess the process and evaluate policy options and impacts. Second, through the interagency consultation process, conformity requires the development of *institutional relationships* that did not previously exist in most locales. Conformity seeks to coordinate transportation and air quality – formerly nearly independent policy systems – and foster collaboration among agencies and constituency groups that historically have had very different perspectives. In some jurisdictions, indeed, these stakeholders viewed each other with deep suspicion or had clashed on policy matters. This cooperation was supposed to occur in the larger context of the ISTEA-mandated transportation planning process, which involves many planning factors other than air quality conformity.

Recognizing these demands, the research looked closely at institutional issues. How well have agencies and stakeholders coped with and adapted to the technical and coordination requirements of conformity? Did they have sufficient resources to manage its demands, or did they have to upgrade their organizational capacity and build new relationships? What positive practices have developed? What problems have arisen – and why?

**(2) How has conformity changed the transportation planning/programming process and its results?** Conformity places new demands on the transportation planning and programming process, in conjunction with elements of ISTEA that mandate broader par-

ticipation in planning and fiscal constraint of plans. Planners and decision makers in nonattainment areas must give air quality a far more prominent place in their considerations. In the face of potential financial penalties and restrictions on their ability to proceed with new transportation projects, they must assure that their policies and investment choices – assessed over a 20-year time horizon – are consistent with commitments made by their state to reduce pollution levels.

The research therefore asked how transportation planners and policy makers have adapted their previous practices to fulfill the obligations of the conformity regulations. It explored the organization of the transportation planning process, patterns of participation and interagency coordination, specific roles played by different types of agencies and stakeholders, and whether and how the outcomes of the planning/programming process were materially changed by conformity requirements. The research looked both for notable conformity-related innovations in the conduct of transportation planning and for problems and dilemmas created for planners and policy officials by the 1993 conformity regulations.

**(3) How has conformity changed air quality planning and regulation?** The conformity regulations seek to assure that decisions made in transportation policy are consistent with the requirements of the Clean Air Act Amendments of 1990 and with the specific planning and regulatory actions that each state is taking to reduce pollution to the levels mandated by the CAAA. In making this connection, however, the regulations anticipate that issues that arise in transportation planning will in turn affect the choices that state officials

make in pursuing air quality goals.

The study therefore inquired how transportation conformity has affected air quality planning and regulation. Specifically, it inquired whether and how conformity has affected civic debate about transportation goals and their interaction with air quality goals, whether conformity has affected the emission budgets developed in State Implementation Plans under the CAAA of 1990, and whether conformity has affected the inclusion of transportation control measures (TCMs) and other mobile source controls in SIPs.

## Selection of the Research Sites

To ground the study in the realities of actual practice and to gather data, the researchers, in consultation with staff in the Environmental Protection Agency and the Federal Highway Administration, selected 15 nonattainment areas for careful study. (See Figure 1-1.) Ten of the selected areas – marked by an asterisk below – had been studied by one of the researchers in a previous project (1992-1994) conducted on behalf of EPA and FHWA. The earlier research had more generally investigated implementation of the transportation provisions of the CAAA of 1990 and the air quality provisions of ISTEA.<sup>2</sup> Five additional areas were

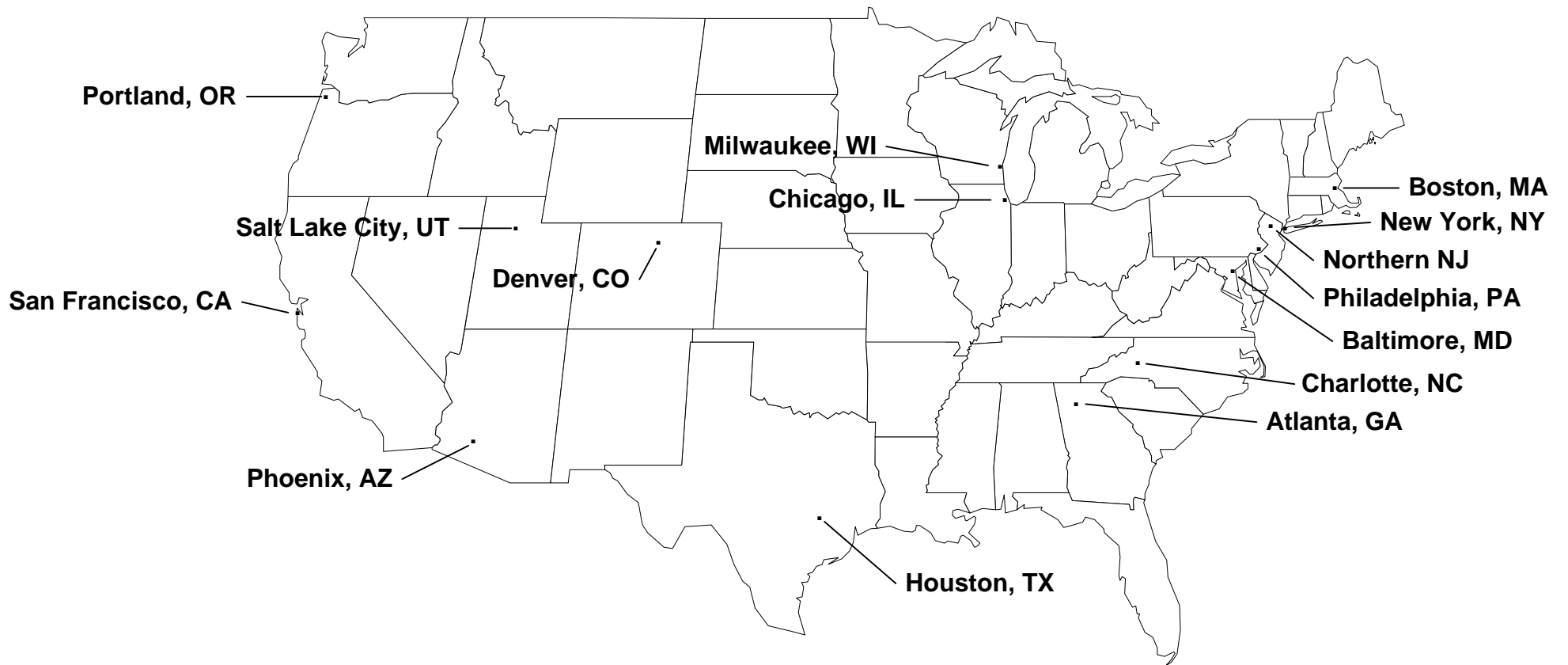
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<sup>2</sup>For results of that study, see Arnold M. Howitt, Joshua P. Anderson, and Alan Altshuler, *The New Politics of Transportation and Clean Air* (Cambridge, MA: Harvard University, John F. Kennedy School of Government, Taubman Center for State and Local Government, November 1984; also published by the U.S. Department of Transportation, Federal Highway Administration, FHWA-PD-97-010, DOT-VNTSC-FHWA-97-5, February 1997); and Joshua P. Anderson



Figure 1-1

## Nonattainment Areas in the Study



selected for the current study specifically because they were perceived by the federal agencies or the researchers to have had “interesting” conformity experiences that warranted examination. The 15 nonattainment areas selected for this research are:

- Atlanta, Georgia,\*
- Baltimore, Maryland,\*
- Boston, Massachusetts,\*
- Charlotte, North Carolina,\*
- Chicago, Illinois,\*
- Denver, Colorado,
- Houston, Texas,\*
- Milwaukee, Wisconsin,\*
- New York, New York
- Northern New Jersey
- Philadelphia, Pennsylvania,\*
- Phoenix, Arizona,\*
- Portland, Oregon,
- Salt Lake City, Utah\*
- San Francisco, California

Table 1-1 provides information about population growth and auto usage in these 15 study sites.

The selected areas were *not* meant to constitute – nor are they – a random sample of nonattainment areas subject to the 1993 conformity rule. Instead, they were selected to

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and Arnold M. Howitt, “Clean Air Act: SIPs, Sanctions, and Conformity,” *Transportation Quarterly* (Summer 1995).

concentrate on *large metropolitan areas with more severe air pollution problems* (with a primary, but not exclusive, emphasis on ozone). As shown in Table 1-2, 13 of the selected areas were classified at least “moderate” for ozone, and 10 of these were in nonattainment status for at least one other pollutant. In addition, Denver (transitional for ozone) was a “moderate 2” area for carbon monoxide and “moderate” for particulate matter, while Portland (marginal for ozone) was also a “moderate 1” area for carbon monoxide. (Some of these areas have subsequently been reclassified, as is also indicated in Table 1-2.) Beyond these criteria, the researchers sought to assure diversity by including:

- nonattainment areas in all regions of the country;
- areas growing rapidly in population and geographic spread, as well as those that were growing much more slowly in those respects;
- areas with mature highway systems and substantial transit usage, as well as those significantly adding to their highway networks and currently having more limited transit systems.

In making these selections, the researchers and sponsors believed that this sample of 15 research sites provided a significant number of individual cases that varied in several respects potentially relevant to conformity. They felt that an intensive examination of the conformity process in these jurisdictions would shed important light on how the new regulations were being implemented in major areas, identify situations in which effective implementation strategies were being employed, and reveal

Table 1-1

## GROWTH RATES OF POPULATION AND VEHICLE MILES TRAVELED, BY STUDY SITE

NONATTAIN-MENT AREA	POPULATION						VMT				
	1980	1990	1995	Percent Annual Growth ('80- '90)	Percent Annual Growth ( '90-'95)	Percent Annual Growth ( '80-'95)	1990	1995* or 1996**		Percent Annual Growth ('90- '95 or '90-'96)	VMT Per Capita ('95 or '96) <sup>d</sup>
Atlanta	1,989,341	2,653,159	3,038,050	2.9%	2.7%	2.9%	81,472,984	105,218,456	**	4.4%	34.6
Baltimore	2,173,989	2,348,219	2,432,993	0.8%	0.7%	0.8%	49,900,000	55,900,000	*	2.3%	23.0
Boston	4,945,835	5,204,103	5,274,317	0.5%	0.3%	0.4%	59,816,200	64,412,700	**	1.2%	12.2
Charlotte	566,838	686,574	760,939	1.9%	2.1%	2.0%	14,515,000	18,442,000	*	4.9%	24.2
Chicago	7,171,420	7,332,926	7,641,329	0.2%	0.8%	0.4%	127,402,856	140,834,243	*	2.0%	18.4
Denver	1,618,461	1,848,319	2,085,158	1.3%	2.4%	1.7%	39,100,000	50,900,000	**	4.5%	24.4
Houston	3,118,480	3,731,029	4,164,393	1.8%	2.2%	2.0%	90,400,000	105,800,000	*	3.2%	25.4
Milwaukee	1,693,289	1,735,364	1,780,769	0.2%	0.5%	0.3%	33,072,000	35,900,000	*	1.7%	20.2
No. New Jersey	4,961,510	5,108,929	5,243,598	0.3%	0.5%	0.4%	125,153,923	129,352,902 <sup>a</sup>	**	0.6% <sup>b</sup>	24.7
New York	11,063,184	11,379,764	11,462,260	0.3%	0.1%	0.2%	133,577,052	132,284,161	*	-0.2% <sup>c</sup>	11.5
Philadelphia	3,682,450	3,728,991	3,731,703	0.1%	0.0%	0.1%	64,565,000	70,195,000	**	1.4%	18.8
Phoenix	1,600,093	2,238,498	2,563,582	3.4%	2.7%	3.2%	49,600,000	57,000,000	*	2.8%	22.2
Portland	1,050,418	1,174,291	1,300,729	1.1%	2.1%	1.4%	20,413,000	22,437,000	*	1.9%	17.2
Salt Lake City	765,606	913,897	1,023,765	1.8%	2.3%	2.0%	20,130,479	25,864,357	**	4.3%	25.3
San Francisco	5,179,759	6,020,147	6,302,933	1.5%	0.9%	1.3%	113,389,000	123,666,900	*	1.8%	19.6

<sup>a</sup> 1999 VMT.<sup>b</sup> 1990-1999.<sup>c</sup> NYMTC does not regard negative VMT growth in this period as indicative of future trends.<sup>d</sup> 1996 per capita rates are calculated using 1995 population.

Table 1-2  
**Nonattainment Classifications for Study Sites by Pollutant**

NONATTAINMENT AREA	1990 OZONE	1990 CARBON MONOXIDE	1990 PM-10
<b>Atlanta</b>	Serious		
<b>Baltimore</b>	Severe 1	Moderate 2 Redesignated to Attainment 1995	
<b>Boston</b>	Serious	Moderate 2 Redesignated to Attainment 1996	
<b>Charlotte</b>	Moderate Redesignated to Attainment 1995	Not Classified Redesignated to Attainment 1995	
<b>Chicago</b>	Severe 2		Moderate
<b>Denver</b>	Transitional	Moderate 2 Reclassified to Serious 1997	Moderate
<b>Houston</b>	Severe 2		
<b>Milwaukee</b>	Severe 2		
<b>Northern New Jersey</b>	Severe 2	Moderate 2	
<b>New York</b>	Severe 2	Moderate 2	Moderate
<b>Philadelphia</b>	Severe 1	Moderate 1 Redesignated to Attainment 1996	
<b>Phoenix</b>	Moderate Reclassified to Serious 1997	Moderate 1 Reclassified to Serious 1996	Moderate Reclassified to Serious 1996
<b>Portland</b>	Marginal Redesignated to Attainment 1997	Moderate 1 Redesignated to Attainment 1997	
<b>Salt Lake City</b>	Moderate Redesignated to Attainment 1997	Not Classified	Moderate
<b>San Francisco</b>	Moderate Redesignated to Attainment 1995; Proposed Reclassification to Nonattainment 1997	Moderate 1 Redesignated to Attainment 1998	

problems that had emerged from this experience. It is worth noting, however, that the sample does not include rural nonattainment areas, small metropolitan areas, or areas with minimal pollution problems. So the research findings should be interpreted cautiously if interest focuses particularly on such areas.

## Research Methods and Data

Data for this study was collected primarily during the period from fall 1996 through spring 1998, with some additional work conducted until February 1999. In the course of the project, the researchers gathered and assessed several types of information about the 15 study sites:

- Background data was compiled on all study areas, including official documents prepared in the course of their air quality and transportation planning, local newspaper reporting (primarily identified through NEXIS searches), articles in national newsletters,<sup>3</sup> *Federal Register* notices and regulations pertaining to each area, selected documents from EPA and FHWA files, and other materials provided by interview subjects.
- In ten of the nonattainment areas, the researchers consulted records of their interviews (primarily with staff members of MPOs, air agencies, and state DOTs) conducted for the earlier Harvard study during the period from the

fall of 1993 through early 1996.<sup>4</sup>

- In each of the 15 study sites, new personal interviews were conducted with between 11 and 23 individuals knowledgeable about conformity. In all areas, interview subjects included representatives from the MPO, state air agency, state DOT, EPA and FHWA field offices, and environmental advocacy groups. In some areas, interviews were also conducted with state legislative staff, regional or local air agency officials, representatives of other stakeholder groups (primarily business associations), and other knowledgeable observers. In all, the researchers spoke with more than 230 people involved with conformity in the 15 study sites.<sup>5</sup>

Interviews were conducted using *semi-structured, elite* interview techniques. In other words, the researchers did not conduct a survey with a fixed set of questions asked of each subject and then tabulate the results. Instead, the interviews began with a set of basic questions that were adapted – often extensively – for each subject to take account of the locale,

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<sup>4</sup>Information had been collected in person in Boston, Chicago, Houston, and Salt Lake City and by telephone in the remaining six sites.

<sup>5</sup>During the conformity study, the researchers visited seven research sites – Boston, Denver, New York, Northern New Jersey, Portland, San Francisco, and Salt Lake City. Telephone interviews supplemented in-person interviews in these sites. In the remaining research areas, all interviews were conducted by telephone. The typical interview was one hour in length, with the range approximately a half hour to about three hours. A large majority of the interviews were conducted with individual respondents, but some interviews involved two or more respondents at the same time.

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<sup>3</sup>These included, particularly, *Clean Air Report*, *Mobile Source Report*, *Links*, and *Transportation and Clean Air Report*.

the institutional and professional perspectives to which that respondent could speak, and the specific experiences that each respondent had had with conformity. As a particular interview unfolded, the researchers frequently asked questions and explored issues that during their preparations they had not anticipated covering with that subject.

Most information was provided by respondents on the record, but occasionally specific comments were provided on a not-for-attribution or background basis. All of the respondents agreed to allow us to cite their names as sources for the study. Most respondents were familiar with only one research site, but a few (generally federal agency officials or representatives of national environmental advocacy organizations) were knowledgeable about more than one.

Since no interview was exactly the same as any other, this research method precludes tabulation and quantitative analysis of responses to particular interview questions. On the other hand, the researchers were provided with rich, detailed descriptions of the conformity process in each research site, described from a variety of perspectives. Our respondents provided specific accounts of events and institutional relationships in their own locales and shared their insights and evaluative judgments about how conformity is working.

Once this information was compiled, the researchers conducted an intensive within-site and cross-site analysis, seeking to understand the conformity process and the relationships it has created. The findings, generalizations, and conclusions reported here are based on the 15

nonattainment areas in which research was conducted, but the research was sufficiently broadly based to generate plausible hypotheses about what might have been discovered in a more inclusive examination of conformity implementation in major metropolitan areas.

## The Research in Perspective

The value of this research thus lies in its description and interpretation of the working experience of 15 major nonattainment areas with this important regulatory mandate. The data available is rich enough to provide a nuanced perspective on institutional relationships in specific areas and to judge whether the experience of individual areas reflects common experiences or special circumstances. The time period investigated is long enough that difficulties associated with the conformity “start-up” can be placed in the perspective of a few more years of experience during which agency working relationships have been established and new analytic procedures have become more familiar. Some early problems have been surmounted, some have not, while other issues have emerged that deserve future study and analysis.

Although this research does not attempt to evaluate the technical dimension of conformity modeling, it seeks to place the technical process in the larger context of the institutional relationships involved, which more technically-oriented research rarely does in any detail.

Any full assessment of conformity, however, is bound to be provisional at this time. By

its nature, conformity's influence must be judged in a more extended time frame, as transportation and air planning processes continue to adapt, expectations and practices evolve, and investment and policy decisions are made and implemented. Since early 1998, events in several of the study sites – including Atlanta, Charlotte, and northern New Jersey – have occurred that deserve careful analysis. That is why a second phase of the Conformity Assessment Project has been planned by EPA and FHWA from the outset.

Nonetheless, the regulatory process does not stand still awaiting formal policy evaluations. Amendments to the regulations and changes in state and regional practice have been made – and may be made again – in light of experience. Even provisional information, systematically collected and assessed, can be extremely valuable. In presenting the findings of this report, the researchers have sought to provide sufficient information about the research sites to allow readers of this report to assess the interpretations and conclusions for themselves. It is therefore hoped that both the data and the findings will prove useful in ongoing policy discussions about conformity at the metropolitan, state, and national levels.

## Outline of the Report

- Chapter 2 examines the purposes and requirements of the transportation conformity regulations. Following a short history of efforts prior to the CAAA of 1990 to coordinate transportation investments and air quality regulation, it analyzes the purposes of the conformity regulations as derived both from the statute and regulations and from a broader set of stakeholder expectations. It also describes what the 1993 regulations require of transportation planners and other stakeholders.
- Chapter 3 provides an overview of how the conformity regulations have been applied in the 15 study sites and what difficulties were experienced by each area in applying the several conformity tests.
- Chapter 4 examines how conformity has connected transportation and air quality planning, concentrating on institutional and process issues. It focuses initially on the institutional context in which the 1993 regulations were implemented. Then it explores the roles played by different types of participants – MPOs, state air agencies, state transportation agencies, the federal agencies, and environmental and business stakeholders – as conformity has become an integral part of transportation planning. Finally, it assesses the extent to which conformity has led to the attentiveness and involvement of elected officials and the general public in transportation and air quality issues.
- Chapter 5 explores the impacts of conformity on the substance of both transportation and air quality plans in the study sites. It asks whether the practice of conformity has modified decisions about highway projects, transit, other TCMs, and land use policies. It also

examines whether, in turn, conformity has led to changes in air quality planning.

- Chapter 6 reviews the major findings of the report, assessing the extent to which conformity has created a new “planning arena” that genuinely links transportation and air planning.
- Following the body of the report, an appendix provides capsule histories of the conformity experiences of each of the 15 study sites.
- Another appendix identifies the interview respondents whose accounts and observations form the key source of project data in each study site.
- Additional appendices provide a glossary, identify the sources of population and transportation data for the study sites, and provide information about the authors.



## **CHAPTER 2: THE PURPOSES AND REQUIREMENTS OF TRANSPORTATION CONFORMITY**

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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## **THE PURPOSES AND REQUIREMENTS OF TRANSPORTATION CONFORMITY**

What is conformity intended to accomplish? By what regulatory mechanisms does it seek these objectives? This chapter sets the conformity process derived from the CAAA of 1990 in context by briefly examining the development of federal environmental controls on transportation planning and investment. It then examines the purposes of conformity and the broader climate of expectations that the regulations have engendered among stakeholders. Finally, the chapter examines in depth the specific requirements of conformity as laid out in the statute, the 1993 regulations, and subsequent amendments to those regulations.

### **Policy Antecedents**

Environmental advocacy groups were the leading proponents of the conformity provision of the Clean Air Act Amendments of 1990. Their efforts to see such a requirement included in the law stemmed to a great degree from their dissatisfaction with the effects of a series of previous federal regulatory initiatives. These initiatives, beginning in 1969, sought to assess the environmental effects of specific road-building proposals prior to allowing construction and, more generally, to promote transportation policies contributing to achievement of the nation's environmental goals. From the perspective of environmental advocates, these policies fell short of these objectives, leading the legislative architects of the CAAA of 1990 to craft stronger requirements.

The National Environmental Policy Act (NEPA) of 1969 created a regulatory tool – environmental impact analysis – to ensure that the potential environmental consequences of development projects, including road-building proposals, would be considered in decision making. From the environmental perspective, however, NEPA had two significant drawbacks. First, although it establishes procedural requirements for environmental analysis, the law did not provide substantive guidelines for determining which projects should proceed. Therefore, it did not prevent decision makers from moving ahead with projects that have adverse environmental impacts, as long as these were considered in the environmental analysis. Second, NEPA's project-by-project focus did not sufficiently address cumulative air quality effects – for example, how transportation projects would affect regional emissions of pollutants.

Environmentalists therefore sought a more systemic regulatory approach through successive iterations of the Clean Air Act. Early efforts to create strong links between air quality regulation and transportation planning, however, encountered many institutional problems and resistance. Until the CAAA of 1990, neither federal law nor the practices of metropolitan transportation planning provided clean air advocates and regulators with much leverage on highway or transit investments.

An initial, unsuccessful effort to connect

transportation investment policies to air quality regulation came in conjunction with the CAAA of 1970. In Section 109(j) of the Federal-Aid Highway Act of 1970, Congress required the Secretary of Transportation, in consultation with the Administrator of the Environmental Protection Agency, to issue regulations for the purpose of assuring that federally assisted highway projects would be “consistent” with the air quality plan for each pollution control area. The draft regulations became mired in disagreement between the federal agencies, however, and were not finally issued until 1975. They were extremely vague, moreover, on the crucial question of how consistency should be determined; and, to the disappointment of environmental advocates, they gave state transportation officials rather than environmental regulators the responsibility of making consistency determinations.

In most areas, EPA regional offices – politically beset, understaffed, and preoccupied with other responsibilities, including the need to develop the extremely controversial Transportation Control Plans of the early 1970s – made little effort to activate Section 109(j). Where they did, the effect was minimal. EPA’s particularly aggressive New England regional office, for example, was rebuffed by state transportation officials when it tried to claim a veto over Boston area transportation projects.<sup>1</sup> There as elsewhere, agency officials had very little training or

experience in the field of transportation. Nor were they tied into institutional and personal networks of transportation officials. This severely limited the agency’s capacity for information gathering, constructive discussion, formulation of policy alternatives, persuasion, and tactical flexibility in seeking its goals.

The 1977 CAAA contained stronger language. It prohibited metropolitan planning organizations (MPOs) from adopting a “project, program, or plan” that did not “conform” to the provisions of an approved State Implementation Plan, and it authorized the U.S. Secretary of Transportation to withhold federal highway aid upon a finding of non-conformity. FHWA was assigned responsibility to monitor compliance with the conformity requirement, in consultation with EPA. After extended negotiations, FHWA and EPA operationalized the conformity requirement in a 1978 Memo of Understanding which spelled out in general terms how consultation between transportation and air planners should occur and how the two planning processes should relate. As a practical matter, however, the conformity procedure specifically required only that states assure the timely implementation of transportation control measures they elected – at their own initiative – to include in their SIPs; and federal enforcement was weak. Consequently, the conformity requirement of the 1977 CAAA was a negligible factor in transportation investment decision making. The Secretary of Transportation never penalized a state financially for violating the conformity requirement, though environmental advocates occasionally used conformity as a litigation “hook,” most successfully to challenge transportation

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<sup>1</sup>See Mark Garrett and Martin Wachs, *Transportation Planning on Trial: The Clean Air Act and Travel Forecasting* (Thousand Oaks, CA: Sage Publications, 1996) and Arnold M. Howitt, *Managing Federalism: Studies in Intergovernmental Relations* (Washington, D.C.: CQ Press, 1983).

planning methods in the San Francisco Bay area.<sup>2</sup>

## Purposes and Expectations

The CAAA of 1990, reinforced by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, required much tighter integration of regional air quality and transportation planning than its predecessor, most notably in its invigorated transportation conformity provisions. Ultimately, pollution reduction to meet national air quality standards and achieve the resulting public health benefits, were the primary goals of these provisions. But the statute – and the regulations promulgated by EPA to implement them – implied a broader set of purposes than this ultimate goal; and various stakeholder groups layered on additional expectations about how conformity would work and what it should accomplish. These extended purposes and expectations included:

- establishment of a procedural framework and incentives for analyzing transportation-related pollution,
- improvements in both transportation and air planning processes and establishment of tighter connections between them,
- improvements in public deliberation about and decisions on transportation and air quality issues, and
- advancement of certain additional elements of the environmental advocacy agenda.

Therefore, before examining the detailed conformity requirements, it is worthwhile to discuss these goals and expectations further. Each suggests a different lens through which to view and evaluate the conformity process, as it has actually been implemented in the 15 study sites. This report will examine conformity impacts in light of this set of purposes and expectations.

### ***Pollution Reduction and Public Health***

First and foremost, the conformity process is intended to ensure that a nonattainment (or maintenance) area will keep transportation-related emissions within the bounds needed to bring the state into compliance with (or maintain) the national ambient air quality standards – and thus to advance the public health goals of the Clean Air Act. Conformity requires forecasting regional and (for certain pollutants) localized emissions from transportation. These projections, in turn, are used to determine whether expected future pollution levels jeopardize the timely achievement of the federal standards. If so, conformity provides leverage to prevent the use of federal funds for these investments.

### ***A Procedural Framework and Incentives***

Conformity is also intended to create a procedural framework and organizational incentives so that the public agencies respectively responsible for transportation and air quality policies will carefully analyze trans-

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<sup>2</sup>See Garrett and Wachs (1996).

portation-related pollution. When problems are perceived, conformity is supposed to motivate these agencies to take steps to reduce pollution, as needed, to achieve the federal standards within the deadlines of the Clean Air Act.

Procedurally, conformity relies on a *performance measurement* system, *consultation requirements*, and stiff *penalties* for failing to satisfy conformity conditions. MPOs conduct computer simulations of transportation demand, forecast the resultant emissions of controlled pollutants, and then compare the projected pollution to the permissible levels in the state implementation plan. The conformity regulations also require interagency collaboration both to frame these analyses and seek solutions to any problems revealed. It is expected that compliance will be motivated by the desire either to achieve pollution-reduction goals or to avoid interruptions in adopting or implementing transportation plans and programs. Participating agencies therefore will be inclined to develop transportation plans and programs that can pass the conformity tests or find ways to modify transportation or air quality plans to do so.

The procedural framework and incentives are expected to operate on federal agencies no less than their counterparts at the state and regional levels. US DOT and EPA field staff oversee and evaluate the technical analyses, in consultation with each other and their counterparts, to assure that federal funds are not released to finance transportation programs that undermine state efforts to comply with Clean Air Act requirements.

### ***Improving the Planning Process***

A key purpose of conformity is to upgrade the quality of both air and transportation planning and to forge strong links between these previously autonomous planning systems. On one side, conformity compels transportation agencies to make air quality a key planning factor – a criterion that is an integral part of policy assessment and that constrains emergent decisions about transportation investments. It also seeks to give air agencies a far stronger voice in the transportation planning process. On the other side, by giving transportation agencies a serious stake in air planning, conformity seeks to motivate their close involvement in developing state plans to reduce pollution.

Better integration of transportation and air quality planning over successive planning cycles, it was hoped, would improve the results of each process. As new air quality plans were developed, for example, policy makers would be motivated to re-examine mobile source emission budgets in light of the area's conformity experience to make sure that intersectoral priorities for pollution reduction were appropriate.

Part of the thrust of conformity is to enhance the analytic tools applied to transportation and air planning. To improve data and technical methods, the conformity regulations set standards for transportation demand and emission modeling, require compilation of current data, and specify how system performance must be measured. As important as these technical processes are in the conformity process, however, the mandated interagency

consultation process lies at the heart of aspirations to improve the planning system.

Effective interagency consultation is regarded as a way to assure that more and better quality information is brought to bear on transportation and air planning and to perfect the modeling and analytic capabilities of the MPO and other agencies. It also encourages mutual understanding of stakeholder values and viewpoints, promotes debate about policy alternatives, and forces the agencies to confront policy tradeoffs. In short, improving the planning process means more coordination, better deliberation, and a sharper focus on the major dimensions of choice.

### ***Public Deliberation and Decision Making***

Some stakeholders hoped that by improving planning processes, conformity would contribute to solving a major problem that arose under previous versions of the Clean Air Act – the failure to engage high level officials and the general public in serious discussion about the causal connections between transportation and air pollution and the policies that could reduce transportation emissions. Although not stated directly in the statute or regulations, some observers regarded this outcome as a logical consequence of the conformity process. By gathering information, engaging agencies in dialogue about transportation and air quality issues, and forcing them to confront conflicts between transportation plans and pollution reduction commitments, conformity would raise the public profile of these issues. Citizens would learn more about the issues,

and elected and senior policy officials would be compelled to address them.

### ***Advancing the Environmental Advocacy Agenda***

Beyond the pollution reduction goals of the Clean Air Act, many environmental advocates had firm expectations that conformity would help promote specific elements of their transportation policy agenda – purposes not necessarily shared by other conformity stakeholders. The environmentalists had long sought a regulatory lever to influence transportation planning and investment policies, particularly to discourage the financing of increased highway capacity and boost mass transit availability and convenience. Many environmentalists argue that highway capacity expansion, by improving access and reducing travel times to outlying regions of the metropolitan area, are a major cause of urban sprawl and the increasing spatial separation of jobs, residences, and shopping. In turn, they believe, low density development increases the number and length of auto trips, decreases auto occupancy rates, and diminishes the practicality of pedestrian and transit trip making. Similarly, they argue that road-building to alleviate congestion in densely developed corridors induces additional travel, since there is invariably a great deal of latent travel demand in such areas, suppressed mainly by the existing congestion. In part, this is a case for controlling air pollution. Additional auto travel, they believe, generally means more pollution (though congestion relief may temporarily reduce emissions per vehicle mile). But concerns about highway capacity also

connect to a broader environmental policy agenda than air quality – preserving open space and agricultural lands, maintaining pedestrian- and transit-friendly patterns of settlement, and conserving energy.

Consequently, many environmentalists expected that conformity, by seeking to control air pollution, would also support a transportation agenda with more sweeping purposes. These included sharp limits on new road capacity, increased investments in transit service, incentives for individuals to reduce their reliance on single-occupancy vehicles, and land use regulation policies to promote development patterns that required less travel.

## Conformity Requirements

How is this complex set of purposes – and the broader expectations they engender – embodied in the specific requirements of the CAAA of 1990 and the transportation conformity regulations? As noted, the core of the conformity process are procedures intended to ensure that a state does not undertake federally funded or approved transportation projects, programs, or plans that are inconsistent with the state's obligation to meet and maintain the NAAQS. This is accomplished by first using transportation demand models and mobile source emission models to make a 20-year forecast of emissions from the transportation system, taking account of changing demographics, land uses, economic development, federally mandated improvements in auto emission systems, new transportation infrastructure and services. The predicted levels of emissions in several milestone years are then compared with the maximum emissions

permissible under applicable SIPs. Thus, a conforming transportation project, program, or plan is one that:

- does not cause or contribute to any new air quality violation,
- does not increase the frequency or severity of any existing air quality violation, and
- does not delay timely attainment of air quality standards or interim emission reduction milestones.<sup>3</sup>

In the statute, Congress outlined a general set of requirements for determining conformity. MPOs must show that expected emissions from the transportation system are within the mobile source emission budgets in applicable state implementation plans (SIPs). Transportation programs must also provide for timely implementation of any transportation control measure a state has included in approved SIPs. Projects must come from a conforming plan/program and must not have changed significantly in design concept or scope. In making conformity determinations, MPOs must use emissions projections based on the most recent population, employment, travel and congestion estimates.

To flesh out the specific procedures and analytic techniques to be used within this framework, Congress required EPA to promulgate federal regulations one year from the statute's enactment (i.e., by November 1991).

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<sup>3</sup>Clean Air Act Amendments of 1990, Public Law No. 101-549, 104 Stat. 2399 (1990), codified as amended at 42 U.S.C.A. §§ 7401 et seq. (West, 1995). The Transportation Conformity provision is found in § 176 (§ 7506) of the statute.

At a minimum, these regulations were to address consultation procedures by which state and regional agencies would confer in making conformity determinations, the frequency of conformity determinations, and the procedures for determining conformity in nonattainment and maintenance areas. One year later (i.e., by November 1992), states were required to adopt SIPs that would codify their conformity procedures. Until approval of these state conformity SIPs, MPOs in ozone and CO nonattainment areas were required to show that transportation plans and programs would contribute to annual reductions of mobile source emissions.

### ***The 1991 Interim Conformity Guidance***

In June 1991, US DOT and EPA jointly issued *interim conformity guidance* that established temporary procedures until the federal conformity regulations were promulgated. The interim guidance was intended to fill a short void but continued in place for more than two years while the federal agencies negotiated and solicited stakeholder comments on the content of the regulations, not finally promulgated until November 1993.

The interim guidance specified procedures and analytic techniques nonattainment and maintenance areas should follow to meet the CAAA requirements. Among these was the establishment of quantitative emission tests to show that transportation plans/programs/projects were not increasing the frequency or severity of existing air quality violations and were contributing to annual VOC

and CO emission reductions. These emissions reduction tests included two separate analyses:

- a “build/no-build” test in which areas had to show that emissions would be less if all projects in the plan/program were implemented (the “action” scenario) than if they were not implemented (the “baseline” scenario);<sup>4</sup> and
- a “less-than-1990” test in which areas had to show that emissions in the action scenario would be lower than 1990 emission levels.<sup>5</sup>

Because PM<sub>10</sub> modeling techniques were not yet well developed, PM<sub>10</sub> conformity determinations under the interim guidance could be accomplished using qualitative assessment methods proposed by the MPO and jointly approved by US DOT and EPA. The interim guidance also included a list of specific project types that the federal agencies agreed would be “exempt.” Consequently, they could move toward imple-

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<sup>4</sup>Projects included in the baseline scenario included all in-place regionally significant highway and transit facilities, services and activities and all on-going transportation demand management (TDM) and transportation system management (TSM) activities. The action scenario included all projects in the baseline scenario plus all new regionally significant projects, including transportation control measures (TCMs) and non-federal regionally significant projects that would be implemented by the analysis year.

<sup>5</sup>The interim guidance required emissions tests for CO in CO areas and VOCs (but not NOx) in ozone areas. The less-than-1990 test was not explicitly spelled out in the interim guidance, but was clarified as being an implicit requirement of the interim guidance in a U.S. DOT memo entitled “Further Guidance on Conformity Determinations” from the Director, Office of Environment and Planning to the Regional FHWA Administrators and the Federal Lands Highway Program Administrator (dated July 27, 1992).



mentation even if they came from a non-conforming transportation plan/program.

### **The 1993 Conformity Rule**

The CAAA required that EPA, with DOT concurrence, promulgate the federal conformity regulations before the end of 1991. But development of the rule proved much more time consuming than the framers of the statute had anticipated. Following issuance of the conformity guidance in June 1991, EPA and DOT negotiated for more than a year on how to operationalize the full statutory requirements. The Notice of Proposed Rule-making (NPRM),<sup>6</sup> published on January 11, 1993, just as the Bush Administration was leaving office, generated sharp criticism from both the transportation and environmental stakeholders. Senior career officials in both agencies, eventually joined by policy officials from the new Clinton team, managed extensive consultations with stakeholder representatives, as well as further interagency negotiations, to develop the final version of the rule, which was not published until November 24, 1993.<sup>7</sup>

The 1993 conformity regulations established performance measures and procedural

requirements, specified penalties designed to motivate compliance, and indicated the circumstances under which the penalties would be applied.<sup>8</sup> It also laid out an implementation schedule, with varying conformity requirements in each phase:

- The *Interim Phase II* began 30 days after publication of the rule (December 27, 1993) and ended with an area's submission of a control strategy SIP for a particular pollutant (i.e., a SIP with an emission budget, such as the 15% VOC reduction SIP or an attainment demonstration).
- The *Transitional Period* began with an area's submission of a control strategy SIP and ended when EPA took final action on the SIP (e.g., an approval, disapproval, or finding of incompleteness).
- The *Control Strategy Period* began for an area when EPA approved its control strategy SIP and ended when the area could demonstrate that its emissions had been reduced to meet federal air quality standards. (This occurred when EPA approved the area's redesignation request, including both a demonstration that the area had

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<sup>6</sup>Environmental Protection Agency, *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or Federal Transit Act*, 40 CFR Part 51 (58 FR 3768), January 11, 1993.

<sup>7</sup>Environmental Protection Agency, *Air Quality: Transportation Plans, Programs, and Projects; Federal or State Implementation Plan Conformity; Rule*, 40 CFR Parts 51 and 93 (58 FR 62188), 24 November 1993.

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<sup>8</sup>As described below, the 1993 conformity rule has since been amended three times to simplify some of its provisions and to increase implementation flexibility. See Environmental Protection Agency, *Transportation Conformity Rule Amendments: Transition to the Control Strategy Period*, 40 CFR 51 and 93 (60 FR 40098), 7 April, 1995; *Transportation Conformity Rule Amendments: Miscellaneous Revisions*, 40 CFR 51 and 93 (60 FR 57179), 14 November, 1995; and *Transportation Conformity Rule Amendments: Flexibility and Streamlining*, 40 CFR 51 and 93 (62 FR 43780), 15 August, 1997.

attained the NAAQS and a maintenance plan that set forth strategies to sustain compliance for ten years).

- The *Maintenance Period* began with approval of the maintenance plan and continued for 20 years. (The maintenance plan covered a ten-year period, at the end of which another ten-year maintenance plan would be written to outline strategies to preserve the standard to the end of the 20-year maintenance period.)

### **Performance Standards**

To ensure that transportation plans, programs, and projects conformed to SIP commitments to meet the national air quality standards, the 1993 conformity rule maintained the emission reduction tests found in the interim guidance and added other analytic requirements:

- PM<sub>10</sub> areas, previously required only to perform a qualitative analysis, were now required to complete a quantitative analysis of PM<sub>10</sub> and its precursors (VOCs and/or NO<sub>x</sub> if they contributed significantly to PM<sub>10</sub> problems), using either the build/no-build test or the less-than-1990 test.
- Ozone areas, which had been required to perform the emission reduction tests (the build/no-build and less-than-1990 tests) only for VOCs under the interim guidance, were now also required to perform both emission reduction tests for NO<sub>x</sub> (as a precursor of ozone).

- A new emission test, the “budget test,” which makes a direct comparison between the SIP mobile source budgets and the emissions modeled from the transportation network (for all pollutants and/or their precursors) was also added by the 1993 conformity rule.

According to the regulations, for any particular pollutant for which an area was not in attainment of the NAAQS, emission reduction tests were required until the end of the Transitional Period. The budget test did not begin until the onset of the Transitional Period, when a SIP with a mobile source budget was submitted.<sup>9</sup> Thus, during the Transitional Period, both the emission reduction tests and the budget test were required. Not until the beginning of the Control Strategy Period were the emission reduction tests dropped, allowing the use of *only* the budget test. (As will be discussed below, this testing protocol was simplified through amendments to the conformity rule in 1997.)

In any conformity determination, all required emission tests were to be applied to several *analysis years*. The first analysis year was the first milestone year in the applicable SIP – 1995 in CO areas and 1996 in ozone areas.<sup>10</sup> The second analysis year was either

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<sup>9</sup>The Transitional Period could start at different times for different pollutants, depending on the due dates for control strategy SIP submissions for each pollutant. Areas in violation of the NAAQS for more than one pollutant could therefore simultaneously be in different conformity periods for different pollutants.

<sup>10</sup>SIP milestone years are ones in which specific emissions levels are to be achieved. Thus, in ozone ar-

the attainment year or, if the attainment year was the same as the first analysis year or earlier, five years after the first analysis year. The last analysis year was the final horizon year of the 20-year transportation plan.<sup>11</sup> In between, additional analysis years had to be selected so that no two analysis years were more than ten years apart. Thus, to perform the conformity analysis, a nonattainment area would complete all required emission tests for each analysis year. Nonattainment areas that were out of compliance for more than one pollutant had to complete these tests for each pollutant and/or its precursors.

### ***Procedural Requirements***

In addition to the performance standards, the 1993 conformity rule established a comprehensive set of procedural requirements. These were intended not only to standardize the analytic techniques used for conformity determinations, but also to enhance communication and coordination among the agencies involved with conformity and to ensure implementation of transportation plans/programs that have air quality benefits. In major nonattainment areas, the rule required the use of

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as, the first milestone year was 1996, when 15% reductions in VOCs were required (unless an attainment demonstration was submitted first). Subsequent milestones occur every three years thereafter as rate-of-progress reductions were required.

<sup>11</sup>Horizon years are those for which the transportation plan describes the envisioned transportation system and documents and quantifies the demographic and employment factors that influence expected transportation demand. The first horizon year is generally ten years after the base year and the final horizon year is the last year in the transportation plan.

computer simulation models to analyze the transportation system. Specifically, by January 1, 1995, CO areas and ozone areas classified serious and above had to use network-based transportation demand models with certain specific attributes. As part of the modeling protocol, the conformity rule required the use of the most recent planning assumptions available – e.g., current estimates of population, employment, travel, congestion, transit service, and TCM implementation. In addition, the rule called for use of the most recent version of the motor vehicle emission model and specified the frequency with which conformity determinations must be made.

The 1993 rule required interagency consultation on conformity determinations, but, within broad guidelines, allowed each state to craft customized procedures to reflect its own institutional arrangements for transportation and air quality planning. These were to include a delineation of the roles and procedures to be undertaken by MPOs, the state DOT, state and local air quality agencies, US DOT, and EPA before making conformity determinations and developing SIPs. In addition, the consultation procedures were supposed to establish guidelines for various conformity processes, such as selecting transportation models, deciding whether projects were exempt or regionally significant, and determining whether TCMs were being funded and implemented.

Three other conformity provisions – regarding TCM implementation, fiscal constraint, and exempt projects – sought to ensure implementation of transportation projects that benefit air quality. The first was a requirement that TCMs included in a SIP be implemented

in timely fashion. If a TCM was not being implemented on time, the MPO had to determine what obstacles existed, identify the steps being taken to alleviate the problem, and ensure that priority was being given to funding the TCM. Conformity was also made contingent on fulfilling a provision of ISTEA requiring transportation plans and programs to be fiscally constrained – i.e., they could include only projects that reasonably expected funding. Historically, transportation plans and programs listed many more projects than could be afforded. Although TCMs were included, they were frequently not implemented because the responsible agencies chose to spend available funds on other projects. In addition, the 1993 conformity rule repeated the categorization of exempt projects (which originated in the interim guidance).<sup>12</sup> This provision allowed certain transit and air quality beneficial projects – such as ride-sharing and bike and pedestrian facilities – to move forward even if the area could not pass the conformity tests.

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<sup>12</sup>The 1993 conformity rule established four categories of exempt projects, which include: (1) Safety projects, such as railroad/highway crossing, hazard elimination programs, shoulder improvements, guard-rails, median barriers, crash cushions and skid treatments; (2) Mass Transit projects, such as operating assistance to transit agencies, purchase of support vehicles, rehabilitation of transit vehicles, construction or renovation of signal systems and purchase of new buses and rail cars; (3) Air Quality projects, such as ride-sharing and van-pooling promotion activities at current levels and bicycle and pedestrian facilities; and (4) Other, such as noise attenuation, advance land acquisitions and acquisition of scenic easements.

## **Penalties and Penalty Triggers**

What made the conformity regulations compelling to transportation agencies – and potentially threatening – was that failure to fulfill these conformity requirements by specified deadlines would prevent programmed transportation projects that were not “grandfathered” (see below) from advancing through the design and construction process and, ultimately, lead to withholding of federal transportation funds.

Penalties under the 1993 conformity rule take the form of a conformity “freeze”<sup>13</sup> or a conformity “lapse.”

- During a *freeze*, no new transportation plans or programs can be approved, and no projects can be added to existing plans/programs. However, during a freeze, projects from the first three years of previously conformed plans/programs can still be advanced – i.e., reviewed under NEPA or funded for detailed design or construction.
- During a *lapse*, no new project-level conformity determinations can be made. Because the ISTEA metropolitan planning rules require that only projects from a conforming plan/program can be funded, a conformity lapse halts the flow of federal money to any new projects. However, projects can continue to be funded if they

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<sup>13</sup>The term “freeze” did not actually appear in the regulations until the 1997 amendments (see below). However, it was widely used to denote the the 1993 rule provisions with which it is associated here.

are exempt or if they are “grandfathered” (i.e., come from a conforming plan and program, have been found to conform at the project level, have completed the NEPA process as it applies to transportation, and have not changed significantly in design and scope). Grandfathered projects are allowed to continue during a lapse because they have already gone through the air quality analysis and been shown not to increase regional emissions.

The conditions under which conformity could freeze or lapse depended on specific “triggers” associated with transportation and SIP planning deadlines or inability to pass the conformity tests. The conformity triggers connected to transportation planning deadlines were fairly simple and straightforward. Conformity lapsed if the transportation plan or program was not updated and conformity re-determined at least every three years. Also, any plan revision required a TIP update and conformity re-determination within six months, unless the plan merely added or deleted exempt projects.

Conformity triggers associated with SIP planning were more varied, relating both to adoption of new SIPs and to EPA disapproval of previously submitted SIPs. Conformity of existing transportation plans had to be initially determined within 18 months of the publication of the 1993 conformity rule. Subsequently, conformity had to be determined within 18 months of approval of any new SIP that established or revised a mobile source emission budget, or added, deleted, or changed a TCM. During the transitional period, a conformity determination on plans

and programs had to be made within one year of a control strategy SIP due date.

In addition, the 1993 rule included a number of triggers tied to SIP “failures”:

- If a SIP was not submitted, or was found incomplete, conformity was first frozen 120 days after the SIP due date and lapsed 12 months after the SIP due date.
- If a SIP was disapproved, conformity lapsed 120 days after the disapproval, unless the disapproval contained a “protective finding.” EPA could give a protective finding either to an incomplete or disapproved SIP. A protective finding was granted if EPA determined that the SIP submission would have been approvable or complete if all committed measures had been submitted in enforceable form (i.e., with legally binding implementing regulations). Under a protective finding, the area would be allowed an additional 12 months after the finding to complete the SIP before conformity would lapse.

In all cases of SIP failure, a conformity freeze or lapse was based solely on the status of the SIP, which might or might not have anything directly to do with mobile sources. Moreover, the penalty was imposed irrespective of the area’s ability to meet other procedural or analytic requirements of the conformity rule. EPA developed the SIP failure triggers because it believed that, in the prolonged absence of an acceptable control strategy SIP, the CAAA required nonattainment areas to refrain from advancing transportation

projects that could increase emissions.<sup>14</sup>

## Amendments to the 1993 Conformity Rule

The first year of implementation of the 1993 conformity procedures concluded with a dramatic change in national political power. By early 1995, an aggressive new Republican Congressional majority, swept into office by the national elections of November 1994, was looking critically at all federal regulatory policies. At the same time, many state officials vocally criticized the 1993 regulations. They perceived cumbersome procedural requirements, models too crude to be used for critical regulatory purposes, and the looming possibility of widespread interruptions of federal transportation funding as a result of conformity lapses, which appeared likely to result primarily from missed Clean Air Act deadlines. These events placed conformity in a national spotlight. EPA, responding to stakeholder criticism but preserving the basic framework of the 1993 regulations, made a series of modifications to provide nonattainment areas more time for compliance and make the requirements more flexible. Three sets of amendments were eventually issued between February 1995 and August 1997.

### ***The August 1995 Amendments***

The most immediate implementation issue

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<sup>14</sup>Environmental Protection Agency, *Air Quality: Transportation Plans, Programs, and Projects; Federal or State Implementation Plan Conformity; Rule*, 58 Federal Register 62192 (24 November 1993).

in late 1994 was pressure on states to complete SIP requirements before conformity lapsed as a result of a SIP failure. The CAAA of 1990 had established two types of mandatory sanctions of which the cutoff of state transportation funds was seen as the more severe. EPA was obligated to impose this highway sanction two years after the failure of states to comply with certain provisions of the law, including SIP failures. But the 1993 conformity regulations, in effect, imposed the transportation funding sanction under an accelerated time schedule. For example, many areas whose 15% VOC reduction SIPs had been designated “incomplete with a protective finding,” pending formal adoption of state regulations, were facing conformity lapses at the end of 1994, even though they would not have been subject to highway sanctions for another year. In November 1994, moreover, states were required to submit ozone attainment demonstrations for moderate or above ozone nonattainment areas and 3% rate-of-progress (ROP) plans for serious and above ozone areas. If these submissions were not completed on time, areas would face a conformity lapse after only 120 days. But many were having difficulty putting in place the air quality dispersion modeling capacity required for these SIPs, and EPA had not resolved data and regulatory uncertainties about interstate ozone transport.

State transportation and environmental policy officials, convened through the National Governors Association to seek consensus on how these issues should be addressed, argued that imposing conformity-triggered “highway sanctions” more quickly than could be done under the mandatory sanctions provision of the

Clean Air Act was inconsistent with Congressional intent, especially when EPA was in part responsible for delays in fulfilling the Act's requirements.

EPA acted quickly to grant temporary relief to the substantial number of areas facing imminent conformity lapses. In February 1995, the agency amended the 1993 rule to increase the time period before conformity lapsed for certain types of SIP failures, effectively aligning the timing of these lapses with the mandatory CAAA highway funding sanctions.<sup>15</sup> Under these amendments, areas with certain types of SIP failures were no longer subject to the conformity lapse and were allowed two years after the finding to correct the SIP before conformity lapsed. The affected SIP failures were:

- incomplete 15% SIP with a protective finding,
- incomplete ozone attainment demonstration or 3% ROP SIP,
- failure to submit an ozone attainment demonstration or 3% ROP SIP,
- disapproval with a protective finding for any control strategy SIP for any pollutant.

The amendments, however, retained a conformity freeze and did not align the lapse dates with the CAAA sanctions dates for certain other types of SIP failures, specifically:

- a failure to submit a 15% SIP or an incomplete 15% SIP without a protective finding;

- a failure to submit or an incomplete attainment demonstration for CO, PM<sub>10</sub> or NO<sub>2</sub>; or
- a disapproval of any control strategy SIP without a protective finding.

Because the amendments dealt only with SIP failures, areas that had a complete or approved control strategy SIP were still required to fulfill the conformity requirements within one year of the SIP deadline.

### ***National Highway System Designation Act of 1995***

Although the 1993 conformity regulations had specified that conformity applied only to nonattainment and maintenance areas, environmental groups had challenged this interpretation of the CAAA of 1990. They successfully argued in litigation that conformity should also be required in attainment areas so that they could anticipate transportation emission problems that might subsequently produce violations of the national ambient air quality standards. Congress pre-empted that legal victory in November 1995, however, with a provision in the National Highway System Designation Act stating that conformity was required only in nonattainment and maintenance areas.

### ***The November 1995 Amendments***

Shortly after the interim final rule for the first amendments took effect, areas with ozone attainment demonstration problems gained further relief. In March, 1995, EPA Administrator

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<sup>15</sup>The February interim final rule, effective immediately, became final in August 1995.

Mary Nichols announced a new approach to development of ozone attainment demonstrations. It phased and delayed the attainment demonstration submission dates, allowing areas more time to study ozone transport issues and come to a regional consensus on how to deal with them. It also postponed the threat of conformity lapses due to attainment demonstration failures.

Although many areas avoided lapses through the first conformity amendments and the attainment demonstration delays, stakeholder criticisms of the conformity rule continued. In late March, the National Governors Association brought state transportation and environmental officials together with EPA and US DOT managers to outline a variety of conformity issues they wanted addressed. The state representatives pushed EPA to align the lapse dates for SIP failures that were not covered by the first amendments with CAAA highway sanction dates. State officials also advocated making the regulations less cumbersome and more flexible. They sharply questioned the value of the build/no-build test once a SIP budget had been submitted. Another concern was the inability of areas to adopt non-federally funded projects during a conformity lapse. States also wished to have a mechanism in the conformity rule that would allow non-exempt projects to be added to plans/programs without a full-scale regional analysis. Of concern to some states was the burden placed on rural nonattainment areas by a lack of comprehensive transportation planning and modeling capacity, which made it difficult to link specific transportation projects to regional emissions impacts. States also sought greater flexibility in making TCM substitutions in SIPs and pointed out the need

for an easier way in which to change SIP budgets to reflect updated models and/or assumptions. These issues were discussed in greater detail in April at a national stakeholders meeting, including the federal agencies, state DOTs, MPOs, air agencies, and environmental advocacy groups.

In responding to these concerns, EPA dealt again with the most pressing issues and held the more difficult and less time sensitive for later deliberation. The second package of amendments to the 1993 conformity rule (proposed in August 1995 and published as a final rule in November 1995) included the following provisions:

- Conformity lapses were aligned with CAAA highway sanctions for some of the SIP failures not covered by the first amendments:
  - failure to submit or an incomplete 15% SIP without a protective finding and
  - failure to submit or an incomplete CO, PM<sub>10</sub>, or NO<sub>2</sub> attainment demonstration.
- The grace period during which areas were required to make a conformity determination after the submission of a control strategy SIP was extended from 12 to 18 months.
- SIP TCMs were allowed to proceed during a conformity lapse.



### **The August 1997 Amendments**

Further changes took two more years of consultation and negotiation. The third amendments to the 1993 conformity rule, initially proposed in July 1996 and published in final form in August 1997, dealt with several issues that had been previously raised by stakeholders. The most important provisions simplified the emission test requirements:

- Areas were allowed to drop the emission reduction tests (build/no-build and less-than-1990) and use the budget test within 45 days of a SIP budget *submission*.<sup>16</sup> (Previously both the emission reduction tests and the budget test were required until the budget was *approved* by EPA.) This significantly simplified the testing protocol and eliminated several conformity phases that had previously governed the application of emission tests.
- Rural nonattainment or maintenance areas were given the option of choosing the budget test, the emissions reduction tests (build/no-build and/or less-than-1990 test) or dispersion modeling to demonstrate conformity in the years not addressed by the SIP.

The 1997 amendments also made a number

of changes to give areas greater flexibility in applying the conformity requirements:

- In areas with a disapproved SIP without a protective finding, the transportation plan or TIP would be frozen (instead of lapsing) 120 days after the disapproval.
- During a conformity lapse, non-federal projects could be implemented if they were included in the first three years of the most recent plan/program conformity determination.
- Traffic signalization projects did not have to come from a conforming plan/TIP in order to advance, but the emissions associated with these projects had to be included in the next regional analysis.<sup>17</sup>
- The transportation network modeling requirements were streamlined.

However, the 1997 amendments to the conformity rule did not address the issue of flexibility for transportation control measures, which had concerned a number of states, because EPA believed that TCM substitutions were already possible under existing policies for SIPs.

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<sup>16</sup>If a previously approved budget existed, that budget continued to apply for the years it covered.

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<sup>17</sup>This provision reflected a Clean Air Act Amendment enacted by Congress in September 1996.

# **CHAPTER 3: IMPLEMENTING THE TRANSPORTATION CONFORMITY REQUIREMENTS**

## **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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## IMPLEMENTING THE TRANSPORTATION CONFORMITY REQUIREMENTS

The 1993 transportation conformity regulations established a set of technical and procedural requirements, described in Chapter 2, that had to be satisfied in order to demonstrate conformity. Each of the 15 study sites experienced at least some difficulty with these requirements, which the remainder of this chapter describes. This analysis emphasizes the *problems* encountered as conformity was implemented.<sup>1</sup> Chapters 4 and 5 explore more broadly the impacts that the conformity process had on transportation and air quality planning.

The problems encountered implementing conformity in the study sites, summarized in Table 3-1 by study site, are grouped in six categories:

- **Emission tests:** passing the emission budget and build/no-build tests,
- **Modeling procedures:** fulfilling the transportation modeling requirements,
- **TCM implementation:** demonstrating timely implementation of those transportation control measures committed to in control strategy SIPs and maintenance plans,
- **Fiscal constraint:** showing that the

transportation plan and program meet the ISTEA fiscal constraint requirement,

- **SIP failure:** triggering conformity problems because of problems with SIP submissions, and
- **Human error:** experiencing conformity problems because of procedural confusion and/or data analysis mistakes.

As will be discussed, the nature and consequences of these problems for the transportation planning process and air quality regulation varied significantly. In applying the specific emission tests of the 1993 regulations, five study areas encountered significant difficulties with the budget tests, which continue to pose serious problems for Atlanta, Charlotte, and Houston. The build/no-build test was problematic for even more areas, but the difficulties were less severe – and, because this requirement was substantially altered by the 1997 conformity amendments, the problem has become moot in most areas. No study area reported difficulty with the less-than-1990 test.

The other conformity requirements were generally less problematic than the emission tests. While a number of study sites had some difficulties gearing up for the network modeling requirements of the 1993 regulations, only New York City and Chicago faced serious conformity delays as a result.

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<sup>1</sup>As noted in Chapter 1, although a full assessment of the technical dimension of conformity modeling was beyond the scope of the research, the project sought to examine the technical issues in the larger context of the institutional relationships involved.

Table 3-1  
Types of Conformity Problems by Nonattainment Area

Nonattainment Area	Emission Budget Test	Emission Build/ No-Build Test	Modeling Requirements	Timely TCM Implementation	Fiscal Constraint	SIP Failures	Human Error
Atlanta	X					X**	
Baltimore		X*				X	
Boston		X			X		X
Charlotte	X						X
Chicago		X	X				
Denver	X				X		
Houston	X	X			X	X**	
Milwaukee		X*					
New Jersey		X*					
New York		X*	X				
Philadelphia		X*					
Phoenix		X	X				
Portland							X
Salt Lake	X					X	
San Francisco				X			

\* Although these areas have reported very close calls passing the build/no-build test, particularly for NO<sub>x</sub>, they have not necessarily had to make any adjustments and have not experienced conformity delays as a result.

\*\* These are technical SIP failures that had no discernable impact on local planning.

The fiscal constraint requirement posed no serious problems for any areas, although Boston experienced a brief conformity delay because of this test. Initially, the provisions of the 1993 rule regarding SIP failures caused problems for a few areas; but the 1995 conformity amendments alleviated this issue. Within the study time frame, only Salt Lake City suffered a conformity freeze or lapse because of SIP failure.

Table 3-2 identifies for each study site the conformity problems encountered and their impacts. In the following pages, the extent to which study sites experienced difficulty with each category of conformity problem is examined in greater depth.

## Passing the Emission Tests

The 1993 conformity rule requires areas to demonstrate that emissions from transportation plans/programs will remain within the allowable cap set by the SIP budget (the *emission budget* test) and that transportation plans will contribute to the overall reduction of pollution (the *build/no-build* and the *less-than-1990* tests).

### **Budget Test**

Difficulty passing the budget test has proven to be the most serious type of conformity problem, causing most of the lapses experienced in the study areas. Five of the study areas have experienced difficulties with the budget tests. Four of them – Atlanta, Charlotte, Houston, Salt Lake City – had difficulty passing the ozone budget tests; and two areas

– Denver and Salt Lake City – had trouble with  $PM_{10}$  budgets. Only Houston was able to avoid a lapse during the study period. As a result, budget test problems have had the largest impact on transportation and air quality planning (as will be discussed in greater depth in Chapters 4 and 5).

**ATLANTA.** Ozone budget test difficulties have led to a conformity lapse and caused a number of transportation projects to be scaled back, delayed, or indefinitely postponed. Although the area had little difficulty with conformity in 1994, the MPO began implementing model and data upgrades in 1995 that predicted higher emission levels than had been reflected in the earlier analysis. As a result, Atlanta barely squeaked through its 1995 budget analysis.

In 1996, passing the budget test proved even more problematic. Because the area was experiencing higher than expected VMT growth and was slow to implement inspection and maintenance and reformulated gasoline programs, its 1999  $NO_x$  budget for ozone set an emissions cap that the area could not meet in developing a new TIP. ARC, the Atlanta MPO, and Georgia DOT struggled to develop strategies that would close the large gap between allowable and projected emissions. Ultimately, the northern arc of the Outer Loop was barred from moving into the TIP, the road to the massive new Mall of Georgia was scaled back, and only exempt and grandfathered projects from the previously conformed 1995 TIP were allowed to move forward.

These problems continued throughout 1997 during which ARC could not develop a

Table 3-2

### Problems Meeting the Conformity Requirements by Nonattainment Area<sup>1</sup>

Area	Problem	Impact
<b>Atlanta</b>	1996 - Budget Test (NOx for ozone) 1997 - Budget Test (NOx for ozone)	1996 - Conformity determination could not be completed; MPO advanced only grandfathered and exempt projects. 1997 - Conformity determination could not be completed. After EPA-DOT dispute resolved, MPO adopted Interim TIP with only grandfathered and exempt projects. <b>Conformity lapsed:</b> January 1998.
<b>Baltimore</b>	1995 - Non-implementation of ECO 1997 - Legislature made I/M voluntary	1995 - MPO developed Regional Commuter Assistance Program to make up for lost emission reductions from ECO program. 1997 - Governor vetoed voluntary I/M program in part because a non-mandatory program would have caused EPA disapproval of the 15% SIP, with consequences for conformity.
<b>Boston</b>	1994 - Data Entry Error 1994 - Fiscal Constraint 1995 - Build/no-build Test (for CO, VOC and NOx)	1994 - Conformity determination delayed for 2-3 months until problem discovered. 1994 - Conformity approval delayed while STIP fiscal constraint resolved. 1995 - MPO added CMAQ project to TIP for off-model analysis.
<b>Charlotte</b>	1994 - Budget Test (NOx and VOC for ozone) 1996 - Budget Test (NOx and VOC for ozone)	1994 - Conformity analysis completed by creating budget reconciliation methodology. 1996 - Conformity determination could not be completed. MPO advanced only grandfathered and exempt projects. <b>Conformity lapsed:</b> January 1997, with no resolution by early 1998.
<b>Chicago</b>	1994 - Build/no-build Test (NOx for ozone) 1994 - Network model assumptions questioned 1995 - Network model enhancements not in place	1994 - MPO completed off-model analysis for replacement buses. 1994 - Conformity determination delayed while MPO justified its low VMT estimates. 1995 - MPO advanced only grandfathered and exempt projects.

<sup>1</sup>Milwaukee, New Jersey and Philadelphia are not included in this table because they reported only problems with the build/no-build tests that did not cause a delay to the conformity determination.

Area	Problem	Impact
<b>Denver</b>	1994 - Budget Test (PM <sub>10</sub> ) 1996 - Budget Test (PM <sub>10</sub> & NO <sub>x</sub> for PM <sub>10</sub> )	1994 - <b>Conformity lapsed:</b> November 1994 for approximately one year, until September 1995. Amended PM <sub>10</sub> budgets. 1996 - MPO negotiated local agreements for sanding and sweeping measures, and air agency tightened I/M NO <sub>x</sub> test for future years.
<b>Houston</b>	1994 - Build/no-build Test (NO <sub>x</sub> for ozone) 1994 - Budget Test (VOC for ozone) 1997 - Budget Test (VOC for ozone)	1994 - Conformity delayed while waiting for a temporary NO <sub>x</sub> waiver. 1994 - MPO spread large highway projects out over several years and scaled back the Grand Parkway. 1997 - Air agency made technical corrections to submitted VOC budget.
<b>New York</b>	1995 - No network based transportation demand model 1996 - No network based transportation demand model	1995 - MPO advanced only grandfathered and exempt projects. 1996 - MPO received extension of 1994 TIP to advance grandfathered and exempt projects. In 1997, a new interim network model was approved, new budgets were submitted, and conformity determined.
<b>Phoenix</b>	1994 - Build/no-build Test (NO <sub>x</sub> for ozone) 1995 - Network model enhancements not complete	1994 - Conformity determination delayed several months until NO <sub>x</sub> waiver approved; MPO advanced only grandfathered and exempt projects 1995 - Conformity determination delayed until MPO completed model enhancements
<b>Portland</b>	1994 - Human Error (incorrect assumptions used in conformity analysis)	1994 - <b>Conformity lapsed</b> for one year; MPO advanced only grandfathered and exempt projects
<b>Salt Lake</b>	1993 - Incomplete SIP without protective finding. 1994 - Budget Test (NO <sub>x</sub> for PM <sub>10</sub> ) 1995 - Budget Test (NO <sub>x</sub> for ozone)	1993 - <b>Conformity frozen</b> until SIP found complete in 1994. 1994 - <b>Conformity lapsed</b> November 1994 to October 1995; MPO received permission from EPA to use MOBILE 4 for conformity analysis of NO <sub>x</sub> for PM <sub>10</sub> . 1995 - Air agency added ten years to the ozone maintenance plan.
<b>San Francisco</b>	1996 - Timely Implementation of TCMs questioned	1996 - MPO made more detailed accounting of TCM problems and steps to alleviate them.

new long-range plan that conformed. In August 1997, FHWA granted a six-month TIP extension, during which a controversy over grandfathering projects surfaced. Not able to develop a full conforming TIP, the MPO drafted an *interim* TIP (ITIP) that contained only TCMs written into SIPs that had received EPA approval, as well as grandfathered and exempt projects from the 1995 regional transportation plan update. Several dozen projects that ARC originally wanted to regard as grandfathered were not ultimately included in the ITIP because FHWA felt they could not meet the applicable NEPA requirements; EPA simultaneously reviewed the NEPA documents. FHWA's regional office was then prepared to approve the ITIP, but EPA's regional office raised concerns about several of the remaining grandfathered projects in the ITIP.

This led to sharp policy disagreements among the federal agencies. Even though the 1995 plan had received a conformity determination, EPA's regional office argued that the conformity analysis had not satisfied all of the applicable requirements of the conformity rule. EPA therefore believed that the disputed projects should not be grandfathered because they would substantially increase highway capacity, worsening air quality problems. Staff from the White House Council on Environmental Quality ultimately brokered a regional-level agreement among EPA, FHWA, and FTA that allowed five of six disputed projects to move forward in the ITIP, with two of these limited to planning and design. ARC removed the sixth project from the ITIP. The EPA-FHWA-FTA agreement also established dates by which the Atlanta area should complete a conforming long-range plan and an ozone

attainment demonstration.<sup>2</sup> Conformity lapsed in Atlanta on January 17, 1998.

**CHARLOTTE.** Like Atlanta, Charlotte has also experienced recurring problems with the ozone budget tests. Initially, these seemed mainly to be procedural difficulties, but subsequent problems led to a prolonged conformity lapse and the delay of some transportation projects. In 1993, the state air agency chose to request redesignation to attainment for Charlotte as a moderate ozone area that had not had recent air quality violations; the area prepared a maintenance plan rather than submit a 15% VOC reduction SIP. In 1994, during its first conformity determination under the 1993 conformity rule, the area found that future VOC and NO<sub>x</sub> emission projections derived from the transportation plan were higher than the emission budgets in the ozone maintenance plan. Planners at the state air agency believed that the higher emissions in the transportation plan were due not to an actual increase in pollution, but to the difference between the methods used to calculate VMT in the base year for the emission budgets (using HPMS and other data) and those used to develop the new transportation plan (using the MPO's travel demand models). To rectify this problem, the area developed a reconciliation methodology that applied a corrections factor to the base-year inventories to make them comparable to the 1990 emission levels in the transportation

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<sup>2</sup>In addition, the agreement recognized the need for national-level staff of EPA, FHWA, and FTA to develop a national memorandum of understanding or make changes in the conformity regulations to ensure proper use of the grandfathering provision, particularly to see that it was not used to evade the consequences of a conformity lapse.



plan. The air agency argued that once the difference in the base-year VMT calculations was reconciled, the area should conform if the emissions growth rate in the transportation plan stayed below the growth rate in the maintenance plan. Although the area passed conformity in 1994 using this methodology, EPA subsequently required that the area develop a technique that adjusted base-year VMT to match the SIP's base year emissions inventory rather than vice versa, as any adjustments applied to the budget would require a SIP amendment. The state and MPO subsequently accomplished this.

Problems with conformity did not surface again in Charlotte until 1996, when the area, experiencing substantial increases in VMT, began to have serious trouble passing the ozone budget tests for NO<sub>x</sub> and VOC. In 1995, the MPO had decided that a conformity analysis was not required since the projects in the new TIP came from a conforming plan and had not undergone any major changes. Later in the year, however, the air agency discovered an error in its emission budget calculations. When the corrected budget was used in the conformity analysis for a proposed 1996 TIP, the results showed a substantial exceedance of the emission budget. Although much effort went into finding a solution – with the MPO, state DOT, and state air agency staff discussing many potential solutions – the budget test disparity could not be resolved, and the TIP could not be adopted. During 1996, the agencies tried unsuccessfully to develop a required transportation plan update that could meet conformity requirements. Conformity therefore lapsed in January 1997, and this lapse had not yet been resolved by early 1998. Although numerous grandfathered and exempt

projects continued to move forward during the lapse, three new transportation projects were held up.

**HOUSTON.** The budget test for ozone has also posed difficulties for Houston. Although at the end of the study period, the area had been able to resolve its conformity problems without a lapse, it was uncertain how much longer it would be able to do so. Houston's conformity problems began in 1994 when the area had trouble passing the VOC budget test. It resolved the problem by postponing some highway projects and scaling back the massive Grand Parkway project (although this was done more to meet fiscal constraint requirements than to pass the emission test). In 1997, Houston again had difficulties when it ran its first conformity analysis using a 1999 VOC budget, which tightened the emission cap from the 1996 budget level. Transportation planners found it difficult to show that emissions toward the end of the 20-year transportation planning horizon would stay below 1999 levels. This problem was resolved by making technical corrections to the submitted (but not yet approved) SIP that recalculated the budget using VMT estimates from the travel demand models rather than from HPMS data.

At the end of the study period, Houston was anticipating future problems passing the NO<sub>x</sub> budget test for ozone. The area had been granted a temporary NO<sub>x</sub> waiver in April 1995 that permanently expired at the end of 1997. As planners looked ahead, they were uncertain how the area would be able to reduce mobile source NO<sub>x</sub> emissions sufficiently to stay within the emission cap imposed by a NO<sub>x</sub> budget.

**SALT LAKE CITY.** The budget test for ozone also created problems for Salt Lake City, but this area did not experience a lapse. Like Charlotte, Salt Lake City had been redesignated to attainment, submitting a maintenance plan rather than a 15% SIP in 1993. In 1994, the area had difficulty demonstrating that emissions toward the end of the 20-year transportation planning horizon would stay below the 2005 NO<sub>x</sub> budget in the ozone maintenance plan. To alleviate the problem, the area added 10 years to the maintenance plan, establishing budgets to 2015. The extended budgets, which take account of emission reductions from vehicle fleet turnover, allow NO<sub>x</sub> emissions (as a precursor of ozone) to rise after the end of the 10-year maintenance plan without causing violations of the ozone standard. With higher budgets, the area passed conformity in 1995 and has not encountered subsequent problems with the conformity emissions tests for ozone.

In addition to its ozone budget problems, Salt Lake City also had difficulty passing the NO<sub>x</sub> budget test for PM<sub>10</sub> in 1994. The area's PM<sub>10</sub> SIP had been developed in the late 1980s – long before the budget concept or the conformity procedures had been established in law. This proved particularly problematic for NO<sub>x</sub> (as a precursor of PM<sub>10</sub>). Although NO<sub>x</sub> was not a consideration when the SIP was written, an implicit NO<sub>x</sub> budget was derived from the SIP. Further complicating the NO<sub>x</sub> issue was the fact that the NO<sub>x</sub> budget had been derived using MOBILE 4, while the conformity analysis used MOBILE 5, which calculated much higher NO<sub>x</sub> emissions for mobile sources. Unable to make this “apples and oranges” comparison work for conformity, the area lapsed in November 1994. Advancing

only grandfathered and exempt projects, the MPO tried to convince EPA that the budget problem was not the result of real increases in emissions but of differences in the way MOBILE 4 and MOBILE 5 projected NO<sub>x</sub> emissions. EPA was eventually persuaded and has since allowed the Salt Lake City area to use MOBILE 4 in the conformity analysis for NO<sub>x</sub> (as a precursor of PM<sub>10</sub>, but not of ozone).<sup>3</sup>

**DENVER.** Like Salt Lake City, Denver lapsed when it tried to test conformity using budgets that were implicitly derived from a PM<sub>10</sub> SIP that pre-dated the conformity rule. Denver's budget problems began in 1994 during the conformity analysis of the 1994 TIP. Transportation planners could not demonstrate that emissions in the final horizon year of the transportation plan (2015) would stay below the 1997 PM<sub>10</sub> budget of 44 tpd in the maintenance plan. The area lapsed and advanced only grandfathered and exempt projects while it undertook the difficult and contentious task of amending the PM<sub>10</sub> budgets.

Working together, regional transportation and air quality planners sought a solution that would allow them to increase the PM<sub>10</sub> budget without jeopardizing the area's ability to reach PM<sub>10</sub> attainment. Analysis indicated that peak regional PM<sub>10</sub> emissions would be approximately 65 tpd in Denver's downtown core in 2015 if the proposed transportation plan were implemented. Further, the planners determined that the regional PM<sub>10</sub> emissions

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<sup>3</sup>EPA permitted this practice in a limited number of PM<sub>10</sub> nonattainment areas because the SIP had been submitted and approved before the 1993 conformity regulations were finalized.

budget could be raised from 44 to 60 tpd – without either imposing new controls on stationary and area sources or causing violations of the NAAQS. Therefore, they proposed adopting mitigation measures that would reduce 2015 emissions to the 60 tpd level in the Denver core, while allowing the permissible level of PM<sub>10</sub> emissions to rise to the 60 tpd level in the suburban areas of the region.<sup>4</sup> This proposal provoked months of controversy and criticism from environmental and public health advocates regarding the health effects of increased particulate levels. The proposed budget increase was approved for only a three-year period by the state air agency, allowing the area to conform the plan and TIP in 1995 but posing the threat of a recurring conformity problem. The state legislature subsequently intervened to allow the budget amendment to apply throughout the period covered by the SIP.

In 1996 Denver more briefly experienced problems passing the budget tests for both PM<sub>10</sub> and NO<sub>x</sub> (as a precursor of PM<sub>10</sub>), but was able to find solutions without sparking a major controversy or experiencing a lapse. To do so, the area adopted street sanding and sweeping agreements at the local level to reduce PM<sub>10</sub> emissions and promised future-year tightening of the standards in inspection and maintenance tests to pass the NO<sub>x</sub> budget test.

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<sup>4</sup>DRCOG was able to quantify its safety margin, showing how much emissions might rise, and assigned that budget to mobile sources. In its PM<sub>10</sub> SIP, it used dispersion modeling to determine where violations would occur in the region and committed to do dispersion modeling in the future to demonstrate conformity. The SIP also commits DRCOG to adopt additional control measures if they are needed in the future to pass conformity tests.

### **Build/No-Build Test**

Many areas in the study experienced difficulty with the build/no-build tests – especially for NO<sub>x</sub>. In some instances the conformity determination was slowed or delayed, but in no case did conformity lapse as a result of the build/no-build test.

Two study sites – Houston and Phoenix – realized in 1994 that they would not be able to pass the NO<sub>x</sub> build/no-build test. Each applied for a NO<sub>x</sub> waiver, which delayed its conformity determination while the waiver was processed. Phoenix received a permanent waiver, and Houston was granted a temporary waiver pending the results of a study to determine whether or not the area would benefit from NO<sub>x</sub> controls. Houston's waiver, as noted above, expired at the end of 1997.

Several other study sites – including Baltimore, Boston, Chicago, Milwaukee, New Jersey, New York, and Philadelphia – have had varying degrees of difficulty with the build/no-build test. Some have been able to pass the NO<sub>x</sub> build/no-build only by a razor-thin margin, sometimes by making small adjustments in the initial modeling assumptions. Some reported tipping the scales through off-model analysis of CMAQ projects that were not captured by the network model. Chicago followed this strategy in 1994, taking credit for new alternative fuel buses. (It subsequently applied for a NO<sub>x</sub> waiver, which was granted in 1996.) After similar difficulty in 1995, the Boston MPO developed a way of handling this type of situation. It routinely does not claim credit in the regional analysis for projects such as park-and-ride lots, van-

pool programs, or replacement buses. Then, if build/no-build problems arise, it completes an off-model analysis of specific projects to demonstrate conformity.

Baltimore faced a potential build-no build problem that stemmed from state government resistance to the national Employee Commute Option program mandate in severe ozone non-attainment areas. Baltimore's 1994 transportation plan assumed ECO implementation. But in the face of significant opposition from the Baltimore business community, which feared being at a disadvantage to its competitors in nearby Washington, D.C. (an area not subject to the ECO mandate), Maryland's governor issued an executive order declaring ECO voluntary; and the legislature eliminated all program funding.<sup>5</sup> When the Baltimore MPO continued to include ECO in its 1995 conformity analysis, the state air agency expressed discomfort that the program was nonetheless credited; and an environmental group questioned the validity of claiming full emission credit for a voluntary program. The MPO therefore deleted ECO from the conformity analysis, replacing it with a regional commuter assistance program that it pledged to implement in 2005.

Boston and Chicago reported a technicality in the way the build/no-build analysis is calculated that made the test highly problematic. Boston cited an example from its 1995 conformity analysis. When planners analyzed the 1996 milestone year, FY 1996 projects were in both the "action" scenario and the

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<sup>5</sup>Congress subsequently amended the Clean Air Act to make the ECO program voluntary in the areas previously required to implement the program.

"baseline" scenario (because it had already been conformed in the FY 1995-97 TIP). Because there had been no other regionally significant changes, the analysis showed no decrease in emissions in the "action" scenario, which is required by the conformity rule. The Boston MPO resolved this problem by adding a CMAQ project to the TIP for off-model analysis. Chicago, as noted above, took credit for new alternative fuel buses.

Most of the issues with the build/no-build tests no longer exist with implementation of the 1997 amendments to the conformity rule, which allow areas to use only the budget test for conformity 45 days after a SIP with a budget is submitted.<sup>6</sup> Previously areas were required to continue the build/no-build tests until submitted budgets were approved by EPA, a process that can take more than a year.

### ***Less-than-1990 Test***

No study site reported problems satisfying the requirements of the less-than-1990 emission test.

## **Using the Required Modeling Techniques**

Several areas had conformity problems due to the conformity rule's demand for use of a

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<sup>6</sup>This holds true unless a SIP budget has previously been approved by EPA for all or part of the time period in question. In that case, the old approved budget must be used for the time period for which it was approved until the new budget is approved as a replacement.

network-based transportation demand model with specific attributes. As noted earlier in this chapter, New York City experienced the most difficulty meeting the modeling requirements as the area had not previously used a network based model. New York demonstrated conformity in 1994 using qualitative analysis and sketch planning techniques, but it did not have the required network model up and running by the January 1995 deadline. The area therefore advanced only exempt and grandfathered projects in 1995. When the models were still not in place by 1996, the area sought and received a third-year extension of its 1994 TIP, continuing to move forward exempt and grandfathered projects. The first generation of network models was finally operational in 1997, and New York City was at last able to complete the required conformity analysis to adopt a new plan and TIP.

Chicago and Phoenix also experienced conformity delays while they worked on upgrading network models they already had in place. Chicago undertook a major overhaul of its already existing network model. In the process, CATS had to forgo a conformity analysis in 1995 as the required changes were not yet in place. The area therefore had to delay implementation of some projects, advancing only those that were grandfathered and exempt until the next conformity cycle. In Phoenix, the 1995 conformity determination was delayed – but only briefly – while model enhancements were completed.

## **Demonstrating Timely Implementation of SIP TCMs**

Of the 15 study sites, only San Francisco reported any difficulty documenting timely implementation of SIP TCMs, and this did not cause any delay in demonstrating conformity. As part of the settlement of the suit brought by the Sierra Club Legal Defense Fund and other environmental advocates against the Metropolitan Transportation Commission (MTC), San Francisco was required to incorporate a number of TCMs which dated back to its 1982 SIP into its ozone maintenance plan. Because a number of these were imprecisely defined, the Bay Area air agency and the EPA regional office in 1996 questioned their timely implementation, which had not been well documented in previous conformity analyses. In response, MTC provided a more detailed description of the TCMs and explained the steps taken to implement them, which satisfied the air district and EPA that the conformity requirement was being met.

## **Meeting the Fiscal Constraint Requirement**

Many study areas indicated that the fiscal constraint provision of ISTEA, also a conformity requirement, has had significant impact on transportation plans/programs. Many MPOs have had to pare down long lists of projects included in earlier plans for which funding could not be reasonably expected. As previously mentioned, Houston scaled back its Grand Parkway project to ensure that its long-range plan met ISTEA's fiscal constraint requirement. Only Boston and Denver among

the study sites, however, had any problems completing a conformity determination because of fiscal constraint problems.

Boston's problem in 1994 was not directly a conformity problem but did cause a delay in concluding the area's conformity determination. During the approval process of its FY 1995-97 STIP, FHWA's Massachusetts division office cited two fiscal constraint problems. FHWA believed that the second year of the STIP (FY 1996) was 100% over-programmed because it budgeted the sum of its highway apportionments, plus its unobligated balance. In addition, the state was counting on money from a bond bill not yet approved by the legislature to fund a major project during the first two years of the STIP. FHWA and FTA therefore deferred approval of the STIP pending resolution of these issues. This action effectively put the Boston TIP conformity determination on hold until the state produced a financially constrained STIP in March 1995. Although highway funding was held-up and TIP conformity could not proceed, this was not technically a "conformity lapse," having been caused by a funding dispute between FHWA and the state over the STIP.

In 1996, Denver area environmentalists raised fiscal constraint issues during the conformity process. Arguing that the MPO was mitigating emissions from the E-470 tollway project by claiming credit for transit expansion projects that did not have secure funding, they threatened to sue on the grounds that the plan was not adequately fiscally constrained. The MPO counter-argued that the emission benefits of the transit projects were so small that the projects could be totally removed from the plan without threatening the conformity

determination. Ultimately, no litigation was filed, and there was no delay in the conformity determination.

## Links to SIP Failures

Under the 1993 conformity rule, certain types of SIP failures (described in Chapter 2) can trigger a conformity freeze or lapse, regardless of a satisfactory emission analysis of the transportation plan or program. Several examples of this were found in the 15 study sites.

Initially, areas had one year to submit a control strategy SIP and have EPA declare it complete – or else conformity would lapse. Given myriad challenges during the start-up phase of CAAA implementation, a number of areas around the country did not meet this deadline and therefore experienced conformity lapses while SIP requirements were completed. Two study areas – Atlanta and Houston – appeared on FHWA's lapse list during this period. It appears, however, that any impacts there were quite minimal. When interviewed later, area planners were either unaware of or didn't remember that a lapse had occurred.

Subsequently, the February 1995 conformity amendments increased the time for areas to submit complete SIPs to two years, aligning the SIP conformity lapse with imposition of CAAA highway sanctions. Several other study areas – including Baltimore, Boston, Milwaukee, New York City, Philadelphia and Phoenix – were saved from a lapse by this change.

Salt Lake City had a more serious SIP “completeness” problem. In 1993 it submitted an ozone attainment redesignation request, which EPA subsequently declared incomplete. Under the 1993 conformity rule, conformity was, in effect, frozen – that is, beginning 120 days after the finding, no new transportation plans or programs could be approved and no projects could be added to existing plans/programs. The area sued EPA; and as a result of subsequent negotiations, EPA declared the submission complete in July 1994, ending the problem.

Baltimore faced a potential SIP failure problem in 1997 when the Maryland legislature passed a law that would have made the state’s I/M program voluntary. This would have caused the 15% VOC reduction SIP to be disapproved by EPA. The Governor vetoed this bill at least in part because of the conformity implications of failing to implement the required form of I/M. At the end of the study period, Boston and New Jersey were also anticipating possible conformity problems associated with delays in their I/M programs.

## Human Error

In the course of interpreting and executing the analytic and procedural requirements of conformity, three areas have had problems that are attributable simply to human error. Portland is the most dramatic example. In

1994, during the first conformity analysis under the 1993 conformity rule, the MPO had some difficulty interpreting the build/no-build requirements. Because it made incorrect assumptions about which projects should go into the build and the no-build scenarios, the conformity determination was invalid. When this was discovered, the area decided to let conformity lapse for a year rather than expending the resources to re-do the analysis. This decision resulted from the realization that a lapse would not interfere with currently planned projects, which were either exempt or grandfathered.

Boston also encountered conformity difficulty due to a human error. In 1994 the area could not pass the build/no-build tests for VOC, NO<sub>x</sub>, or CO due to a calculation error in a spreadsheet the air agency provided to the MPO for the conformity analysis. After the two agencies probed the causes of the conformity problem for a few months, the error was discovered and corrected.

As mentioned above, the North Carolina air quality agency made a mistake in the calculation of Charlotte’s NO<sub>x</sub> and VOC budgets in 1994, which made passing conformity easier at that time. However, when the error was corrected, subsequent emission analysis in 1996 – which also took account of changing conditions – revealed conformity difficulties that had not been resolved at the conclusion of the study period.

## **CHAPTER 4: INSTITUTIONAL ROLES IN THE TRANSPORTATION CONFORMITY PROCESS**

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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## INSTITUTIONAL ROLES IN THE TRANSPORTATION CONFORMITY PROCESS

Fulfilling the purposes of conformity depends crucially on creating stronger institutional links between two policy areas – transportation and air quality – that had operated quite independently of each other prior to enactment of the CAAA of 1990.

The previous framework of federal law did not create effective incentives for collaboration between the agencies working in the two policy areas. It required integration between separately mandated transportation and air quality planning processes. But it provided minimal federal financial aid for planning activities, and few penalties were imposed on states for failing to implement pollution reduction policies contained in their SIPs.

As a result, although air quality regulators could seek pollution reductions from the transportation sector, they frequently could not secure the commitment and cooperation of the transportation agencies in developing policies to achieve this purpose. Nor could the regulators assure that state and local elected officials would actually adopt the policies the regulators mandated. They could not ensure, therefore, that the air quality impacts of transportation policies would be taken into account in decision making, that transportation projects inconsistent with pollution reduction targets would not be undertaken, and that promised projects with air quality benefits would actually be implemented.

Enactment of the CAAA of 1990 and

ISTEA created a new regulatory climate. Transportation agencies were directed to make air quality a key goal and were given strong fiscal incentives for compliance. But the intent of the conformity regulations and other provisions of the new laws was not merely to impose tougher command-and-control regulations. At least as important was establishing a procedural framework for collaboration among transportation and air agencies.

For the core regional and state agencies involved – particularly MPOs, state and regional air agencies, and state DOTs – implementation of the conformity regulations created significant stresses, not merely in terms of what conformity itself required but also in the context of broader changes stemming from the CAAA and ISTEA. Even without the conformity requirements, air quality and transportation agencies faced substantial increases in workload as well as the need to develop new skills and to build relationships with other agencies.

This chapter examines this institutional dimension of conformity. Table 4-1 identifies the core public agencies concerned with conformity in each study site. The chapter inquires first into how these agencies went about building the organizational capacity, particularly the technical tools, they needed to carry out the conformity requirements. Then it explores the development of interagency consultation practices, both in terms

Table 4-1

**Core Public Agencies in Transportation and Air Quality Planning, by Nonattainment Area**

<b>NONATTAINMENT AREA</b>	<b>METROPOLITAN PLANNING ORGANIZATION</b>	<b>STATE TRANSPORTATION AGENCY</b>	<b>STATE AIR QUALITY AGENCY</b>	<b>LEAD AGENCY FOR SIP DEVELOPMENT</b>
<b>Atlanta</b>	Atlanta Regional Commission (ARC)	Georgia Department of Transportation (GDOT)	Georgia Department of Natural Resources (DNR)	State AQ agency
<b>Baltimore</b>	Baltimore Metropolitan Council (BMC)	Maryland Department of Transportation (MDOT)	Maryland Department of the Environment (MDE)	State AQ agency
<b>Boston</b>	Boston MPO	The Executive Office of Transportation and Construction (EOTC)	Massachusetts Department of Environmental Protection (DEP)	State AQ agency
<b>Charlotte</b>	Mecklenburg/Union MPO	North Carolina Department of Transportation (NCDOT)	North Carolina Department of Environment and Natural Resources (DENR)	State AQ agency
<b>Chicago</b>	Chicago Area Transportation Study (CATS)	Illinois Department of Transportation (IDOT)	Illinois Environmental Protection Agency (IEPA)	State AQ agency
<b>Denver</b>	Denver Regional Council of Governments (DRCOG)	Colorado Department of Transportation (CDOT)	Colorado Department of Public Health and Environment (CDPHE)	Regional Air Quality Council (RAQC)
<b>Houston</b>	Houston-Galveston Area Council (HGAC)	Texas Department of Transportation (TxDOT)	Texas Natural Resources Conservation Commission (TNRCC)	State AQ agency

<b>NONATTAINMENT AREA</b>	<b>METROPOLITAN PLANNING ORGANIZATION</b>	<b>STATE TRANSPORTATION AGENCY</b>	<b>STATE AIR QUALITY AGENCY</b>	<b>LEAD AGENCY FOR SIP DEVELOPMENT</b>
<b>Milwaukee</b>	Southeastern Wisconsin Regional Planning Commission (SEWRPC)	Wisconsin Department of Transportation (WisDOT)	Wisconsin Department of Natural Resources (DNR)	State AQ agency
<b>New York</b>	New York Metropolitan Transportation Council (NYMTC)	New York State Department of Transportation (NYSDOT)	New York State Department of Environmental Conservation (DEC or EnCon)	State AQ agency
<b>Northern New Jersey</b>	North Jersey Transportation Planning Authority (NJTPA)	New Jersey Department of Transportation (NJDOT)	New Jersey Department of Environmental Protection (NJDEP)	State AQ agency
<b>Philadelphia</b>	Delaware Valley Regional Planning Com. (DVRPC)	Pennsylvania Department of Transportation (PennDOT)	Pennsylvania Department of Environmental Protection (DEP)	State AQ agency
<b>Phoenix</b>	Maricopa Association of Governments (MAG)	Arizona Department of Transportation (ADOT)	Arizona Department of Environmental Quality (DEQ)	The MPO
<b>Portland</b>	Metropolitan Service District (Metro)	Oregon Department of Transportation (ODOT)	Oregon Department of Environmental Quality (DEQ)	State AQ agency
<b>Salt Lake City</b>	Wasatch Front Regional Council (WFRC)	Utah Department of Transportation (UDOT)	Utah Department of Environmental Quality (DEQ)	State AQ agency
<b>San Francisco</b>	Metropolitan Transportation Commission (MTC)	California Department of Transportation (Caltrans)	California Environmental Protection Agency (CalEPA)	Joint: Bay Area Air Quality Mgmt District, Assoc. of Bay Area Govts, and MTC

of the “official” process required in conformity SIPs and the relationships that have emerged in practice. Then the chapter turns attention to the role that nongovernmental stakeholders, particularly environmental advocacy groups, have played in conformity.

Finally, the chapter inquires whether conformity has had a wider impact by raising the public profile of transportation and air quality issues, educating the public, and increasing the likelihood that senior policy and elected officials would feel compelled to address these issues.

## Building Institutional Capacity

### *Contextual Conditions*

**CAAA.** The CAAA of 1990 transformed national regulation of air pollution. In doing so, it left state governments and regional agencies with numerous new policies to develop and politically controversial regulations to draft and adopt (many under tight time deadlines imposed by Congress), as well as with new on-going tasks to carry out.

For air agencies, conformity was merely one of several challenges in transportation competing for attention – and transportation policy was only part of the sweeping scope and workload created by the CAAA. Among other transportation duties, air agency mobile source staff had to prepare inventories and forecasts of emissions, develop mobile source emission control strategies in SIPs, and see that programs such as enhanced I/M, ECO, oxygenated and reformulated fuels, and gas pump vapor recovery were successfully

launched. State transportation departments and MPOs, for their part, had fewer new tasks to perform as a result of the new statute; but they recognized, some more quickly than others, that the CAAA had potentially profound implications for their policies, operations, and funding streams. Consequently, they had to devote far more attention to air quality issues, get a better understanding of the technical issues and workings of the regulatory system, and participate actively in policy debates over how pollution reductions could be accomplished.

While the states were charged with many new responsibilities, they were also left with significant uncertainty about precisely what complying with the CAAA would entail. As with most major national legislation, the new version of the Clean Air Act did not spell out in detail what all of its provisions required. Instead, it left EPA (in some instances, in consultation with DOT) responsibility for developing detailed federal regulations to implement statutory mandates, including but not limited to transportation conformity – an effort that took several years to complete. This meant that the full scope of new state responsibilities unfolded only gradually, even as statutory deadlines for proposing plans to reduce mobile-source pollution loomed ahead.

**ISTEA.** As demanding as the wave of change that the CAAA set in motion, implementation of ISTEA created a parallel set of pressures for the state and regional agencies in the conformity process. Congress enacted ISTEA in late 1991, and DOT elaborated its requirements in the metropolitan planning regulations issued in late October 1993, just before the conformity regulations were issued.

Among other effects, ISTEA:

- strengthened MPO authority to conduct the planning process and allocate federal funds;
- generally permitted greater flexibility in using federal funds to support the transportation system, but also created a new categorical program for projects with air quality benefits (the congestion mitigation and air quality improvement program or CMAQ);
- required a more frequent, systematic, analytic planning process that explicitly took account of new planning factors, including (but not limited to) air quality;
- required the development of a long-range transportation plan to be coordinated with the process for developing transportation control measures for the SIP;
- encouraged multi-modal planning and explicit project alternatives analysis;
- required the development of a set of six “management systems” for inter-modal facilities, bridges, pavement, public transportation, safety, and congestion;<sup>1</sup>
- reinforced the CAAA’s requirement that transportation investments be consistent with pollution reduction commitments that a state had made in its SIPs;
- mandated fiscally constrained trans-

portation plans;

- opened the planning process more widely to institutions that in many locales had previously been secondary participants (including local governments, ports and airports, transit operators, and air quality and economic development agencies);
- mandated more active efforts to involve the general public and non-governmental stakeholders (such as shippers and freight companies, and environmental advocates) in transportation planning.

As a result, at the same time that the 1993 conformity regulations were being implemented, ISTEA was reshaping the balance of power in metropolitan transportation planning and changing longstanding institutional practices. MPOs and state DOTs were redefining their own relationships in the transportation planning and programming process, in some cases tugging and hauling over who would take the initiative. Both felt pressure to enhance their technical planning and analytic capabilities. Simultaneously, because of efforts to increase participation in planning by the public, non-governmental stakeholders, and historically peripheral public agencies, MPOs and state DOTs were hearing more voices – some new, many louder – expressing visions of the purposes regional transportation networks should serve and how they should evolve. Throughout, MPOs and state DOTs were struggling to make politically difficult choices about regional priorities, as traditional transportation plans – often featuring so many projects that, in effect, they constituted “wish

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<sup>1</sup>Congress later made several of these management systems voluntary rather than mandatory.

lists” – were transformed into fiscally constrained plans.

State air agencies, for their part, had new opportunities to participate in and influence state and regional transportation decision making. To be effective, however, they had to learn how the planning process worked procedurally, develop expertise in the issues, and build relationships with other participating agencies and constituencies.

Against this backdrop of dramatic change in both air quality regulation and transportation planning, conformity posed significant challenges for the the key public agencies.

### **Organizing for Conformity**

**MPOs.** In each of the 15 study areas, an MPO is the key implementer of conformity. These MPOs are either single-purpose agencies established primarily to carry on regional transportation planning<sup>2</sup> or multi-purpose regional councils that may also conduct land use, economic, and environmental planning and regularly bring together senior officials of the region’s municipal and county governments.<sup>3</sup> MPO governing boards

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<sup>2</sup>These include the Boston MPO/CTPS, NYMTC in New York City, NJTPA in northern New Jersey, CATS in Chicago, the Mecklenburg/Union MPO in Charlotte, and MTC in the San Francisco Bay area (which also has some transportation operating functions).

<sup>3</sup>The multi-purpose regional councils are DRCOG in Denver, the BMC in Baltimore, ARC in Atlanta, MAG in Phoenix, Metro in Portland, H-GAC in Houston, SEWRPC in Milwaukee, DVRPC in Philadelphia, and WFRC in Salt Lake City. These organizations sometimes have a transportation policy committee that

are typically composed of local elected officials or senior transportation agency officials, sometimes joined by citizen members. Although MPO governing boards vote the *formal* conformity determination, they are rarely deeply involved in conducting or evaluating the actual analysis. That is primarily the responsibility of MPO professional staff.<sup>4</sup> A high-level staff member – typically the agency executive director or deputy director or the director of transportation planning – closely oversees the process. The actual transportation and emission modeling is generally performed or coordinated by a senior technical staff member, perhaps supported by another or several other technical professionals who work full- or part-time on conformity during the planning cycle. Some MPOs receive additional support from consultants, the state DOT, or the state air agency. In addition to conducting the technical analyses for conformity, the MPO typically organizes and coordinates interagency and stakeholder consultations either through specialized “technical” or “policy” committees or by soliciting agency comments, as will be detailed below.

**DOTs.** State DOTs in most states are also significant participants in conformity, even though the MPO is clearly the lead institution

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serves as the primary forum for transportation planning issues, so that the council’s full governing body deals in detail only with quite prominent transportation issues.

<sup>4</sup>The MPOs in the study, which are nearly all larger than average and include some of the nation’s largest, have full-time professional staffs ranging in size from about a dozen to about one hundred personnel. The Mecklenburg/Union MPO relies on the City of Charlotte’s Department of Transportation for its staff capacity.

in each study site. At a minimum, one or more DOT staff, generally reporting to a senior manager in the planning or environmental division, maintain liaison with MPO technical staff through regular bilateral meetings and telephone communications – and often by participating in MPO technical committees with representatives of other agencies.

Beyond this basic involvement, the role of state DOTs in conformity varies, depending on the institutional strength of the MPOs involved, the number of nonattainment areas in the state, and the degree of difficulty that MPOs encounter in satisfying the requirements of the regulations.

In a few study sites (e.g., Charlotte and northern New Jersey), the technical role of the state DOT is greater than in the typical case. Because the MPOs in these areas have only a few technical staff members stretched across a range of transportation planning functions, the state DOT directly supports the conformity process by providing data, giving technical assistance, and sometimes performing elements of the analysis. In states with multiple nonattainment areas (e.g., California, Utah, Illinois, Pennsylvania, North Carolina, New York, Texas), moreover, the DOT needs more in-house conformity expertise and technical capacity because it is likely to be managing all or a substantial part of the analytic workload of conformity for *smaller* areas. In some states with several *major* nonattainment areas (such as Maryland and Pennsylvania), the state DOT, often in conjunction with the state air agency, plays a significant inter-area coordinating role, helping MPOs in the major nonattainment areas exchange information and develop consistent conformity policies and technical

practices.

**AIR AGENCIES.** In most study sites, state air agencies perform statewide coordinating functions, contribute directly to the conformity technical work of MPO staff, participate in MPO policy discussions, and review and critique conformity analyses. In states with multiple nonattainment areas, air agency staff help coordinate conformity procedures and information for the agencies responsible for conformity in each area. State or regional air agencies typically maintain the MOBILE or EMFAC emission models for the nonattainment area,<sup>5</sup> in which cases they supply the emission factors for the conformity analysis.<sup>6</sup> They have also provided technical advice to MPO staff who work on conformity. In the course of drafting the conformity SIP, moreover, state air agencies typically have taken the lead in securing agreement on interagency consultation procedures, as will be described below.

**OTHER STATE AND LOCAL AGENCIES.** In most of the nonattainment areas in the study, other state and local agencies have been marginal participants in conformity. Only in Denver and the San Francisco Bay area are there regional air agencies that have been

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<sup>5</sup>Air agencies faced only modest start-up demands to perform transportation emission analyses. Most already had the modeling capacity in place, so they needed primarily to update as new versions of MOBILE or EMFAC were released.

<sup>6</sup>There are exceptions, however. In Arizona, for example, the MPO is also the lead agency for air planning; so it, rather than the state air agency, performs the emissions modeling. In Boston, the MPO also does the emissions modeling in house.

closely involved in conformity policy discussions. In some nonattainment areas, other agencies also provide specific data inputs for the transportation demand modeling that feeds into the conformity analysis. For example, the land use planning agency in Chicago has worked closely with CATS in developing land use forecasts; in the Bay area, MTC, the regional air agency, and the council of governments, which does land use planning, have closely collaborated; and transit operators in several locales (e.g., northern New Jersey and New York City) provide data and modeling capacity to MPOs. Most commonly, however, the perspective of other agencies is felt in conformity when one or more of their staff members sit on the consultative committees organized by the MPO.

**FEDERAL AGENCIES.** The federal agencies concerned with conformity have had varying degrees of involvement at the state and regional levels. FHWA is the only federal agency to have a permanent presence in each state, as well as regional offices responsible for groups of states. In states that have significant air quality problems, FHWA division (i.e., *state*) offices assign a staff member to work with MPOs and state DOTs on conformity and other air quality issues. Depending on the size of the division office and the number of nonattainment areas in the state, this staff person may work full-time on air quality issues or combine this task with other planning or environmental activities. FHWA's nine regional offices also have air quality specialists, generally full-time, who, among other duties,

work on conformity issues.<sup>7</sup> National-level FHWA staff in Washington, D.C., coordinate policy and consult on specialized technical questions.

EPA has also been closely attuned to the implementation of conformity. In a number of the 15 study sites, staff from one of EPA's ten regional offices have provided assistance to MPOs, state DOTs, and air agencies in understanding conformity requirements and carrying out technical analyses. EPA regional staff consult regularly with the agency's national headquarters staff responsible for conformity (who are based in Ann Arbor, Michigan) to exchange information and make sure that policy positions are coordinated. Unlike FHWA, however, EPA does not have field staff stationed in each state. Staff attention to conformity is therefore more widely spread, hence less intense in the typical case than FHWA's.

The CAAA assigns FHWA and FTA joint responsibility for the review and approval of MPO conformity determinations, but FTA has played a small role in most study sites. Like EPA, FTA has ten regional offices but lacks a state-level presence.<sup>8</sup> Typically, one of FTA's transit planners in each region spends less than full-time on conformity as a supplementary assignment. It is less likely, therefore, for FTA

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<sup>7</sup>The Transportation Equity Act for the 21<sup>st</sup> Century (TEA 21), enacted by Congress in 1998, eliminates funding for these regional offices. Their functions will be partially absorbed by division offices and by four new technical assistance centers.

<sup>8</sup>During the latter part of the period that this study covers, DOT was establishing metropolitan-level offices, including FTA personnel, in some large cities.



to be involved in routine conformity consultations. FTA staff members do contribute to discussion of specific transit-related questions – especially in areas like Chicago, New York, or San Francisco, that have major transit networks and spend substantial proportions of their federal funds for this purpose.

### ***Developing Technical Capacity***

**MPOs.** Conformity made significant and stressful start-up demands on MPO technical capacity and resources, beginning with the interim conformity guidelines in 1991 and intensifying once the 1993 regulations were issued. Most of the MPOs in the study were subject to the network modeling requirements of the 1993 conformity regulations,<sup>9</sup> and all needed to upgrade their modeling capabilities to meet the general requirements of conformity. Typically, MPOs had to hire additional in-house technical staff and/or consultants for this purpose. The types of improvements that study area MPOs instituted in their modeling and analytic capacity varied, but they included:

- updated input data for population, employment, and land use;
- new travel surveys;
- acquisition of new travel demand software – either through adaptation of standardized packages or customized development;
- increased model detail – e.g., to reflect time-of-day (rather than 24-hour or

peak/off-peak) assignments, arterial link capacities, signal-cycle variations at intersections, or volume-capacity curve variations;

- migration from a mainframe to a workstation or personal computer environment;
- installing or upgrading emissions modeling capabilities, including successive versions of EPA's MOBILE model and, in some cases, development of a post processor able to perform emissions analyses for alternative policy packages without re-running the full emissions model;<sup>10</sup> and
- adding feedback capabilities to reflect the effect of changes in land use, transportation capacity, and price on travel behavior – e.g., in terms of number and length of trips, mode share, destination choice, and time of day.

While conformity was often the decisive factor, these upgrades were also motivated by ISTEA's planning requirements and the provision of federal funds to strengthen planning capabilities. A number of MPOs reported that although they had significantly invested in developing transportation demand modeling capacity during the 1970s and early 1980s, they had made mostly incremental improvements during the remainder of the decade. ISTEA required regular updates of regional plans and explicit analysis of a rich set of plan-

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<sup>9</sup>This conformity requirement applied to all ozone and CO nonattainment areas classified "serious" and above.

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<sup>10</sup>Only a few of the MPOs in our study did emissions modeling themselves, relying instead on the state or regional air agency to mount and run the MOBILE or EMFAC model to provide emissions factors for MPO conformity analyses.

ning factors. This created workload and technical demands that many MPOs could not adequately meet. ISTEA, however, also increased the amount of federal funds available for planning; and conformity and other planning needs afforded justification for investing some of these funds in additional technical staff and modeling capacity. The pressures of CAAA and ISTEA compliance thus provided *opportunity* as well as *need* for enhancing technical capacity.

Most of the MPOs in the study now do transportation demand modeling in-house, although the smaller ones (e.g., Charlotte and northern New Jersey) sometimes procure assistance from consultants or the state DOT. Multi-purpose regional councils usually develop demographic, economic, and land use data and forecasts themselves, while single-purpose transportation agencies are more likely to rely on other regional or state agencies to supply this information. Most MPOs depend on the state air agency to carry the primary load in emissions modeling, although a few, including Boston's, have in-house capacity for emissions modeling. In Phoenix, unlike any other study site, MAG has been formally designated by the governor as the lead air quality planning agency for the nonattainment area, so it not only performs conformity analyses but also develops the area's SIPs.

During CAAA and ISTEA start-up, even though many MPOs generally regarded improvements in technical capacity as desirable, tight regulatory deadlines for new transportation plans, SIP development, and conformity – as well as active oversight and criticism by environmental advocates – made managing

these changes quite stressful for many MPOs. The tight timeframe did not seem adequate for the magnitude of the task, particularly given a short supply of skilled transportation modelers. Competition for their services was intense given simultaneous recruiting by similarly-motivated transportation (and some air) agencies. Alternatively, building the skills of current staff or procuring appropriate consulting services also took considerable time. The process of making modeling improvements – typically requiring interagency consultations, detailed design specifications, acquisition of software and/or programming, testing, and implementation – frequently had to be accomplished in several iterations over a period of at least two or three years.<sup>11</sup>

Of the 15 study sites, New York City and Chicago had the most difficult experiences. In the early 1990s, alone among the MPOs in the study areas, NYMTC had no comprehensive network-based transportation demand model in place, although New York's major operating agencies, such as the transit authority, had specialized modeling capacity for their own needs. The large task of developing a network model for the massive and complex New York region by the January 1995 conformity deadline – difficult enough – was

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<sup>11</sup>This study could not gather systematic comparative information about the monetary costs of upgrading MPO technical capacity to satisfy conformity requirements. Even if we had had direct access to budget data, our interview subjects had no ready way to separate conformity-related improvements from upgrades more generally prompted by ISTEA, to identify or account accurately for in-house costs (especially where personnel spent some, but not all, of their time on technical improvement activities), or clearly to separate capital investments for system development from operating costs.

complicated by a state-mandated hiring freeze that prevented NYMTC from securing adequate internal technical staff and by long delays in letting consulting contracts for model development. Not until mid-1997 was NYMTC's modeling capacity conditionally certified by FHWA for conformity analysis, pending further improvements by 1999. In Chicago, difficulties arose for quite different reasons. CATS already had an extremely complex, mainframe-based, network demand model – but one that could not flexibly accommodate the new kinds of analysis required by conformity. CATS initiated incremental improvements, the adequacy of which were sharply challenged by a coalition of local environmental advocacy groups, supported by experts working with the national Environmental Defense Fund. FHWA's division office also strongly encouraged further upgrading. As a result, over several years, CATS made ambitious, expensive enhancements to its models and collected much additional supporting data, including the land-use forecasts prepared by a sister regional agency. Litigation threats and the time pressure of making on-going conformity determinations during the maiden runs of new model sets added to the normal difficulty of implementing major innovations in technical practice.

In northern New Jersey and Baltimore, the process of technical capacity development coincided with a more general period of rapid staff growth and development. NJTPA, a new MPO which had a very small in-house technical staff, inherited some modeling capacity from NJDOT and NJ Transit, which it upgraded with consulting support. These improvements were vetted by an open public process, with significant participation by en-

vironmental advocates led by the Rutgers Environmental Law Center and affiliated with the Tri-State Transportation Campaign. Baltimore's newly reorganized MPO took over the technical resources of its predecessor, but used consultants to improve its models while simultaneously significantly increasing the size of its transportation planning staff. These efforts were spurred in part by questions raised about the adequacy of Baltimore's models by environmentalists during the interim conformity period.

MPOs in a number of other areas needed fewer changes or were able to upgrade their technical capacity with less difficulty. In the San Francisco Bay area, MTC had recently gone through an exhaustive litigation challenge to its modeling practices brought by the Sierra Club Legal Defense Fund in 1989.<sup>12</sup> The extensive model upgrades that MTC put in place as a result of settling the suit influenced the national policies reflected in the conformity requirements, and they positioned MTC to meet those requirements once the 1993 regulations were promulgated. Portland's Metro, with very strong in-house capabilities, refined a set of models that already had been significantly adapted to deal with air quality and land use issues. Boston's CTPS, which welcomed the overall improvements in planning capability prompted by CAAA and ISTEA, upgraded its models for conformity primarily with in-house staff. In Phoenix, MAG retained consultants to help it develop

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<sup>12</sup>See Mark Garrett and Martin Wachs, *Transportation Planning on Trial: The Clean Air Act and Travel Forecasting* (Thousand Oaks, CA: Sage Publications, 1996) for a detailed analysis of the Bay Area situation.

modeling improvements over several years – as did H-GAC in Houston and ARC in Atlanta.

**STATE AGENCIES.** Compared to MPOs, state DOTs faced less conformity-related pressure for technical capacity enhancement. Most had stronger technical capabilities to begin with, and the areas for which they take primary analytic responsibility are usually smaller ones that can utilize less complex methods.

For state air agencies, by contrast, developing necessary technical resources was far more challenging. As noted above, conformity was merely one of several types of new transportation tasks that the CAAA set before state air agencies, each competing for staff attention and resources. To meet the spate of new responsibilities, most air agencies hired additional staff members who had or could develop transportation expertise, but this took time; and new staff had to be assimilated to new institutional practices and cultures. A few state air agencies (notably in Texas and North Carolina) developed in-house transportation modeling capabilities, so they would understand better what MPOs and/or the state DOT were doing and have some independent ability to assess policy alternatives.

**FEDERAL AGENCIES.** Both the U.S. Environmental Protection Agency and the U.S. Department of Transportation contributed to the development of organizational capacity for conformity by providing technical assistance. In a number of areas, MPO and air agency staff members praised EPA regional office staff – for example, in Denver and San Francisco – for assistance in understanding conformity requirements and carrying out

technical analyses during the early phases of implementing the 1993 regulations. FHWA divisional staff also provided a great deal of information to MPOs, state agencies, and other stakeholders, helping them understand what conformity required and how it could be done. National headquarters staff mounted some more extensive technical assistance efforts – e.g., to help Denver and Atlanta deal with conformity difficulties.

## **Establishing Interagency Consultation Procedures**

Since in all states the planning and operating responsibility for transportation and air quality policies is dispersed among many individual public agencies – state, regional, and local – the conformity regulations emphasized the need for effective interagency consultation at each stage of the conformity process. Consultation practices have emerged gradually as first the interim conformity guidelines and then the 1993 regulations have been implemented.

### ***Start-up Issues***

As discussed, the early years of CAAA and ISTEA implementation were fraught with challenges. As new and sometimes competing demands were placed on transportation and air quality agencies, many struggled to understand and implement their broadened roles and responsibilities, notably those imposed by conformity. Given the turmoil of the start-up phase, it is not surprising that the first round of

air quality and transportation planning did not occur in an idealized manner. As each group grappled with its own challenges, transportation and air quality planners did not always realize the importance of consultation and place it high on their list of priorities. Also complicating the start-up of consultation procedures was a delay in development of the federal conformity rule, which contains the most powerful inducements for interagency cooperation. Initially slated for publication in 1991, EPA instead issued interim guidance that left many important issues to be resolved in negotiations with DOT and various stakeholders. The federal rule was not completed until November 1993, concurrent with the deadline for 15% VOC reduction SIP submittals (in ozone nonattainment areas) and the first post-ISTEA transportation plan revisions in many areas.

As a result of start-up challenges, many areas missed the window of opportunity for consultation that could have informed the first set of SIPs in the CAAA/ISTEA era. In a few areas, such as Boston, Houston and Milwaukee, broad-based SIP planning task forces were established through which all actors came to the table (including both public and private interests from mobile, stationary and area sources) to evaluate various strategies for reducing emissions within each source category; to consider carefully the trade-offs among mobile, stationary and area source controls; and thus to set budgets with an understanding of their future implications. In other areas, air quality agencies dealt with each emission source category separately. In these areas, transportation planners were generally a party to TCM decisions and in some were involved in discussion of other mobile

source measures and emission budgets. As will be discussed below, however, transportation planners in several areas were not sufficiently aware of the importance of their involvement in SIP planning. Thus, budgets were derived implicitly from SIP inventories without enough consideration of their implications for future conformity determinations.

Likewise, during the start-up phase, air planners were just beginning to establish their role in transportation planning. They were jockeying for a voice in the MPO, learning transportation issues and planning processes, and had not yet begun to negotiate the formal consultation procedures that would be solidified through the states' conformity SIPs. Moreover, because most MPOs and state DOTs had a project backlog that had already gone through years of planning and had strong support from local governments and interest groups, it was quite difficult politically to influence transportation priorities in the short run. As a result, air planners frequently felt that they had too little influence on the first post-ISTEA round of transportation plans and TIPs.

### ***Formalizing Consultation Procedures in a Conformity SIP***

Part of the conformity SIP that each state was required to develop by November 1994 involved interagency consultation procedures. Wide state-to-state variation in institutional structure, however, made it impossible for the federal conformity regulations to prescribe specific arrangements for interagency consultation, as they did for some other conformity procedures. In drafting its conformity

SIP, therefore, each state had to specify a customized set of policies:

- defining the roles and responsibilities of each participating agency;
- establishing general procedures for meetings, distribution of information, and opportunities for comments;
- indicating how certain conformity-specific tasks would be accomplished – e.g., selecting transportation and emission models, defining “regionally significant” projects, identifying exempt projects, and determining the timeliness of TCM implementation;
- specifying how the public would be involved in reviewing and commenting on conformity determinations; and
- establishing a mechanism for resolving interagency conflicts.

Typically led by the air agency, concerned agencies in most states began working on conformity SIPs in 1994. Although the schedule for submission of these SIPs did not stay on track (as will be explained below), many states finished work essentially within the allotted year, building on the experience gained in their initial conformity experiences. Most developed interagency consultation procedures with little disagreement, and a number regarded the exercise of specifying responsibilities and defining processes as quite useful in clarifying expectations about how conformity would be carried out.

Although the 1993 conformity regulations explicitly permitted states to adopt conformity procedures that were more stringent than the

federal requirements, many states were either barred by state statute from exceeding federal environmental requirements or faced an informal – but powerful – legislative bias against doing so. Of those that legally could impose stronger requirements, few chose to do so. Oregon made its conformity practices stronger than the requirements in several respects. Massachusetts also went notably beyond the federal rule, requiring state air agency concurrence with the MPO’s conformity determination.

In a few states, drafting the conformity SIP became a matter of serious contention between the MPO and other participants. In Utah, the state DAQ initially drafted a conformity SIP based on a model developed by STAPPA/ALAPCO, a national organization of state and local air pollution officials, which, among other provisions, gave the environmental agency a veto over conformity determinations. For its part, the Salt Lake City MPO insisted on minimal oversight of its conformity decisions. The two agencies were therefore unable to reach agreement on conformity procedures.

In Colorado, the state Air Pollution Control Division (APCD) and CDOT jointly led an intensive interagency discussion about procedures to be incorporated in the Colorado conformity SIP. This involved participants statewide, not only those concerned with the Denver area.<sup>13</sup> APCD sought a state

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<sup>13</sup>In addition to APCD and CDOT, other attendees included representatives from all Colorado MPOs, two members of the state Air Quality Control Commission (AQCC), several environmental advocates and business representatives, and a few unaffiliated citizens.

conformity procedure that specified in detail how the consultation process should work. Taking an opposite tack, DRCOG advocated prescribing as little procedural detail as possible to satisfy the conformity mandate. This would have left more discretion to individual Colorado MPOs to decide how to comply. The policy discussions were constrained by a state law that forbade adopting regulations that were more stringent than required by federal law. After long, detailed negotiations, APCD and CDOT eventually reached consensus, despite the unhappiness of DRCOG, the Denver MPO. DRCOG was particularly dissatisfied with a provision that specified that members of interested advocacy groups would be permitted to attend all meetings relating to conformity, along with agency representatives. The negotiations about the Colorado conformity SIP coincided with an intense debate about whether the Denver  $PM_{10}$  emission budget should be increased to solve the area's conformity difficulties, which was ultimately settled by the state legislature. (These events are described in more detail in Chapter 3.) Before the conformity SIP was formally adopted, DRCOG and some business interests indicated that they would seek changes in the draft conformity procedures through an appeal to the legislature. APCD then decided to postpone action on the conformity SIP.

Such indeterminate outcomes could remain unresolved because the original schedule for finalizing conformity SIPs was placed on hold nationally. Conformity SIPs were initially supposed to be submitted for EPA approval by November 1994, one year after the 1993 conformity rule was issued. By early 1995,

with some state submissions complete and others still outstanding, the conformity "scene" was changing at both the national and state levels. In response to strong concerns raised by the National Governors' Association about the inflexibility and burdens of conformity, EPA had embarked on national consultations about how to refine the conformity rule. It was clear that a set of amendments to the November 1993 rule would be forthcoming, which might affect the specific procedures set forth in the state conformity SIPs. As a result, EPA relaxed enforcement of the deadline for submission of conformity SIPs, pending completion of what were ultimately the August 1997 amendments to the conformity regulation. These amendments set a new one-year schedule for submission of conformity SIPs – by August 1998.

As of the end of 1997, therefore, conformity SIPs for most states in the study were not yet in final form. Arizona, California, Georgia, Maryland, Massachusetts, North Carolina, and Pennsylvania had submitted SIPs but then accepted EPA's offer to defer formal action. This deferral left these states the option of amending their submissions once the 1997 amendments were promulgated without having to go through the full state regulatory process once again. Some other study states – Colorado, Illinois, New York, New Jersey, and Utah – suspended SIP development before their regulations were ready for submission to EPA. These states therefore had to restart the process once the 1997 conformity amendments were issued. By contrast, Oregon, Texas and Wisconsin submitted conformity SIPs to which EPA gave formal approval – a fact the last two states came to regret since it meant that their

SIPs would remain in effect until they developed, submitted, and secured federal approval for revisions after the 1997 amendments were issued. Oregon, however, requested EPA approval so that the provisions that exceeded federal requirements would be legally binding.

### ***Interagency Consultation in Practice***

Whatever the legal status of their conformity SIPs, the study areas have developed interagency consultation practices that go well beyond previous levels of interaction. In most, communication between transportation and air agencies was minimal before the CAAA of 1990 and ISTEA; in some, virtually non-existent. Consultation began to increase in response to the initial requirements to develop SIPs and revise transportation plans. Conformity was another major spur beginning with the interim conformity guidelines and followed by the early stages of implementation of the 1993 federal conformity rule, when all involved were struggling to understand the meaning and nuances of the complicated regulations.

These emerging relationships have led to improved relationships in *all* of the study sites. But this development has been uneven in its pace and extent across areas, and important limitations remain.

**REGIONAL AND STATE AGENCIES.** As agencies in each study area have gained more experience with conformity, consultation processes have evolved and generally deepened.

In virtually all 15 study sites, the MPO is the organizer and focal point for interagency and stakeholder consultations on conformity. At a minimum, MPOs organize meetings of the key agencies and circulate planning documents for comment as the transportation planning cycle proceeds.<sup>14</sup> Beyond this, a number of MPOs (e.g., in New York, Houston, Atlanta, Denver, and Chicago) host “technical” committees that meet periodically during the planning cycle and more frequently when new regulatory issues are being addressed or problems arise. In some cases the technical committees existed before the conformity requirement and have expanded their membership and functions in response; in others, they are newly organized. These groups are typically composed of a mixture of technical and policy officials from concerned regional, state, and federal agencies, including air and transit agencies, FHWA, and EPA. Sometimes nongovernmental stakeholder groups sit on these committees or attend as observers. Among other activities, the technical committees may address transportation planning assumptions, modeling upgrades, specific project implementation issues, and interagency coordination problems – as well as the ultimate conformity determination.

Consultation goes beyond the mechanics of conformity in most, but not all, areas. Air agencies now typically participate in some fashion on the MPO committees where transportation decisions are made, so they have an opportunity to make suggestions or raise issues at a formative stage of policy development. Air quality planners have occasionally

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<sup>14</sup>For Charlotte, the state DOT and MPO both play key roles.



secured formal powers in transportation decisions. For example, in Boston the conformity SIP includes provisions for DEP concurrence on conformity determinations and DEP's inclusion in determining the eligibility of CMAQ projects. On the other side, transportation planners in many areas are brought into the air quality process through joint committees or task forces that deal with SIP development and issues such as TCMs and CMAQ. In most areas, consultation has opened the door for both transportation and air quality planners to be involved much earlier and more deeply in cooperative efforts.

Official interactions, however, tell only part of the story of interagency consultation. As interviews conducted for this study amply revealed, *formal* consultation procedures have frequently helped to foster stronger *informal* working relationships and deeper understanding of the issues in a number of areas. Where such relationships have developed, they are characterized by frequent informal communications across agency lines, not merely distribution of documents and convening of official meetings.<sup>15</sup> Agency personnel discuss

conformity progress and problems, exchange data and information, provide advice to each other, and strategize about dealing with stakeholders and other agencies. For example, in Portland, state air agency and Metro staff have worked extremely closely on transportation and air quality issues, along with significant involvement by the state DOT. Similarly, in Boston, MPO, air agency, and state DOT staff have worked quite closely on modeling issues and development of transportation and air quality policies. In Denver, despite policy conflicts, there has been close collaboration between DRCOG and the regional air agency, on one hand, and the state air agency and DOT, on the other; as well as frequent interchanges between regional and state agencies. In the San Francisco Bay area, there is also strong collaboration between MTC and the regional air agency and active consultation with the state agencies.

As a result of such contacts in these jurisdictions and others, increased professional intimacy and trust developed among the individuals who participate in the conformity process. Many of the state and regional offi-

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<sup>15</sup>The formation of both formal and informal consultation patterns seems to be facilitated or impeded by an important contextual factor – the proximity of agency offices. Geographic separation of the state capital (where the state DOT and air agency are headquartered) and the home of the MPO (usually in or near the central city of the nonattainment area) can pose an obstacle – but by no means an absolute barrier – to strong interagency consultation. When state agency headquarters are at a sufficient distance from the MPO offices (and those of other involved regional agencies) to make traveling to meetings time-consuming, inconvenient, and expensive, consultation tends to be less frequent, more formal, and more likely to occur with some agencies absent. This is the case, for example, for New York City/Albany, Charlotte/Ral-

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leigh, Philadelphia/Harrisburg, and Chicago/Springfield. By contrast, where the key agencies are located in the same city – e.g., in Atlanta, Boston, Denver, Phoenix, Salt Lake City – or where the travel between the state capital and the central city of the metropolitan area is relatively convenient – e.g., between Baltimore/Annapolis, Portland/Salem, Milwaukee/Madison – it is easier for key staff to get together for meetings and to confer informally. The relatively limited degree of agency consultation in Salt Lake City and Phoenix, it should be noted, indicates that geographic proximity is not a sufficient condition for the formation of strong relationships. It seems to encourage, but not guarantee, more intensive consultation among state and regional agencies.

cially interviewed for the study stressed that, as a result of the formal and informal relationships that conformity has spurred, they have developed a much greater understanding of their counterparts' challenges and the constraints that shape their policy approaches, making it far easier to acknowledge problems and work together to solve them. Consultative relationships, once initiated, therefore tend to become reinforcing. Contacts that prove useful in one instance persist, often deepen, and become routine. New employees of one agency meet and get to know their counterparts at others, if their peers' relationships have gotten well-established. Because consultation is a utilitarian activity, however, the ebb and flow of the work cycle naturally affects the intensity of these relationships. The need to produce a "product" such as a SIP or transportation plan or program, tends to intensify the relationships; the periods between such efforts may display less interaction.

These findings about the development of closer regional and state agency relationships must be qualified, however, in certain important respects. Even where close interagency relationships develop, they do not transcend or submerge distinct institutional interests and perspectives in conformity. Nor do they fundamentally change disparities of bureaucratic or political power. Agency personnel continue to represent their own agencies and may not always be able to find common ground with their counterparts on specific matters. Interagency tensions continue to exist, and serious disagreements can erupt periodically. This was certainly true in Denver, where disagreements about the  $PM_{10}$  emission budget and the conformity SIP, among other issues, have di-

vided the concerned agencies.

In some areas, moreover, consultation is relatively limited and focused to a great degree on formal interactions such as committee meetings, review of proposed conformity determinations by air quality planners, and comments by transportation planners on proposed SIP budgets or mobile source control measures. In these areas and some others, there seems to be far less advance discussion of issues, less informal give and take, more turf protection and focus on each agency's exclusive objectives, and – quite significantly – less reciprocal trust at the agency and personal levels.

No single explanation accounts for these situations, which include Phoenix, Salt Lake City, and New York. They stem from past institutional and personal relationships, differing perceptions of individual agency interests, and conflicting constituency pressures. In Phoenix, for example, MAG has played an important part in supporting an extensive regional road building agenda, which has strong political support from MAG's municipal government members. At the same time, MAG's role as both MPO and lead agency for SIP planning - has given it responsibility for most modeling, analysis, and policy making. Neither the air agency nor state DOT matches MAG's technical expertise in these areas; as a result, MAG engages in less interagency consultation than many other MPOs. The state air agency, in particular, regards MAG as insular and is suspicious of its commitment to air quality goals. In Salt Lake City, conflict between the MPO and air agency has arisen over several issues,

resulting in poor relationships among some key staff, mutual suspicions, and limited dialogue. In New York, the air agency and state DOT have had a wary relationship during most of the period covered by the study, differing significantly during national discussions about the 1993 conformity regulations; both have also been bureaucratically insular in carrying out their responsibilities under the CAAA and ISTEA. Although NYMTC is closely tied to NYDOT, it has a highly decentralized structure of regional committees, which creates more participants to consult and more organizational layers to coordinate; and its difficulties in complying with the network modeling requirements of the 1993 regulations have focused it more on internal matters than on interagency collaboration.

Poor interagency communication can make dealing with conformity problems more difficult than they otherwise would be, as evidenced by Charlotte's situation in 1997 when conformity lapsed. As the deadline approached, there were extensive consultations among planners in the MPO, air agency, and state DOT. Through these discussions, MPO staff believed that the air agency would revise the emission budget to accommodate higher levels of mobile source emissions, as the transportation planners had requested. The air agency decided not to revise the budgets but apparently did not adequately communicate this position to the MPO, which continued to hope for several months that this was a viable option. Similar communication problems between the MPO and air agency arose in Atlanta as its lapse loomed in 1997 – in this instance about possible additional emission control measures. Georgia DOT also controlled much of the

communication between itself and the MPO, on one side, and FHWA and EPA, on the other. Whether or not better communication would have sufficed to “solve” the conformity problems in Charlotte or Atlanta – and it probably would not have – communication problems wasted time that would have been better spent in more direct discussions about how to respond to the conformity lapse.

Even in areas where strong consultative relationships have developed, important limitations remain. While state air agencies provide important technical inputs to conformity analysis in a number of study sites, they have generally been *reactive* rather than proactive participants in conformity. Resource limitations and the opportunity costs of using this scarce capacity for conformity are a major barrier. Compared to the period prior to implementation of CAAA of 1990, air agencies have built up significantly more staff expertise and experience in transportation. But the improvement does not fully meet current demands. Most air agencies still have too few staff members to deal with the wide range of mobile source issues; given their many tasks, they feel perpetually short-staffed. So conformity must compete with other priorities, including some, unlike conformity, on which the air agencies must take the lead, particularly SIP development. Many air agencies in the study report that staff workload and shortage of technical expertise prevent them from being as deeply involved in conformity as they otherwise might like.

Moreover, because a number of air agencies have little in-house technical expertise on transportation demand modeling, they are

uncomfortable probing that dimension of conformity even when they have serious reservations about how the MPO is handling it. They participate in MPO technical committees, usually speak regularly with MPO staff on a bilateral basis, and may raise questions in official comments on conformity analyses. Rarely, however, do they seriously challenge MPO technical conclusions.

State bureaucratic politics shapes this result as much as resource scarcity. Many air agency officials interviewed for this study described their work on conformity in ways that implied the following perspective: Conformity focuses on issues at the heart of the policy domain of powerful political interests. Transportation projects often have strong constituency backing – e.g., local governments, business interests, economic development organizations, construction firms and unions. The governor, legislators, and local elected officials pay close attention to these issues and constituencies. As a result, state DOTs (and the MPOs with which they are allied) are among the most politically influential agencies in state government. By contrast, air agencies confront a wide range of potentially controversial matters in addition to transportation; and they are typically subunits of state environmental departments, which have even broader regulatory agendas. Air agencies consequently must “pick their fights” carefully. Conformity rarely seems a promising battleground. Disputes have the potential to disrupt the flow of federal funds and typically relate to the transportation models about which air agencies have less claim to expertise than their transportation counterparts. The points of contention, moreover, focus on technical questions that are either dif-

ficult to explain to generalist officials (e.g., the arcana of modeling practice) or seem excessively theoretical (e.g., forecasted emissions budget exceedances two decades in the future).

Although such views of political and bureaucratic reality do not preclude challenges to MPO conformity determinations, they are cautionary. Air agencies therefore seek influence in conformity mainly through “front-end” participation on the interagency committees that discuss planning assumptions and modeling changes, in regular communication and information exchanges with their counterparts in the transportation agencies, and, to a lesser degree, by comments on completed conformity analyses. When difficulties demonstrating conformity arise, air agencies usually advise on ways to reduce or mitigate transportation emissions, interpret federal regulatory requirements, and serve as intermediaries in negotiations with EPA regional staff. In only a few instances identified in the study sites have air agencies been aligned against transportation agency positions in major conformity disputes – most notably, when DRCOG sought an increase in the  $PM_{10}$  budget for Denver.

**FEDERAL AGENCIES: FHWA.** In a number of study sites FHWA personnel are more tightly integrated into the conformity network than their counterparts in either EPA or FTA. In each state in the study, FHWA has division offices in the same city in which the state DOT headquarters are located. Therefore, its air quality staff members have relatively direct access to their counterparts in state and regional agencies. In all of the research sites, FHWA divisional staff participate regularly in

MPO technical committees and/or speak regularly with MPO professional staff, helping to establish the necessary data inputs and analytic parameters of the MPO's transportation demand models and procedures for conformity determinations. This involvement usually allows them to become aware of difficulties and potentially controversial analytic choices; to establish working relationships with key participants from other state, local, and federal agencies and non-governmental stakeholder groups; and sometimes to proffer advice about how troublesome conformity issues might be handled.

In a regulatory role, FHWA staff members approve MPO conformity determinations. At an initial stage, they assess whether the formal conformity determination adopted by the MPO fulfills basic requirements – e.g., satisfying the regulations about modeling procedures, passing the quantitative conformity tests, showing that TCMs are being implemented, and demonstrating that transportation plans are fiscally constrained. While this initial review typically “checks off” compliance rather than intensively evaluates the quality of the MPO's analysis, it has occasionally revealed problems that delay approval of the conformity determination. In Boston, for example, FHWA staff, with the agreement of FTA, put conformity on hold in 1994 while dealing with the question of fiscal constraint of the state TIP.

FHWA staff members also solicit comments on the conformity determination from their federal partners, EPA and FTA, and consider comments from interested stakeholders (most often environmental advocacy groups). Serious objections typically trigger intensive

review of the MPO's conformity analysis. In this process FHWA division staff members play a facilitative role as well as an evaluative one. A response to the criticisms is sought from the MPO. If the disagreement is not readily settled, FHWA staff members typically convene meetings at which the interested parties discuss their positions. In some instances (e.g., in Chicago during early implementation of the 1993 regulations), repeated consultations are necessary to work out differences or determine that an impasse exists.

Within the FHWA hierarchy, the division offices take the lead in reviewing conformity determinations. When the issues raised are primarily local – e.g., questions about how specific projects should be modeled or whether certain input data is adequate – the division office typically has the decisive voice in approval, with the regional office primarily providing information and general advice rather than exercising tight oversight. Some issues have “policy” implications, however – for example, if they require an interpretation of federal regulations that might set a precedent for other areas or if decisions in other nonattainment areas are cited as justification for MPO actions. In these cases, regional staff typically play a larger role, including coordinating with EPA's regional offices and FHWA headquarters.<sup>16</sup> FHWA headquarters staff provide technical backup, interpret

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<sup>16</sup>These relationships are likely to be changed by the realignment of FHWA field functions that Congress enacted in 1998 in the new Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), which succeeded ISTEA as the nation's transportation funding authorization legislation.

agency policy, promote inter-area consistency, and manage liaison with EPA headquarters staff.<sup>17</sup>

Although FHWA, acting in conjunction with FTA as DOT's representative, has the ultimate authority under the CAAA and the 1993 conformity regulations to decide whether the conformity determination should be accepted, it has typically imposed its own judgments only when conciliation efforts have not succeeded. In regard to modeling, for example, FHWA has pressed MPOs for change but has been willing to accept iterative improvements over several planning cycles if the MPOs have been able to institute basic changes more quickly. In Chicago, for example, FHWA delayed approval of the area's conformity determination in 1994, requiring CATS to conduct extensive further analyses; but although it pressed CATS to institute changes in modeling practice as advocated by a coalition of environmental groups, FHWA did not ultimately withhold conformity approval until these changes were fully instituted. In New York, failure to meet conformity's network modeling requirements is one reason why the MPO was unable to adopt a new TIP for several years; but when an initial operating model was finally ready in 1997, FHWA accepted the MPO's commitment to further upgrading in subsequent planning cycles. Such decisions have not always pleased stakeholders, particularly environmental advocacy groups which have some-

times wanted more pressure on MPOs to upgrade their modeling practices or change their transportation policies.

The conformity regulations give DOT the final authority to decide whether an area's conformity determination should be certified. In practice, FHWA has taken the lead; but the agency has generally worked closely with EPA and FTA to reach consensus on a federal position, sometimes managing discussions at multiple levels of the agencies. In only one instance in the study sites, however, has there been severe disagreement between FHWA and EPA. (The situation in Atlanta was described in Chapter 3.)

**EPA.** Regional office staff members have played active roles in implementing conformity – providing technical assistance, troubleshooting on major issues, advising and consulting with national headquarters staff, working with states and MPOs to develop conformity SIPs, and dealing with the conformity consequences of control strategy SIP revisions or disapprovals. Nonetheless, EPA's involvement in conformity at the MPO/nonattainment area level has been significantly more variable – and weaker overall – than FHWA's. Because EPA lacks a state-level presence equivalent to FHWA's divisions, its attention is more widely spread. The two or three mobile-source specialists in each EPA regional office often have many competing demands on their time, including SIP development and programs such as reformulated or oxygenated fuels, I/M, and, in the early years of CAAA implementation, the Employee Commute Option (ECO) program. With a multi-state purview, moreover, not the single-state focus of FHWA division personnel, EPA regional

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<sup>17</sup>FHWA headquarters staff, on behalf of U.S. DOT, also coordinates FHWA, FTA, and the Office of the Secretary's ideas and comments on proposed EPA regulations for which the statute requires concurrence between EPA and DOT.

staff often have responsibility for a half dozen or more major nonattainment areas, as well as additional smaller ones. Given the small number of EPA regional personnel responsible, managing work flow is problematic. Transportation planning cycles, roughly synchronized with the federal fiscal year, may simultaneously hit key periods in several nonattainment areas; and the demands of transportation planning may overlap with peak periods of SIP development.

Achieving equally detailed familiarity and sustained contact with every nonattainment area is thus quite challenging. Each has different air quality and transportation problems, varying institutional structures, and numerous agency staff and stakeholders with whom to establish consultative relationships. Geographic distance and travel time from the regional office vary but are frequently substantial. While a number of MPOs have welcomed EPA participation in area-level planning, moreover, not all have been equally forthcoming.

All things equal, EPA regional staff are more likely to be deeply involved in conformity in those cities in which its regional offices are located. Travel is minimized, informal contact is more regular, detailed knowledge is greater. In areas removed from the regional office site, EPA staff have experienced more difficulty participating as a result of distance and limited travel budgets (which was especially problematic during several early years of conformity implementation). Thus, EPA staff members based in Region IV in Atlanta have been closely involved in that area but have been less active in Charlotte, also part of Region IV.

Overall, these circumstances seem to have greatest impact on EPA participation in the less formal, more routine (but nonetheless formative) aspects of the conformity process – e.g., the work of MPO technical committees discussing modeling improvements or the parameters of analysis. When EPA staff are not based in the nonattainment area, their infrequent personal visits and bilateral telephone contacts do not fully compensate for the knowledge and personal relationships that regular participation in these groups engenders. It is therefore more common to hear MPO or state DOT staff involved with conformity say that they do not know or are only slightly acquainted with EPA staff than to hear these people or air agency staff say the same about FHWA division staff. Some have come to regard EPA as a “regulator” more concerned with the formalities of the law than as a “problem solver.”

EPA regional staff have tended to concentrate their efforts on fulfilling requests for technical assistance, coordinating with FHWA staff, and reviewing MPO conformity determinations. Even the latter work, regarded as highly important, can be squeezed by time and resource pressures. Final review and comment on conformity determinations must be completed on a tight schedule, typically 60 days or less. In a number of EPA regional offices, moreover, none of the responsible staff have in-depth experience with transportation demand modeling, which reduces their ability to probe MPO work critically. EPA regional staff have pressed MPOs to improve their modeling, but they have tended not to raise formal objections to MPO practices unless some other agency or stakeholder has done so.

Given the volume and diversity of their workload, EPA regional staff must, of necessity, pick and choose priorities for attention. In the typical case, they have deferred to FHWA judgment on transportation modeling. The amount of contact between staff of the two agencies appears to be substantial, and generally effective “partnerships” have developed at the regional level. While in some cases EPA staff would have liked to see FHWA be more aggressive in challenging MPOs, only in Atlanta has there been strong disagreement between the agencies.

EPA’s mobile source headquarters staff, based in Ann Arbor, Michigan, played the lead role in drafting the transportation conformity regulations and the subsequent amendments (in close consultation with DOT, whose concurrence was required by the statute). It has also played a continuing role in interpreting the regulations, coordinating regional office mobile source specialists to ensure national consistency, and has communicated regularly with state and regional transportation and environmental agencies and other stakeholder groups. The EPA and FHWA headquarters staffs responsible for conformity have forged a close working relationship, which has facilitated relationships between their respective field staffs and with stakeholders as well as encouraged forthright discussions of policy differences that have arisen in conformity implementation.

**FTA.** Like EPA, FTA has ten regional offices but lacks a state-level presence, which creates the same difficulties of travel to and communication with the several nonattainment areas in each region. FTA’s regional offices

have far fewer staff overall than EPA’s, moreover, which means FTA faces even more severe personnel constraints in dealing with conformity. FTA staff do contribute to discussion of conformity questions—especially in areas like Chicago, New York, or San Francisco, that have major transit networks and spend substantial proportions of their federal funds on this purpose. In the typical case covered by this study, though, FTA regional offices sign-off on conformity determinations, usually deferring to FHWA’s more in-depth review of the issues. The new metropolitan offices that DOT is currently opening in some major cities, which will have both FHWA and FTA staff, may make it possible in the future for FTA to be more deeply involved.

## Stakeholder Participation in Conformity

The conformity regulations require both that the public have opportunity to comment on conformity analyses before the determination is made and that MPOs fulfill the requirements of the DOT metropolitan planning regulations, which more generally mandate public participation in transportation planning. Using these paths of access, environmental advocacy groups have been the most active nongovernmental stakeholders in conformity, playing key roles in about one third of the 15 study sites and a more limited role in most others. Business associations are the only other stakeholder group active in conformity—and then only in a few nonattainment areas.



## **Environmental Advocates**

Environmental advocacy groups have been significant conformity participants in a number of the 15 study sites. In several areas, they have pressed MPOs hard to upgrade transportation modeling practices, monitored (and sometimes challenged) the results of conformity analyses, and used conformity discussions as a forum to advocate alternative regional transportation and land use policies. In some areas, they have become well-integrated participants (as official members or regular observers) in the MPO technical committees that structure and review the area's conformity practices, sharing in the informal discussion and information exchange; in others, they have gained less intimate, more formal access through public participation procedures. Wide disparities exist among areas, however, in the resources and expertise that environmental advocates can mobilize (and choose to use) to influence the conformity process.

In several study sites, described briefly earlier in this chapter, environmental advocates have played prominent roles in the development of conformity practices. In the San Francisco Bay area, for example, the Sierra Club Legal Defense Fund, in alliance with other groups, successfully brought suit against the Metropolitan Transportation Council, the area's MPO, challenging the adequacy of its transportation demand modeling procedures to forecast the air quality effects of transportation projects.<sup>18</sup> Initiated before the CAAA of 1990

was passed but not fully resolved until several years after, the debate and resolution of the MTC suit helped shape Congressional action and the 1993 federal conformity regulations. Subsequently, the Sierra Club (not the independent Sierra Club Legal Defense Fund) has continued to provide support for a loose coalition of San Francisco area environmentalists who have pressed the MPO to accord greater attention to transportation plans based on tighter land use regulation.

Another example is Denver, where a coalition of local environmental groups – which also has strong ties to the Environmental Defense Fund (EDF) and other national environmental advocacy organizations – has been extremely active. This coalition has closely monitored DRCOG's conformity practices, lobbied for modeling improvements, participated energetically in discussions about transportation priorities (including pressing for action on transit proposals), helped secure commitments during the interim conformity period for environmental mitigation of the E-470 toll road project in anticipation of possible future conformity difficulties, and fought hard (but ultimately unsuccessfully) to prevent changes in the area's PM<sub>10</sub> emission budget.

In Chicago, a coalition of local environmental groups, aided by technical experts affiliated with EDF, effectively pressed the Chicago Area Transportation Study (CATS) to institute major changes in its transportation demand modeling practices. With less success, these groups have sought changes in the area's

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<sup>18</sup>See Garrett and Wachs, *Transportation Planning on Trial: The Clean Air Act and Travel Forecasting*.

transportation policy priorities. In Baltimore, the Chesapeake Bay Foundation and EDF raised serious questions during the interim conformity period about the adequacy of MPO modeling practices, which helped spur significant upgrading. Also during the interim conformity period, several environmental groups in North Carolina (including the Sierra Club, the Conservation Council of North Carolina, and EDF) negotiated with state agencies to include all transportation projects, whether or not federally funded, in the conformity analysis; they also pressed the state to agree that the state would perform NO<sub>x</sub> conformity tests, whether or not the federal conformity regulations required this. In northern New Jersey, advocacy groups affiliated with the Tri-State Transportation Campaign, supported by staff from the Rutgers Environmental Law Center, have actively participated in area transportation planning. They began pushing for technical upgrading of transportation modeling during the interim conformity period, and sought public access to conformity consultations. In Atlanta, the Georgia Conservancy, Citizens for Transportation Alternatives, and EDF have been active participants in the conformity-related debate about transportation priorities, particularly during controversy about the area's proposed interim TIP in late 1997 and early 1998. In New York, a key national-level Environmental Defense Fund operative has been an active technical participant in NYMTC's efforts to develop transportation modeling capacity to comply with the conformity regulations.

These examples indicate that environmental stakeholders have used the conformity process to influence transportation planning

practices and participate in public debate about transportation investments and policies. But not every study site has advocacy groups capable of effective participation. To track conformity well is time-intensive and requires significant technical skills. In each of the cases above, advocacy groups have (1) deployed paid, professional staff to work persistently on transportation and conformity issues and (2) have had in-house technical expertise on air quality and transportation modeling or have gained access to such expertise through alliances with national environmental groups or academic specialists. To participate effectively, environmental advocates have had to make efforts that, in many respects, parallel the involvement of personnel from the core public agencies. They study federal regulations and practices; attend numerous MPO committee meetings typically held during regular working hours; scrutinize voluminous planning documents; seek information and maintain contacts with activists in other nonattainment areas; discuss the issues informally with local agency staff members, simultaneously building working relationships; and prepare for and participate in public hearings. In a major metropolitan area, such activities may approximate the time demands of a full-time job. These tasks are also technically demanding. To review conformity practices thoughtfully and make credible critiques where warranted, environmental advocates must have either a working knowledge of transportation and emissions modeling or advisers with these skills. They also need solid working knowledge of the issues, practices, and procedures of both transportation planning and air quality planning and regulation, and must develop an understanding of how these

processes fit together. To the extent that these groups have credibility as litigators and skill in attracting press attention, they also enhance their influence. Environmental advocacy groups have been forceful players in conformity when they have people with the time and technical skills to be productive in these activities.

While advocates in the San Francisco Bay area, Denver, Chicago, New Jersey, Atlanta, and New York have been able to participate actively in conformity, groups in other areas frequently lack sufficient personnel and technical expertise to do so. In these situations, environmental activists typically feel “out-gunned” by staff from the public agencies involved in conformity. In Houston, for example, one or two Sierra Club volunteers joined by a few other activists, each with unrelated full-time jobs and none with professional training in transportation planning, have sought to monitor the full-range of transportation policy issues, including (but not limited to) conformity. Similarly, in Salt Lake City, a small cadre of part-time Sierra Club volunteers has monitored transportation issues, including conformity. In North Carolina, because the Sierra Club’s volunteer transportation activists are located in Raleigh, they have not been able to monitor events in Charlotte closely; however, they have gotten some part-time technical advice from a University of North Carolina graduate student in planning. Lack of resources puts such groups at a considerable disadvantage in the conformity process. They have difficulty staying abreast of planning and policy development because they cannot prepare for or attend all relevant meetings, and they sometimes believe they get insufficient notice or are excluded. Even when they

actively question analyses and policies, they often feel uncertain whether they are reaching the key technical issues of conformity.

Although both adequate staffing and access to technical expertise appear to be necessary conditions for effective participation in conformity, these are not sufficient conditions. In several study sites, strong environmental groups that have focused on transportation issues more generally have strategically chosen not to become actively involved in the conformity process. In Portland, for example, 1000 Friends of Oregon has long had a strong, influential voice in land use, development, and transportation policy making. It has been a major proponent and sponsor of the LUTRAQ project (land use, transportation, air quality), which has studied and advocated new strategies to encourage compact urban development, featuring enhanced transit service to reduce auto dependence without compromising mobility. Although deeply enmeshed in the policy arena, 1000 Friends has chosen not to participate in the conformity process beyond keeping generally informed. This has largely been a choice about how best to use its limited staff resources, made in the context of generally close working relationships with both the MPO and the air agency as well as a belief that the organization can weigh in if a particular issue warrants attention.

In Boston and elsewhere in New England, the Conservation Law Foundation (CLF), a politically astute policy advocate with strong litigation capabilities, has been an energetic force in debates about the environmental impacts of transportation. In the late 1980s, it was the key advocate for a multi-billion

dollar agenda of air quality mitigation measures, mainly transit projects, connected to the huge Central Artery/Tunnel highway project. It was also an active participant in the stakeholder task force formed by the Massachusetts Department of Environmental Protection to develop policies to meet the nonattainment area's CAAA obligations. Early in the implementation of conformity, CLF filed unsuccessful lawsuits in Connecticut and Rhode Island alleging noncompliance with regulatory mandates. It has not litigated in Massachusetts, however, nor has it gotten actively involved in conformity in the Boston area as a participant in ongoing discussions through the transportation planning process. CLF reports that it is devoting less effort in transportation to such activities and more to work with grassroots community groups on specific projects. It has found the air quality focus of conformity insufficiently broad to accommodate CLF's larger agenda of concerns about transportation's impact on urban life. It also has come to regard conformity as a difficult tool to use in influencing transportation choices because conformity analysis occurs at the conclusion of the planning process, when fully formed project proposals are ready for inclusion in plans or TIPs.

In the 1980s, the Tucson-based Arizona Center for Law in the Public Interest (ACLPI), won litigation that compelled EPA to bring transportation policy in Phoenix directly under federal air quality regulation. While continuing actively to monitor and litigate air quality issues in Phoenix, ACLPI has chosen not to get deeply involved in conformity. It has been unwilling to commit staff to participate regularly in planning meetings; feels that its distinctive competence is in law, not

technical transportation analysis; and sees few "litigation hooks" in challenging conformity determinations, given the courts' inclination to give broad deference to agency judgments on technical matters so long as procedural requirements are upheld.

### **Business Associations**

Business groups have been active in conformity in only a few of the 15 study sites. The Greater Atlanta Chamber of Commerce has followed transportation planning issues closely and, recognizing the potential importance of the conformity process for regional development, has argued for policies to restrain growth in automobile use. In other areas, the business community has gotten involved primarily when inability to conform a transportation plan or program has threatened the flow of federal funds to the region. In Denver, for example, business representatives sit on the transportation policy committee of the MPO and the governing board of the regional air agency and thus contributed to debate about Denver's  $PM_{10}$  conformity problems; but Denver's organized business community was not a key participant. At about the same time, however, business people were involved in a task force advising Governor Romer, which helped push the area forward on transit plans. In Charlotte, at the end of the study period, business voices were heard as conformity stalled the transportation planning process. In Houston, the business community, closely engaged by Clean Air Act issues more generally, has kept abreast of conformity issues as well, but they have not gotten deeply involved. Other than these instances, business

groups do not appear to track or participate in *conformity* to a significant degree, although they may be actively involved in transportation policy more generally.

## **The Broader Visibility of Conformity**

The architects of conformity expected that it would improve the planning process both by requiring active dialogue among the agencies and stakeholders and by bringing sharper analytic tools and better information about transportation impacts on air quality to bear on transportation policy making and investment decisions. Some thought, moreover, that conformity could have wider impact by raising the public profile of transportation and air quality issues, educating the public, and increasing the likelihood that senior policy and elected officials would feel compelled to address these issues.

### ***Engaging Policy Makers***

At least up to the conclusion of the study period – January 1998 – conformity has not generally been effective in focusing the attention of high level appointed policy makers and elected officials on the issues of transportation and air quality. The complex and highly technical nature of the conformity process has been a barrier to expanding participation in the planning arena beyond the core group of planning and policy officials who deal with it on a regular basis, except if major difficulties arise in fulfilling the conformity requirements.

**REGIONAL POLICY OFFICIALS.** At the regional level, this is particularly the case in study sites where the MPO is a single-purpose transportation agency. Because the scope of responsibility and expertise of these MPOs is more narrowly based, they are less likely than the multi-purpose regional councils to attract active participation from the region's key elected officials and general managers (although a few such officials who are particularly interested in transportation may serve on the policy boards of these agencies). City and county managers, mayors of major communities, and other senior elected officials tend to allocate more time to regional institutions that have wide-ranging agendas and regularly deal with politically visible issues.

The active involvement of high-level officials in MPO affairs, whether or not they are routinely involved in conformity, seems to make a difference if conformity problems arise. Although it does not guarantee that the problem can be readily solved, key decision makers are more likely to focus on the problem when they are directly connected to the MPO and have at least rough familiarity with the issues (e.g., in Denver and Atlanta) than when these individuals are more distant institutionally and substantively (as in New York City and Charlotte). They can become important participants when solutions must be worked out with other regional and state agencies, as well as with FHWA and EPA. Alternatively, if such officials have not been exposed to conformity through participation in MPO affairs, they are likely to learn about conformity difficulties only after area agencies have gone through lengthy scrutiny of modeling results. The amount of time available

before a lapse occurs has then typically shrunk, and conformity's technical complexity creates a steep learning curve that makes it difficult to appreciate the issues and potential solutions rapidly.

**GOVERNORS.** What applies to local public managers and elected officials is true for state-level officials as well. Conformity normally flies below the radar of governors and state legislatures. The study sites provide few examples of involvement by these elected officials in conformity issues. The typical case is handled routinely, mainly by the MPO, which is not directly under state government supervision.

Even when conformity difficulties arise, governors' offices generally remain at a distance. Generalist gubernatorial staffs expect the agencies concerned to "take care of" such matters; so long as the agencies are doing so, they have little inclination to become involved. If there are conformity disputes between the state agencies, governors do have authority under the 1993 conformity regulations to resolve them. In practice, however, neither the state DOT nor the air agency has motivation to let disputes escalate to the governor's office (although they may let the governor or his staff know that difficulties exist). Senior decision makers on both sides prefer to work out the issues themselves so they do not lose control of the outcome. Moreover, so long as the issues are seen as primarily "technical" – e.g., concerning modeling assumptions/practices or out-year forecasts – governors' offices are unlikely to feel well equipped to resolve them.

If it seems necessary to make significant

"policy" changes in order to conform a plan or TIP – e.g., altering an emissions budget, changing the control measures in a SIP, or making significant changes in a transportation plan – governors' offices are more likely to stay informed about the issue but not necessarily to become directly involved. Governors want to *choose* the situations in which they either take stands on controversial issues or bring their administrations into conflict with federal agencies.

Even when prolonged conformity difficulties have caused a lapse in federal transportation funding, therefore, governor's offices have not necessarily gotten deeply involved in finding solutions. That was true in Colorado, where Governor Romer was not directly involved in Denver's difficulties in 1994-95,<sup>19</sup> and in Georgia, where Governor Miller had not, as of early 1998, played a major role in responding to Atlanta's conformity problems. When Charlotte's conformity difficulties finally threatened a road building project with strong political backing, however, North Carolina Governor Hunt visibly intervened, directing his department heads to become more actively involved in working out a solution. In Maryland, moreover, Governor Glendening vetoed a bill that would have limited I/M and could have caused conformity problems in Baltimore, although conformity was not the sole focus of this decision.

**STATE LEGISLATORS.** This study has revealed only one situation in the 15 research

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<sup>19</sup>Although he did not play a major role in resolving Denver's conformity problems, Governor Romer has been actively involved in broader issues of transportation and air quality policy making in Colorado.

sites in which state legislatures or individual legislators have significantly participated in conformity matters. Indeed, it appears from interviews with state and MPO officials and advocacy group staff members that few legislators have much awareness of conformity (although legislative action on issues like inspection and maintenance in Maryland sometimes had actual or potential consequences for conformity deliberations). The exception to this pattern – controversy in Colorado in 1994-95 over Denver's  $PM_{10}$  emission budget – is a significant one, however. Unable to demonstrate conformity, the Denver MPO proposed – and the regional air agency supported – raising the emission budget for downtown Denver to a level within federal standards but higher than had previously been allowed by the Denver  $PM_{10}$  SIP. This proposal, bitterly contested by environmental advocacy groups and the city governments of Denver and Boulder, was approved by the state air agency for only a three-year period. Proponents feared this would lead to conformity difficulties as soon as it expired, even though it resolved problems in the short run. Therefore, proponents took their case to the Colorado legislature (which had previously created procedures for legislative review of State Implementation Plans), with the effect that the increased emission budget was subject to time limits during the period covered by the SIP.

### **Public Visibility**

Except in the three areas – Atlanta, Charlotte, and Denver – that have experienced protracted difficulties with conformity or lapses in federal funding, conformity has had an ex-

tremely limited public profile in most of the 15 study sites. This limited visibility is problematic to the extent that conformity is intended to serve as a vehicle for educating citizens about the connections and potential policy tradeoffs between transportation and air quality.

**PUBLIC PARTICIPATION.** The core public agencies have had limited success in drawing attention to conformity. To the extent they have tried to do so, they have relied primarily on organizing and formally announcing public meetings, placing notices in their newsletters, and – increasingly – posting notices and technical documents on MPO websites. Consequently, very few unaffiliated citizens have availed themselves of opportunities for involvement, even when MPOs and others have exerted considerable effort to secure participation. In northern New Jersey, for example, NJTPA, urged on by environmentalists, made serious efforts in the early years of conformity to present issues for discussion in public meetings. In the first year, most of the several dozen participants represented local governments or advocacy groups, not the general public; and attendance dwindled in subsequent years. Chicago was the only study area that reported regular high attendance at its forums to elicit public comments on transportation plans and programs. This was accomplished by an intensive outreach campaign by CATS, independently reinforced and extended by advocacy groups.

**MEDIA COVERAGE.** In most of the study sites, there is scant media coverage of the transportation planning process in general and conformity in particular. Unless controversy arises, conformity is an inherently difficult sub-

ject for newspapers, let alone television or radio, to report. Its highly technical nature, revolving around complex regulatory requirements and arcane modeling procedures, diminishes its accessibility to both generalist reporters and the public. Because it abstractly analyzes aggregate regional emissions, conformity usually provides no concrete focus on either an event or specific projects that might command the public's interest and attention. What is problematic for newspapers is more so for the electronic media. Conformity is not a subject that can be conveyed by soundbite journalism.

Denver, however, is an exception to this general pattern. The Denver newspapers and other media have given extensive coverage to transportation and air quality issues, for example the E-470 project and transit planning. Conformity has gotten substantial attention too, primarily but not exclusively during the 1994-95 lapse in federal funding and debate about the PM<sub>10</sub> emissions budget. The newspapers, in particular, not only followed the day-to-day story line but also periodically published long articles that provided contextual background. Several factors seem to account for this comparatively high public profile. First, the transportation-air quality nexus is not a new issue for Denver citizens. Prominent political leaders and organizations have frequently drawn attention to this relationship for more than a decade. Air quality concerns, symbolized by Denver's notorious "brown cloud," have been publicly connected to transportation at least since the Department of Public Health, CDOT, and business groups conducted a Better Air Campaign in the 1980s. There has also been widespread debate about the benefits and threats of the area's rapid population growth, burgeoning physical

development, and increasing traffic congestion. Reporters developed expertise on this set of issues. More recently, a number of elected officials in the Denver area, particularly from Denver and Boulder, have actively sought to stimulate press and public attention to transportation and air quality issues. They spoke out forcefully on the PM<sub>10</sub> emission budget controversy. Similarly, the area's media-savvy environmental groups have effectively sought public attention for these issues through public statements, testimony at public meetings, and informal contacts with the news media. These broader concerns about transportation and air quality helped frame public attention to the area's conformity problems.

The realistic possibility of an interruption of federal transportation funding also heightened media attention in other locations. Even though the newspapers in Atlanta and Charlotte had given less prior media attention to transportation and air quality issues than in Denver, coverage notably increased in each area when the threat of a conformity lapse provided a clearcut news "hook." As the difficulties in these areas stretched out over many months, the newspapers not only gave coverage to immediate incidents but also began to provide more general background on the issues. Reporters sought out comments from government and advocacy group spokespersons, increasing their opportunities to provide facts and interpret the situation. At the end of the study period in January 1998, with the Atlanta and Charlotte conformity lapses in effect, events had not proceeded far enough to make judgments about how much attention the general public would give to conformity – and how this would affect resolution of the issues.



# **CHAPTER 5: CONFORMITY EFFECTS ON TRANSPORTATION AND AIR QUALITY PLANS**

## **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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## CONFORMITY EFFECTS ON TRANSPORTATION AND AIR QUALITY PLANS

The conformity regulations anticipated four strategies by which transportation and air quality plans can be influenced, either early in the planning process to ensure that conformity will be passed or later to correct problems that have occurred. Areas may:

- craft transportation plans/programs to take account of air quality impacts in selecting project locations and alignments and to include projects with air quality benefits,
- adjust transportation plans/programs by changing project design or timing or by removing projects that generate excess emissions,
- alter SIP emission budgets by trading with stationary and/or area sources or by recalculating mobile source budgets with updated assumptions,
- add control measures to the SIP (e.g., TCMs or mobile source technology measures like inspection and maintenance or reformulated gasoline) to free up room in the budget for VMT growth.

This chapter discusses the extent to which study sites have used these options to deal with conformity difficulties, analyzes the barriers to their use, and explores the alternate strategies areas have employed to solve conformity problems.

### Effects of Conformity on Transportation Plans and Programs

Prior to the CAAA of 1990 and ISTEA, state DOTs and MPOs tended to view transportation primarily through the lens of personal mobility and/or area economic development goals. This often resulted in a transportation system that supported the increasing movement of people and goods, while minimizing congestion, through provision of new roads and, to a lesser degree, transit. The CAAA and ISTEA tried to force a sea change in this process by making transportation planners also focus on air quality as a goal. To achieve this goal, while continuing to provide the mobility necessary to maintain economic objectives as well, planners would have to examine alternatives to highway capacity and the use of single-occupant vehicles.

Although clearly transportation planners have become much more aware of and accountable for the impacts of transportation on air quality, it is too early to draw conclusions about the full impact of these laws – and particularly the conformity requirement – on metropolitan transportation systems. As will be described below, conformity has had significant substantive impacts in a few of the 15 study sites, particularly those that are growing rapidly in population and aggregate amounts of personal travel; in others, major changes in transportation plans/programs in response to air quality objectives did not materialize during

the study period.

Firm conclusions about conformity impacts on transportation plans/programs are premature because of the dynamics of transportation planning and project development. The conformity regulations presume that air quality considerations will be taken into account from early project planning through development of an area's overall transportation plan/program. At the final adoption stage, if the conformity tests cannot be passed, the transportation plan/program can be altered to solve the problem by dropping, scaling back, or exploring alternatives to major capacity expansion projects, or by adding air quality beneficial projects.

Because this study covers only the initial four years of implementing the 1993 conformity rule, however, it could not gauge conformity's ultimate impacts. The regulations were not in effect during the *formative* years for many of the projects in transportation plans/programs that were subject to conformity during the study. This formative period preceded enactment of the CAAA in 1990 and ISTEA in 1991, as well as the promulgation of the conformity regulations in 1993. Projects thus in the pipeline for years were not conceived in or evaluated by the processes established through the CAAA and ISTEA. Some of these projects were grandfathered before the 1993 regulations took effect, and others were included in transportation plans/programs during early implementation of the 1993 regulations. In effect, the conformity regulations were applied to the *final* stages of planning. It is not surprising, therefore, that the effects of conformity have been felt more clearly in the planning *process*

discussed in Chapter 4 than in the substance of the plans themselves. Nonetheless, the patterns that can be discerned from the study are worth noting.

### **Effects on Highway Projects**

**Interim Conformity.** During the period in 1991-1993 that the interim conformity guidance was in effect, although there was considerable initial uncertainty about what this unfamiliar procedure entailed and how it had to be documented, most MPOs experienced relatively little difficulty demonstrating conformity against this standard. In many regions, plans and TIPs included traffic flow improvements and other system management measures that promised to reduce congestion, increase speeds, and thus reduce emissions of VOCs and CO.

In some study sites (e.g., New York City, northern New Jersey, Chicago, and Baltimore), as well as in national forums, environmental advocacy groups disputed the validity of these projections, arguing that because transportation demand models lacked feedback loops to show the impacts of highway capacity enhancements on travel behavior, the true emission impacts of these infrastructure investments were not being identified. They also pointed out other flaws in the analytic tools used by most MPOs – e.g., that models lacked sufficient geographic detail to capture the impact of many relatively small projects on regional emissions.<sup>1</sup>

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<sup>1</sup>See Arnold M. Howitt, Joshua P. Anderson, and Alan A. Altshuler, "The New Politics of Clean Air and Transportation" (Cambridge, MA: Kennedy School of Government, Harvard University, November 1994),

At the national level, such critiques helped shape the content of the 1993 conformity regulations. Other than encouraging some MPOs to begin adding to their analytic staffs, however, they had only minor impacts on the areas under study. In Baltimore, for example, consideration of the challenge to MPO modeling practices jointly raised by the Chesapeake Bay Foundation and the Environmental Defense Fund merely temporarily delayed the area's conformity determination.

The only major conformity effect found in the study sites during this period resulted not because area transportation agencies had difficulty satisfying the requirements of the interim conformity guidance, but because they anticipated a more stringent final federal rule. In Denver, environmental advocacy groups strongly criticized a non-federal project proposed by a public toll authority – the E-470 segment of a circumferential roadway. The advocacy groups contended it would open new land to development, creating more PM<sub>10</sub> emissions than planners were forecasting. Other transportation agencies sought assurances that E-470 would not jeopardize the area's ability to demonstrate conformity in the future. Project sponsors eventually agreed to certain specific mitigation measures and created an escrow fund to finance additional mitigation, if that proved necessary.

#### **THE 1993 CONFORMITY REGULATIONS.**

Table 5-1 shows recent population and VMT

growth data for the 15 study sites, dividing them into “high” and “low” growth areas. Conformity's impacts on highway projects have been felt primarily in a number of the high growth areas – Atlanta, Charlotte, Denver, Houston, Salt Lake City – which found passing conformity's emission budget tests most problematic during the study period.

Of the other high growth areas, Phoenix averted conformity difficulties during the study period by aggressively adopting enhanced inspection and maintenance and fuel controls to reduce mobile source pollution but may encounter conformity problems in the future given its growth rate and road building plans. By the end of the study period, Phoenix had been bumped up to higher classifications for ozone, CO, and PM<sub>10</sub>. Portland, which has far less serious ozone nonattainment problems than the other high growth areas, has had the nation's most stringent growth management regulations in place since the early 1970s and, because it has chosen to invest in rail transit, has comparatively modest highway capacity expansion plans.

Except for Portland, the high growth areas in the study tend to have substantial ongoing land development and significantly rising levels of VMT (which has often proved higher than anticipated at the beginning of the study period). As a consequence, they typically have major highway capacity expansion plans. These areas generally have transit systems with much smaller mode shares than the typical low growth area in the study – and their population and economic growth is primarily occurring at the peripheries of the metropolitan area where

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pp. 24-25. Also available under the same title (Washington, DC: US Department of Transportation, FHWA-PD-97-010 and DOT-VNTSC-FHWA-97-5, February 1997), pp. 27-28.

Table 5-1

**POPULATION AND VMT GROWTH RATES,  
BY HIGHER- AND LOWER-GROWTH STUDY SITES**

	<b>Percent Annual Population Growth ('90-'95)</b>	<b>Percent Annual VMT Growth ('90-'95 or '90-'96)</b>	<b>Daily VMT Per Capita ('95 or '96)<sup>b</sup></b>
<b>Higher-Growth Areas</b>			
Atlanta	2.7%	4.4%	34.6
Phoenix	2.7%	2.8%	22.2
Denver	2.4%	4.5%	24.4
Salt Lake City	2.3%	4.3%	25.3
Houston	2.2%	3.2%	25.4
Charlotte	2.1%	4.9%	24.2
Portland	2.1%	1.9%	17.2
<b>Lower-Growth Areas</b>			
San Francisco	0.9%	1.8%	19.6
Chicago	0.8%	2.0%	18.4
Baltimore	0.7%	2.3%	23.0
No. New Jersey	0.5%	0.6% <sup>a</sup>	24.7
Milwaukee	0.5%	1.7%	20.2
Boston	0.3%	1.2%	12.2
New York	0.1%	-0.2% <sup>c</sup>	11.5
Philadelphia	0.0%	1.4%	17.3

<sup>a</sup>1990-1999 rate

<sup>b</sup>1996 per capita rates calculated using 1995 population data.

<sup>c</sup>NYMTC does not regard negative VMT growth in this period as indicative of future trends.

The sources of data for this table are reported in Appendix IV.

providing high quality transit service is problematic. On the air quality side, these areas, with the exception of Houston, have less severe ozone problems than the low growth areas in the study. Thus, because they have earlier attainment deadlines, they must show required reductions, net of VMT growth, more rapidly than the low growth areas.

Prior to promulgation of the 1993 conformity regulations and in the early phases of implementation, the looming possibility of conformity problems encouraged some of these areas to push as many highway projects as possible through the NEPA process to grandfather them. Thus, if and when a lapse occurred, they would be able to continue to build for at least two or three years before feeling the full sting of interrupted highway funding. Salt Lake City adopted this strategy in anticipation of a conformity lapse in 1994. In Charlotte, although no unusual effort was made to grandfather projects, the area was able to continue under a conformity lapse during all of 1997 with only three projects delayed.

When conformity problems did develop, Denver and Salt Lake City, as will be discussed in the air planning section of this chapter, were able to resolve their conformity problems by altering their air plans or emission budgets and therefore did not have to make significant changes in their transportation plans. In Houston, however, conformity problems in 1994 led to reconfiguration of the Grand Parkway, a planned third circumferential expressway, which was scaled back in

lanes and capacity.<sup>2</sup> In Charlotte, planners and policy officials, unable to avert a conformity lapse in early 1997, were struggling to find ways of solving the problem, with no clear path to resolution apparent.

Atlanta has most severely felt the impact of conformity on highway planning. In the early days of conformity implementation, the northern arc of the Outer Loop was stopped from moving into the TIP, and many local observers now doubt it will ever be built. Later, anticipating a conformity lapse at the end of 1997, Atlanta rushed to complete NEPA reviews of more than 100 projects (some of which were major highway expansion projects) so they could be grandfathered. Because FHWA had not completed NEPA review or screened them out as ineligible by the end of 1997, more than 60 projects were not included in the interim transportation improvement program (ITIP) proposed before the lapse. Amidst outcries from environmental groups, EPA raised objections to six of the projects that did get into the proposed ITIP. It argued that, although the projects came from a previously conforming plan, that plan had been based on outdated assumptions. Because these projects had the potential to increase SOV capacity and thus emissions, EPA felt they should not be allowed during the lapse. FHWA disagreed with this position, which set off an interagency dispute that was ultimately resolved in consultation with the White House Council on Environmental Quality. An agreement was brokered among the regional

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<sup>2</sup>At the end of the study period, with its NO<sub>x</sub> waiver expired, Houston was anticipating further conformity problems to develop – with as yet unknown impacts on its transportation plans.

administrators of EPA, FTA and FHWA in which two of the five (including Georgia SR 400) were limited to design and other preparation work until a conforming plan can be developed. Another project was removed from the ITIP by the MPO.

By contrast, implementation of the conformity rule has had far less impact on transportation plans/programs in the older, relatively low growth metropolitan areas in the study – Chicago, New York, Baltimore, Boston, Philadelphia, Milwaukee, northern New Jersey, and San Francisco. So far, these areas have generally not experienced significant difficulty passing conformity emissions tests (with the exception, in some cases, of the build/no build test). Although these areas typically have more serious pollution problems, they generally have mature highway infrastructure networks, well established transit systems, and relatively slow VMT growth. As a result, many projects in their transportation plans/programs have neutral or positive air quality benefits. These include reconstruction and maintenance of the roadway system and most investments in transit. In these areas, projects that expand road capacity are often traffic flow improvements that relieve congestion but do not increase speeds enough to adversely affect NO<sub>x</sub> emissions. Due to slow growth rates, emissions from increased VMT are more than offset by fleet turnover and the technology-based mobile source measures (such as enhanced I/M and RFG) required by the CAAA in serious and severe ozone areas. Thus, conformity has not required major adaptations of transportation plans in these areas because there are few major capacity expansions on the table, the mix of projects already includes many with air quality benefits,

and technology measures are being adopted in the SIP. In the absence of attainment demonstrations for these areas, the emissions budgets that they must meet come from 15% VOC reduction SIPs and subsequent RFP SIPs. Moreover, at the end of the study period, some had not yet determined conformity against 1999 RFP levels. Because a number of these areas have relatively severe pollution problems, some may develop future conformity difficulties as attainment demonstrations are developed – and as the new ozone and particulate standards are implemented.

**INSTITUTIONAL AND POLITICAL FACTORS IN REVISING TRANSPORTATION PLANS AND PROGRAMS.** How Charlotte and Atlanta will resolve their lapse problems is not clear at this writing. While it is possible that major changes will be required in their transportation plans, that outcome is by no means certain. What these situations and other less dramatic cases in the study suggest, however, is how difficult institutionally and politically it is for MPOs and state DOTs to make such changes.

As noted above, the conformity regulations presume that at the final adoption stage, if the conformity tests cannot be passed, the transportation plan/program can be altered to solve the problem by dropping, scaling back, or exploring alternatives to major capacity expansion projects, or by adding air quality beneficial projects. This view oversimplifies the transportation planning process, implying a greater degree of centralized decision making – both temporal and institutional – than actually exists. It does not fully take into

account the way in which policy and political consensus on the projects that comprise transportation plans is built over a long period of time, through negotiation and bargaining among many and diverse interests inside and outside of government.

MPOs are not autonomous, hierarchical, executive-driven entities that crisply make and carry out decisions. They are representative bodies whose voting members (typically elected officials or appointed representatives of local governments) are episodically involved and have primary interests in and loyalties to other institutions and/or the communities they represent. True “regional” interests are few. Even major projects like turnpikes or international airports have differential sub-regional impacts which divide decision makers; and these projects are always competitive with – and frequently subordinate to – more narrowly focused, more geographically-parochial concerns.

Initial backing to place a project in a regional transportation plan usually comes from individual localities or major transportation operating agencies that wish to address a specific local need or problem, frequently economic or land development. In larger metropolitan areas, notably New York and Chicago, there are formal sub-regional processes for developing plans and allocating funds; in a number of other areas (e.g., San Francisco and Atlanta) *de facto* sub-regional processes exist. Broader support is then built at the regional and state levels as projects move through the MPO and DOT selection processes. Along the way, popular support, as well as that of developers and myriad other interests that will benefit from the project amass behind project plans. The full process

typically takes years, sometimes decades for major projects. Additionally, there are often functional or political inter-relationships among projects that make it difficult to alter or delete one without affecting others. Thus, because “project selection” is not the result of a small group of policy makers acting at a single decision point, it cannot be easily modified or reversed. Disaggregating the final package of projects that appear in a regional transportation plan or program is politically complicated and time consuming, as recent experience in Charlotte and Atlanta clearly illustrates.

A number of forces are thus typically at play to keep highway projects from being changed significantly. Political support for highway capacity expansion tends to be high. In many of these areas, suburban interests, which favor projects that expand highway capacity in their areas over transit or other TCMs, have a majority on MPO boards. Second, even if MPO boards are willing to curb highway expansion, they do not have control over land use decisions that sometimes drive transportation decisions. For example, in Atlanta, the MPO could not stop Gwinnett County’s decision to build the Mall of Georgia but does have the responsibility to provide transportation infrastructure to support it.<sup>3</sup> Third, some of these areas have developed modeling results showing that major highway projects reduce emissions because they relieve

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<sup>3</sup>The MPO board could have voted against the Mall of Georgia but realized that the project would go ahead, even without board approval. It therefore decided to support the project on the assumption that the board would then be in a better position to ask for some concessions from the developers.



congestion and offer more direct routes to motorists' destinations. Such results were obtained for the outer loop project in Charlotte in the period prior to that area's conformity lapse. Finally, air agencies, perceiving a significant disparity in political influence with governors and legislatures compared to state transportation agencies, are sometimes hesitant to raise strong objections to specific highway projects.

Given the difficulty of extricating projects from plans, and the length of time that will elapse before projects in the pre-ISTEA pipeline are exhausted, it is not surprising that major changes in the contents of regional transportation plans have been few. The effects of conformity on the contents of transportation plans/programs will not be fully felt until/unless air quality goals are systematically considered early in project planning cycles.

There are some indications that this is starting to occur. In the study sites, it appears that, as a result of conformity, proposals for major highway capacity enhancement, while not precluded, are less likely to move into preliminary planning phases than they might have previously if they seem likely to be "emission budget busters." (Some transportation planners report that new project ideas are subjected to an air quality "laugh test.") Those projects that move into the next stages of transportation planning – e.g., generating major investment studies (MIS) – are likely to get earlier and more intensive scrutiny for air quality effects than an earlier generation of projects would have.

Because major highway projects may

threaten *financial* as well as emissions budgets, moreover, this effect is strongly reinforced by the fiscal constraint requirement of ISTEA. The research reported here cannot pinpoint the cumulative effects of these two provisions of the CAAA/ISTEA planning regime in part because it is difficult to judge what *might* have happened but has *not*. Nor can it separate their respective causal influences on decisions. But a number of people interviewed in the study believe that together the emission tests and fiscal constraint requirement are likely to have a significant long-term impact on the culture and outcomes of metropolitan transportation planning.

### ***Effects on Transit, Other TCMs, and Land Use Planning***

As Chapter 2 noted, a number of conformity stakeholders, particularly environmental advocacy groups, expected that conformity would promote specific elements of their transportation policy agendas. Among the effects they anticipated were increased transit investments to make service more widely available and convenient, more widespread use of transportation demand management measures to encourage individuals to reduce their reliance on single-occupant vehicles, and tighter coordination of land use and transportation planning to promote development patterns that require less travel. Although these results were not specifically prescribed goals of the Clean Air Act's conformity provision, nor of the 1993 regulations, this study has investigated whether conformity has had an impact on transit, other TCMs, and land use planning.

**TRANSIT.** Expectations that conformity would increase investments in transit were primarily rooted in the belief that transit projects would provide significant benefits in the conformity emission analysis. It was also thought that the fiscal constraint requirement would help assure that transit projects that were included in transportation plans would secure sufficient funding to go forward. To gauge the impact of conformity, therefore, the study team sought to discover whether and to what degree forecasted emission benefits have influenced transit planning and decision making.

In the 15 study sites, conformity considerations seem to have reinforced – but not determined – transit policies in two areas; but in others, transit planning has been much less affected by conformity. Contrary to the cited expectations, most rapidly growing metropolitan areas in the study, including those that have experienced conformity difficulties, have not found transit's emission benefits sufficient grounds to encourage major investments. However, although conformity has not provided incentives for expanded transit in most study sites, the areas that already have extensive transit networks have found the emission benefits of continued investment helpful in demonstrating conformity.

Denver and Portland are the two study sites in which conformity has, to some degree, affected transit policy. In Denver, conformity has provided additional incentives for developing light rail transit that was already well along in the planning stages prior to promulgation of the regulations. Since the area's PM<sub>10</sub> problems, localized in the downtown area most efficiently served by transit, could be

partially mitigated by light rail, the area's conformity difficulties reinforced its intent to go ahead with this project. The fiscal constraint requirement, along with prodding by a coalition of environmental advocates, has also kept the financial feasibility of proceeding with transit in the forefront of decision makers' considerations, although at the conclusion of the study period the failure of a transit-finance referendum left doubt about how funds would be found.

In Portland, conformity has meshed with and buttressed the area's pioneering growth management policies, including the use of light rail transit to encourage compact urban development. In the late 1980s and early 1990s, to counter a state DOT proposal for construction of the Western Bypass, a suburban circumferential freeway, environmental and transit advocates sought to make an alternative case for extending the area's nascent light rail network. Led by 1000 Friends of Oregon, they initiated the LUTRAQ project, in close cooperation with key regional, state, and federal agencies. LUTRAQ consultants used modeling techniques similar to those subsequently required by the conformity rule to analyze alternative land use and transportation policies for the Portland metropolitan area. As a result of the LUTRAQ analysis, 1000 Friends proposed that light rail transit, rather than the freeway, be built in Washington County, to anchor moderate-density neighborhood development along the right-of-way. The analysis showed that this development, when supported by transportation demand management measures, could accommodate the area growth expected over 20 years. In 1992, Oregon DOT made the LUTRAQ proposal one of the five alternatives

it included in the Major Investment Study (MIS) undertaken on the bypass. Meanwhile, Metro, the Portland MPO, recommended a LUTRAQ-like development plan in its Region 2040 Growth Concept, an initial update of its regional plan. When the MIS, issued in 1995, showed that the LUTRAQ alternative was equal or superior to the Bypass plan in most dimensions, ODOT decided to proceed with less extensive road improvements rather than the Bypass. The Portland area is proceeding with a Westside light rail project and moving to implement other elements of the LUTRAQ vision.<sup>4</sup> While conformity did not generate the LUTRAQ analysis and the regional decisions that have flowed from it, state and regional officials have used the CAAA planning process, including conformity, to expand and lock in these policies through the regulatory process.

Some environmental advocates expected conformity to increase the attractiveness of transit investments in rapidly growing nonattainment areas with high VMT growth rates, most of which have relatively limited transit service. However, in ozone nonattainment areas like Charlotte, Atlanta, Phoenix, and Houston – which are characterized by quite decentralized urban development patterns – even substantial investments in new transit service would produce small changes in transit's overall mode share and thus make only small impacts on the projected net growth of regional emissions. Even the 20-year time horizon of conformity is too brief a period to plan

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<sup>4</sup>See Keith Bartholomew, "LUTRAQ to Region 2040: From Citizen Alternative to Official Policy," *Progress* (Washington, D.C.: Surface Transportation Policy Project, March 1997).

and institute major investments in transportation facilities and services, let alone to see changes in travel behavior play out. Consequently, planners and policy makers, even in the face of the conformity lapses in Charlotte and Atlanta, have not seen transit investments as a major way of dealing with conformity pressures.<sup>5</sup> Moreover, our interview subjects report, when viewed strictly as a way of improving air quality, transit projects often compare poorly in cost-effectiveness to alternative mobile source control measures – such as enhanced I/M or reformulated gasoline. Transit may make sense for other reasons, but air quality alone is not a sufficient motive for large investments. This effect is intensified by the preference in many areas for light rail over bus service, which makes transit even more expensive relative to the air quality benefits it can deliver. Except in Denver (where the geographically concentrated PM<sub>10</sub> problem creates a special case among the study areas), to the extent that transit is being seriously considered in high growth areas, it is not because emission reduction credits weigh heavily on the decision-making scales. Instead, some in the business community see transit as an economic development stimulus.

The fiscal constraint requirement cuts two ways, moreover. Transit financing difficulties potentially create fiscal constraint obstacles to including major projects in transportation

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<sup>5</sup>In November 1998, however, Charlotte voters did approve a referendum to establish a sales tax increment for transit. During the same election cycle, Georgia gubernatorial candidate Roy Barnes made transit in the Atlanta area a campaign issue. Subsequently elected, he has proposed expanded regional transit service.

plans. Many states have laws that require them to use gas tax revenues only on roads. These areas must then raise money for transit by other means – frequently through sales or other taxes. Transit funding referenda have failed in Denver and Phoenix, and Houston has redirected money from a successful referendum to other municipal purposes. In Maryland the legislature passed a 50% farebox recovery requirement, which has put a damper on provision of any transit services that cannot garner half of their operating expenses from ridership.

While there is scant evidence that conformity has motivated new transit investments, in study areas that have extensive transit networks and ridership (e.g., New York, northern New Jersey, Chicago, Philadelphia, San Francisco, and Boston), there is no question that the transit component of the transportation plan plays a significant role in each area's conformity analysis. These study sites spend substantial portions of their transportation funds on capital maintenance, replacement, and incremental expansion of transit facilities and service. When modeled as part of the regional analysis, such transit projects generally show air quality benefits that partially offset emissions from VMT growth or additional road capacity (or are neutral in air quality effects). In a few cases, moreover, off-model analysis of transit projects (e.g., the purchase of alternative fuel buses in Chicago and replacement buses in Boston) has helped areas pass build/no build tests that might otherwise have proved problematic.

Nonetheless, the individuals interviewed in these study sites did not regard potential emis-

sion impacts on the conformity analysis as a significant influence on decision making either in terms of the transit budget share or the types of projects supported. The direction of influence in such cases is from transit to conformity, not the reverse. Because of strong local political demand for transit, it appears that these areas would have spent their money on transit projects anyway. In some cases, interview subjects did note, transit investments became attractive or jumped higher on area priority lists because they qualified for funding under the Congestion Mitigation and Air Quality (CMAQ) program created by ISTEA to promote compliance with CAAA requirements. But this incentive effect was independent of the conformity requirement and would have operated were the latter not in place. In the Chicago and Boston cases referred to above, for example, area planners performing the conformity analysis simply took advantage of bus purchases that had already been decided.

**TCMs.** While the conformity regulations do not compel areas to include TCMs in their SIPs, conformity does require that TCMs that have been written into SIPs be implemented in a timely fashion; and the regulations protect certain types of TCMs as exempt projects. These provisions, coupled with the expectation that TCMs would show emission benefits, led some to believe that conformity would increase the adoption of TCMs in transportation plans/programs.<sup>6</sup> Conformity, however, does not appear to be having this effect in the study sites. Although many

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<sup>6</sup>The section on “Conformity and Air Quality Planning” later in this chapter includes a discussion of the degree to which TCMs have been included in SIPs.

MPOs in the study have adopted TCMs – including traffic flow improvements, park-and-ride lots, and HOV facilities – in transportation plans/programs, interview subjects do not regard conformity as the main impetus for doing so.

Only two areas reported adopting a TCM specifically for conformity purposes. Boston added a noncontroversial CMAQ project to the TIP to pass the build/no-build tests in 1995. In Baltimore, where a new TCM resolved TIP conformity difficulties triggered in 1995 by the status of the ECO program, the situation was far more complex politically. The 1994 Baltimore transportation plan had assumed implementation of the then mandatory federal ECO program. But Baltimore business interests strongly opposed the ECO mandate out of concern that the program would put their region at a competitive disadvantage with the Washington metropolitan area, which was not subject to ECO. Governor Glendening responded to the political pressure in May 1995 by declaring ECO a voluntary program, notwithstanding the federal mandate; and the legislature cut all Maryland Department of Environment (MDE) funding for the program.<sup>7</sup> When the MPO staff nonetheless plugged ECO into the conformity analysis to offset NO<sub>x</sub> emissions in future horizon years, MDE expressed discomfort that a program for which it had no funding and no implementation plans was used in the analysis; and the Sierra Club Legal Defense Fund (SCLDF) questioned the claim of full emission credit for a voluntary program.

The MPO therefore proposed a regional commuter assistance program (RCAP), to be financed with transportation funds and implemented by the MPO staff in 2005. Because RCAP claimed minimal emission reduction credits and did not rely on MDE for staff or funding, SCLDF and MDE no longer objected to its use in the conformity analysis. The RCAP program, not scheduled for implementation until 2005, has been refined and supplemented in subsequent conformity analyses.

In other areas, the availability of CMAQ funding has probably increased the attractiveness of some TCMs relative to other possible expenditures; and many areas routinely use an off-model analysis of TCMs to pass the build/no-build test. Because most show only modest air quality benefits, however, other factors have driven their inclusion in area plans; they have not been programmed specifically to capture air quality benefits. Indeed, environmental advocacy groups have argued against some of these projects (particularly transportation system management – TSM – projects intended to use existing infrastructure more efficiently), even when MPO modeling shows conformity benefits, on the grounds that by reducing congestion they will ultimately encourage more drivers to use the road. In each of the study sites, restrictive transportation demand management measures that might have large air quality benefits – e.g., various forms of pricing incentives – are regarded as too politically volatile to adopt. Only San Francisco seriously considered – but did not adopt – such policies during the study period.

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<sup>7</sup>It was not until later in 1995 that Congress passed legislation making ECO voluntary.

The adoption of the RCAP program in Baltimore shows that under some circum-

stances the conformity regulations can give both external stakeholders and public agencies policy leverage that they might otherwise lack, but a commitment to initiate a voluntary regional program ten years hence is a quite limited outcome. Conformity incentives, moreover, did not prove strong enough to prevent Maryland's elected officials from defying the federal ECO mandate, even though it was a TCM written into a SIP, which therefore required timely implementation under the conformity regulations.

#### **LAND USE PLANNING AND REGULATION.**

Neither the CAAA nor the conformity rule require that areas consider or adopt land use controls to constrain transportation and thus mobile source emissions. The conformity rule, however, does require the use of a network-based transportation demand model that relates travel demand to land use patterns, as well as demographic and employment trends, transportation infrastructure, system performance, and policies. Some proponents of conformity hoped that modeling the transportation/land use links would also lead to consideration of alternative land use scenarios in the planning process and wider acceptance of land use regulation as a viable policy option for reducing mobile source emissions.

As described in Chapter 4, this requirement spurred transportation modeling enhancements, some of which were targeted specifically at improving MPOs' capacity to forecast the reciprocal impacts of transportation and land use and relate these to air quality. In turn, better information about how land use patterns, transportation facilities and services, and air quality interact over time, has contributed to regional discussion of alter-

native land use scenarios. In Denver, these issues have gotten substantial public attention. Existing public concern about the consequences of growth increased in response to the area's conformity difficulties and the controversy over the PM<sub>10</sub> budget. In 1995, newly re-elected Governor Romer kicked-off a year-long "smart growth" campaign that brought together a large group of business and environmental leaders from around the state. Spurred by this initiative and expanding public interest in regional growth issues, DRCOG unveiled its *Metro Vision 2020* plan, which recommended constraining metropolitan growth within a 700 square mile area, protecting open space, and committing to transportation alternatives that would support these land use policies. Although DRCOG lacks policy tools to enforce the plan on local government land use decision makers, its transportation policies have sought to promote growth along the lines proposed in *Metro Vision 2020*. In some other areas – e.g., Milwaukee and Philadelphia – transportation infrastructure plans are intended to support specific land use and development scenarios.

As the Denver example indicates, however, the impact of conformity on actual land use decision making is limited by the distribution of institutional responsibilities and the politics of land use regulation in the 15 study sites. Except in Portland, authority for land use *regulation* is a prerogative of individual municipal or county governments, not the state and regional institutions that largely control transportation and air quality deci-

sions.<sup>8</sup> In other states, municipal and county governments tend to resist efforts by higher level governments to regulate their land use authority. Although federal transportation planning regulations require local governments to be represented on MPO boards, not all municipalities in an area serve; and in no situation is the full set of municipal land use decision makers for a given locality involved. Consequently, the public entities with land use decision making authority are not systematically involved in conformity. In San Francisco, for example, at the urging of a coalition of environmental advocates, MTC modeled a transit-oriented land use scenario. Although this scenario showed significant air quality benefits, MTC rejected it as a plausible basis for transportation decisions, arguing that neither the probable actions of land use regulators nor market trends for the location of residences and economic activity were actually likely to produce the patterns of land use that the scenario presumed. Even in the sphere of land use *planning*, only some of the MPOs in the study sites – e.g., in Atlanta, Denver, Philadelphia, Salt Lake City, Houston, and Milwaukee – are comprehensive planning agencies whose scope of responsibility includes regional land use planning. In a number of areas, land use planning is the province of other entities that are less centrally involved in conformity than the MPO.

Portland is the single major exception. As related above in discussing the LUTRAQ policies, Metro, which is both the regional land use agency and the MPO, has legally but-

tressed its growth management policies by getting the state air agency to incorporate them into the SIP, which makes them federally enforceable through conformity. By contrast, in most other study sites, land use decisions are only weakly coordinated with transportation planning and air quality regulation; and the government bodies that hold and implement the actual regulatory authority over land use operate quite independently.

## Conformity and Air Quality Planning

In examining the impacts of conformity on transportation plans and policy, this chapter has been focusing primarily on the effects of air quality regulation on transportation. But through conformity, transportation has also had significant effects on air quality planning, an outcome that deserves close attention. As intended, conformity links the sequential development of transportation plans and programs through the years, on the one hand, and the similarly sequential preparation of state implementation plans to fulfill CAAA requirements, on the other. In what ways and how well has it done so? This section examines the degree to which conformity has influenced the first post-1990 air quality plans and subsequent SIP planning efforts.

### 1992 CO and PM<sub>10</sub> SIPs

Several factors were at play during the start-up phase of CAAA/ISTEA implementation that prevented conformity from having a larger influence on the first round of SIP planning. As

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<sup>8</sup>Maryland also has a growth management regulatory system; however, it is much weaker than Oregon's.

discussed in Chapter 4, the timing of the federal conformity regulation's promulgation limited conformity's impact on the initial phase of air quality planning. Transportation and air quality planners were under tremendous pressure juggling the myriad new demands placed on them by the CAAA and ISTEA. Because the conformity regulation was not written until after the submission date for CO and PM<sub>10</sub> SIPs in late 1992, these plans were developed without knowledge of the regulation's final form or clarity about its implications for SIP planning.

### **1993 VOC Reduction SIPs**

Although the subsequent notice of proposed rulemaking for conformity, issued in January 1993 as the Bush administration was leaving office, alerted some ozone nonattainment areas to the importance of conformity at a relatively early stage of developing their 15% VOC reduction SIPs, the final conformity regulation, developed under the new Clinton administration, was not published until November 1993, a few days after the 15% SIPs were due. Some states were closely attuned to the national discussions about how the conformity regulations should be written<sup>9</sup>, while others more passively awaited the final regulations before turning attention to the implications of this new procedure. As a result, the degree to which conformity considerations

did influence planning for the 15% SIPs varied widely.

Even in areas where the importance of the issues was clearly appreciated, the delayed release of the final version of 1993 regulations left working-level transportation and air quality planners with an incomplete picture of the requirements that would be placed on them. In a few areas – including Boston, Houston, and Milwaukee – broad-based stakeholder task forces participated actively in SIP planning. In these areas, because an overall SIP strategy was debated, stakeholders, including transportation agencies and interests, came to understand the tradeoffs inherent in selecting specific control measures. They also began to address what would be necessary to bring the area into attainment. Through this process, the forthcoming regulations were conceptually addressed, even though the final conformity requirements were still uncertain.

In some other areas, even though a comprehensive stakeholders process was not convened, the future implications of air quality regulation for transportation were also clearly addressed. In the San Francisco Bay area, the MPO was responsible for drafting the mobile-source elements of the SIP and was broadly experienced with emissions forecasting issues as a result of the litigation of the late 1980s and early 1990s. In Phoenix, where the MPO was also the lead agency for air planning and the state legislature was proactively involved, mobile source issues figured prominently in policy making. In Oregon, a state-level Governor's Task Force on Motor Vehicle Emissions developed strategies that influenced the Portland SIP.

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<sup>9</sup>The San Francisco and Denver MPOs, for example, followed these discussions closely. In some states in the study – notably Pennsylvania and New York – state air agencies and DOTs were actively involved but took quite different positions in lobbying nationally on how the conformity provision of the CAAA should be operationalized.



In other areas, however, the air agency dealt separately with the stakeholders in each source category and focused primarily on short-term regulatory requirements. In some of these areas – e.g., Atlanta, Baltimore, Chicago, Milwaukee, New York, and Philadelphia – transportation agencies, concerned about future conformity requirements, made efforts to influence mobile source emission budgets. However, lacking both the need to implement measures beyond those federally mandated and a broad stakeholder forum in which difficult decisions could be discussed, the air agencies chose not to broach directly the politically difficult question of how emission budgets would be allocated over time. In several areas (including Baltimore, Chicago and Milwaukee), air planners nonetheless responded to the transportation agencies' concerns. They explicitly chose to accommodate mobile source growth in their 15% SIP budgets by using liberal VMT growth estimates. These created a future mobile source cushion for SIP purposes as well as for conformity.

Of the 15 study areas, decisions made during this period subsequently created conformity problems for both Charlotte and Salt Lake City, moderate ozone nonattainment areas that decided to seek redesignation to attainment rather than write a 15% VOC reduction SIP. Redesignation was attractive because, as attainment areas, they could avoid implementing some SIP measures that were required in moderate nonattainment areas and could escape the disadvantages faced by nonattainment areas when trying to attract new business locations or expansions. To avoid the penalties associated with a finding of failure to

submit the 15% SIP, these areas were under tight time constraints to develop attainment demonstrations and write ten-year maintenance plans. In neither case, however, did transportation and air planners fully probe the inter-relationship of this choice with the emergent conformity regulations.

In Charlotte, transportation planners did too little to explore and call to the attention of air planners the implications of conformity for future transportation policies; and air planners were focused on fulfilling the immediate regulatory requirements for redesignation. As refined transportation demand modeling subsequently showed that VMT growth rates would be significantly higher than anticipated in the maintenance plan, the emission budgets caused the severe conformity difficulties described in Chapter 3.

In Salt Lake City, the MPO realized late in the redesignation process that the maintenance plan mobile source budgets would cause future conformity problems. However, because a CAAA sanctions clock for failure to submit the 15% SIP was about to expire, the MPO supported the maintenance plan and later sought to address the budget problems through a SIP amendment. In both areas, transportation planners eventually came to believe that stationary sources had actively sought a growth cushion in their budgets during bilateral negotiations with the air quality agency. Whether or not the perceptions expressed above are correct, it is clear that transportation planners in these areas were not aware of or engaged enough during the redesignation process to fully understand the future impacts on mobile sources and thus to

make sure that intersectoral tradeoffs were clearly addressed in setting emission budgets.

### ***Effects on Subsequent SIP Planning***

As areas have moved through subsequent rounds of air quality and transportation planning, conformity has had more impact on the setting of mobile source budgets. In most areas, transportation planners have been much more involved with the 9% and attainment year budgets, although in several (e.g., Atlanta, Philadelphia and New York City) transportation planners have not been deeply involved in negotiations until after preliminary budgets have been set and transportation agencies must react through comments. In the face of conformity problems some areas have adjusted or amended mobile source budgets. Other areas have proactively reassessed emission budgets to anticipate and deal with looming conformity problems.

Overall, this activity represents a major change in the practice of transportation and air quality planning. Even where bureaucratic relations have been far from smooth, the previously separate planning and regulatory processes have become far more tightly linked than ever before. Just as air planners have become more significant and involved stakeholders in transportation planning – as described in Chapter 4 – transportation planners have become more active stakeholders in air planning.

Conformity has spurred this process in two main ways: (1) by stimulating greater scrutiny

of and refinements in the current data and forecasting techniques for transportation demand, and (2) by forcing planners and policy makers to identify, confront, and more directly assess the options they have for reducing mobile source and other emissions. In some areas, this has resulted in refinements of mobile source emission budgets to accommodate transportation needs or, less frequently, adoption of additional control measures to mitigate transportation emissions. In other areas, however, transportation interests have *not* secured the SIP changes they have sought to alleviate conformity problems resulting primarily from higher rates of VMT growth than anticipated. Unresolved differences about how to deal with these problems account for the conformity lapses that existed in Charlotte and Atlanta at the conclusion of the study period. Nonetheless, to a far greater degree than in the past, the implications of transportation growth are being carefully considered in air pollution regulation.

**MODELING COMPLICATIONS.** The complexity of the modeling process and the interrelationships between conformity and SIP modeling, however, have frequently made it difficult to get to the heart of these issues about transportation growth. As discussed in Chapter 3, passing the emissions budget tests has been the most difficult conformity hurdle. Although VMT growth rates are fundamental to most budget test problems, some difficulties have been caused or exacerbated by modeling issues. These include the reliance on HPMS data for VMT estimates in SIP budgets and the requirements that areas use the latest planning assumptions and the most recent emissions model for the conformity analysis.

When conformity problems are primarily caused by the disparity in modeling techniques, resolving the problems has frequently proved time-consuming but possible for the agencies concerned. However, when the conformity difficulties reflect underlying problems of substantively meeting Clean Air Act mandates rather than modeling artifacts, the process of clearing away the modeling confusion has tended to delay dealing with the basic issues of air pollution reduction.

In the 1993 conformity rule and guidance on VMT forecasting and tracking, EPA, with FHWA concurrence, specified the use of HPMS data as the preferred method for calculating VMT to establish the emissions levels on which SIP budgets are set. However, the conformity rule also required that areas use network-based transportation demand models to generate the VMT forecasts on which emissions estimates are calculated for the conformity analysis. Thus, in some cases, because different methods may have been used to calculate emissions in the budget and analysis years, conformity problems may not be due to actual changes in emissions. Some areas, including Charlotte in 1994, have dealt with this problem by making adjustments in the conformity analysis. Others (e.g., Boston and New Jersey) have chosen to amend their SIP budgets using VMT forecasts from the travel demand models to avert future conformity problems. Three areas (Baltimore, Phoenix and San Francisco) avoided this problem altogether by using VMT estimates from the travel demand models to set the SIP budgets initially.

In addition, the conformity rule requires that areas use the most recent planning as-

sumptions in their conformity analyses. To comply with this requirement, areas have updated their estimates of population, employment and travel for use in the transportation models, significantly refining the parameters that had been used to develop the budgets and thus sometimes “finding” more emissions than were reflected in the budgets. Likewise, the use of updated versions of the MOBILE model increased the estimates of certain emissions, under the same conditions. Thus, if an area used MOBILE 4 to set its budgets and MOBILE 5 in the conformity analysis, an increase in emissions might be due to the difference in the models.

An example of this occurred in Salt Lake City in 1994 when the area’s first budget test problems occurred, and the area lapsed after failing to pass the NO<sub>x</sub> budget test for PM<sub>10</sub>. Transportation planners eventually convinced EPA that this failure was not due to real emission increases, but was due to changes in the MOBILE model. The PM<sub>10</sub> budgets were established using MOBILE 4, prior to the promulgation of the 1993 conformity regulations, while the conformity analysis later used MOBILE 5, which calculated much higher levels of NO<sub>x</sub> from mobile sources. With permission from EPA, also granted to a few other areas, Salt Lake City has since continued to use MOBILE 4 for NO<sub>x</sub> conformity for PM<sub>10</sub>.

**CHANGING SIPs TO SOLVE CONFORMITY PROBLEMS.** All of the areas that have had serious problems passing the budget tests (Atlanta, Charlotte, Denver, Houston, and Salt Lake City) have responded by attempting to alter the modeling underlying mobile source emission budgets or to enlarge the mobile

source share of the aggregate budget to accommodate high VMT growth rates. At the urging of transportation planners, air planners for Atlanta and Charlotte discussed budget amendments, but chose not to alter them. Air agencies did amend the Denver and Salt Lake City budgets and in Houston made technical corrections to a submitted, but not yet approved, budget to solve conformity problems. (For further discussion of these areas' conformity problems, see Chapter 3.) Proactively, Portland established out-year emission budgets in its 1996 ozone maintenance plan to make future conformity determinations less difficult.

Atlanta's budget problems began to emerge as the area updated its modeling assumptions in 1995. When the area could not pass conformity in 1996, planners considered amending the mobile source budgets using modeled VMT estimates rather than HPMS projections. However, they quickly realized that, due to much higher than anticipated VMT growth, if the budgets were revised, the SIP would no longer demonstrate attainment, as the planned measures could not offset the higher emissions levels. Under these circumstances, the area lapsed and is in the process of re-examining SIP budgets and control measures in the attainment demonstration and developing a long-range transportation plan that can conform.

When Charlotte encountered its first conformity problems in 1994, the area attributed the budget test failure to the differences in the methodologies used in the budgets, based on HPMS VMT projections, and the conformity analysis, based on modeled VMT levels. The

air agency used a reconciliation technique to make the two methodologies more comparable and thus demonstrated conformity. In subsequent years, new modeling revealed higher than predicted VMT growth rates, making it impossible to demonstrate conformity and leading to a conformity lapse. Efforts to resolve the problem have been complicated by differences over modeling. Transportation planners continued to consider changes to the assumptions on which the budget was based as part of an overall strategy to pass conformity. For example, they weighed the possibility of re-examining some of the default inputs in the MOBILE model, believing that the functional class percentages did not accurately represent the area's vehicle fleet. By the end of the study period, it was clear that modeling changes alone would not resolve the conformity problem. It was not clear, however, how the area could or would address the underlying problem.

As described in Chapter 4, Colorado amended Denver's mobile source PM<sub>10</sub> budgets to resolve its 1994 conformity lapse. The result was establishment of out-year budgets that increased regionally over time, while emissions in the core area were mitigated to keep them within allowable limits. In addition, the area is required to use dispersion modeling to ensure that the spatial distribution of the emissions does not cause violations of the standard.

In 1995, Utah amended the Salt Lake City budget in its ozone maintenance plan to ease problems passing the NO<sub>x</sub> budget test for ozone. By adding ten years to the budget, the area was able to demonstrate that, without adding any additional control measures to the

SIP, NO<sub>x</sub> emissions could rise after the first ten years of the maintenance plan without causing a violation of the NAAQS. With the extended, higher budgets, the area could show conformity to the end of the 20-year transportation planning horizon.

In Houston, planners made technical corrections to a submitted (but not yet EPA-approved) budget in 1997 to pass the VOC budget test for ozone. By switching to modeled VMT estimates rather than HPMS VMT and by correcting for an over estimation of VMT on local streets, the area revised the budgets and demonstrated conformity.

In developing its 1996 ozone attainment demonstration/maintenance plan, Oregon took a proactive approach to future Portland conformity determinations by setting emission budgets for ozone precursors for the years beyond the milestone year of the maintenance plan. Quantifying its safety margin between total emissions in the attainment year (1992) and 2006, it gradually allocated part of this safety margin to create somewhat larger mobile source emission budgets for 2010, 2015, and after 2020. This established a budget to accommodate some possible future VMT growth in the area.

As they look ahead to planning for attainment, several other areas expressed the belief that their mobile source budgets will need to be increased. It is unclear, however, how this would occur as overall budgets continue to shrink and areas begin planning for the new NAAQS. A few areas suggested trying to negotiate a shift of emissions from area source budgets to mobile sources, realizing that area

sources have been regulated much less than stationary sources in the past and present a much less cohesive and powerful lobby.

### **Conformity Effects on SIP TCMs**

To ensure that nonattainment areas actually implement TCMs written into SIPs, the conformity regulations require that implementation of SIP TCMs proceed according to the schedule in the SIP. Although the conformity rule does not require areas to put TCMs in the SIP, some environmentalists believed that the protection given SIP TCMs would encourage areas to do so. During the initial round of SIP planning, however, conformity proved to be a *disincentive* for inclusion of TCMs in SIPs. Most areas decided that placing TCMs in the SIP would be too risky because delay of a SIP TCM could cause a conformity lapse, jeopardizing the flow of federal funding for all transportation projects. This feeling was especially intense in areas like Boston and Philadelphia that had experienced problems with TCMs in previous SIPs. Given the risks, the small emission reduction benefits of most TCMs, and the reality that reductions from TCMs were not necessary to meet the SIP emission reduction goals or conformity, five of the study areas chose not to include any TCMs in their 15% SIPs or maintenance plans. Most other areas included only a few TCMs, the majority of which were TSM projects that they regarded as certain to be implemented on schedule.<sup>10</sup>

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<sup>10</sup>As discussed earlier in this chapter, all areas have included some form of TCMs in their transportation plans/programs, even if they have not written them into SIPs.

There were a few exceptions, however. San Francisco was required, as a result of the MTC suit, to include a number of TCMs in its redesignation request. These were carried forward from its 1982 SIP and were augmented with new TCMs in the contingency plan. In Chicago, planners included more than 100 TCMs in the 15% SIP, believing that any TCMs credited in the conformity analysis should be in the SIP; however, these were primarily traffic flow improvement measures that were deemed certain to stay on track for implementation. In New Jersey, the state DOT proposed including 136 TCMs in the 15% SIP, believing that they would help the area reach its air quality goals. Only later did transportation planners realize that by placing TCMs in the SIP, they helped ratchet the budget down, making conformity more difficult. Although NJDOT originally believed it had included only TCMs that were secure, implementation of some was later held up, with the result that the air agency requested that EPA postpone final approval of the TCMs in the SIP. Now neither the state DOT, nor the air quality agency has any desire to place TCMs in future SIPs.

Portland is the only study area that placed TCMs in the SIP specifically to ensure their implementation. Facing regular challenges in the legislature on the state growth management law, the area included its urban growth boundary and related transit measures in the SIP to protect them from possible changes in the political climate.

Several areas expressed the belief that issuance of promised federal guidance on TCM flexibility would make it much easier to place

TCMs in SIPs. Although TCM flexibility was one of the issues raised by stakeholders during deliberations over the amendments to the 1993 conformity rule, EPA determined that a rule change was not necessary to allow areas to substitute a new TCM for one already in an approved SIP. EPA pledged to issue federal guidance on TCM flexibility but had not done so by the end of the study period. Oregon and Texas therefore developed their own state TCM flexibility rules. Air quality planners in Oregon believe that their TCM flexibility provisions were instrumental in gaining the agreements necessary to put TCMs into the SIP. EPA found the Texas rule unapprovable but did approve Oregon's as part of the area's 1996 ozone maintenance plan.

The most dramatic recent effect of conformity on SIP TCMs occurred in Atlanta, which is pursuing a strategy of adding TCMs to the SIP.<sup>11</sup> Also, the air agency planned voluntary ozone action days, both to help demonstrate attainment and to aid conformity. In December 1997, Governor Miller strengthened this measure by signing an executive order that required state employees to reduce single occupant trips by 20% on ozone action days.

### ***Other SIP Impacts***

**ADDITIONAL CONTROL MEASURES.** Although some areas considered the ramifica-

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<sup>11</sup>The November 1995 amendments to the 1993 conformity rule allow SIP TCMs to proceed during a lapse. EPA believes that in the future this provision may offset some of the disincentive that the timely implementation requirement creates for placing TCMs in the SIP.

tions of conformity when choosing SIP measures other than TCMs, few adopted mobile source control measures that were not mandated by the CAAA. In Arizona, however, the state legislature, which was deeply involved in selecting the measures that comprised the Phoenix 15% VOC reduction SIP, wanted to offset emissions growth that would occur as the area continued to build highways. Legislators therefore explicitly chose to implement mobile source technology measures more stringent than federally mandated for moderate ozone areas, such as enhanced inspection and maintenance and more stringent Reid Vapor Pressure standards for fuel.

As implementation of the conformity rule progressed, some study areas considered SIP amendments that would expand or strengthen I/M to ease difficulties passing the conformity tests. In Denver, when the area faced conformity problems in 1996, an agreement was reached through interagency consultation to tighten the I/M cut points to make passing conformity easier. By decreasing the amount of NO<sub>x</sub> emissions cars would be allowed under the I/M program in 2001, budget test problems for 2015 were resolved. Most areas, however, decided against such a strategy, given the high level of controversy encountered in many states over the I/M program. For example, although the Texas legislature had initially delegated authority to the Governor for decisions regarding the I/M program, it subsequently passed a law that enabled the air agency to expand I/M to additional counties only if they requested to be included in the program. Because none volunteered, consideration of expanded I/M in the Houston area came to a halt.

In Baltimore, although conformity did not influence the initial form or extent of the I/M program, it did help to protect I/M from legislative action that would have made the program voluntary. If the program had become voluntary, EPA would have disapproved the area's SIP, and conformity of the transportation plan/TIP would have been frozen. The governor vetoed the voluntary I/M bill after he was made aware of these ramifications.

In Atlanta, where conformity problems are closely linked with difficulties demonstrating attainment, planners proposed adoption in the SIP of a new mobile source control, "Georgia fuel," which by reducing future emissions would contribute to resolving the area's difficulties.

**NO<sub>x</sub> TRADES AND WAIVERS.** Two study areas, Baltimore and Salt Lake City, considered stationary source/mobile source NO<sub>x</sub> trades as a way of dealing with conformity problems; however, neither found it necessary to follow through with their plans. When Salt Lake City faced NO<sub>x</sub> conformity problems in 1994 due to the change from MOBILE 4 to MOBILE 5, the area considered a NO<sub>x</sub> trade. One of the major stationary sources had recently modernized and, as a result, had a permit for unused emissions. It agreed to sell these outside the area to compensate for the higher mobile source NO<sub>x</sub> emissions generated by MOBILE 5 in the conformity analysis. The need for this trade was alleviated when EPA allowed the area to continue using MOBILE 4 for PM<sub>10</sub> NO<sub>x</sub> conformity.

As the Baltimore area faced the aspect of setting its first NO<sub>x</sub> budget in 1996, trans-

portation and air quality planners feared that they would have difficulty passing the NO<sub>x</sub> budget test. The MPO had just completed a new household travel survey, which was expected to show substantial NO<sub>x</sub> increases. The air agency therefore suggested writing a clause in the SIP that would allow it to trade stationary source NO<sub>x</sub> credits if it encountered a minor mobile source shortfall in the conformity analysis. The MPO hesitated to agree to this plan and the issue became moot when the new data showed NO<sub>x</sub> emissions to be substantially lower than previous levels.

Three study areas, Chicago, Houston and Phoenix, requested NO<sub>x</sub> waivers, at least in part to avoid problems with the conformity NO<sub>x</sub> build/no-build tests. Chicago and Phoenix were given waivers because they were able to demonstrate that NO<sub>x</sub> reductions would not

contribute toward their efforts to reach attainment. Houston's NO<sub>x</sub> waiver was temporary, pending the outcome of a study to determine whether the area was NO<sub>x</sub> limited. When the waiver permanently expired at the end of 1997, the area was uncertain how it would pass future NO<sub>x</sub> budget tests.

**MITIGATION MEASURES OUTSIDE OF THE SIP.** Denver adopted air quality measures outside of the SIP to pass conformity, while avoiding the hurdles of an amendment to add measures to the SIP. As a part of its strategy for dealing with its PM<sub>10</sub> problems, Denver's MPO negotiated agreements with municipal governments to implement non-regulatory street sanding and sweeping measures that are credited in the conformity analysis, even though they are not in the SIP.



## **CHAPTER 6: TOWARD A NEW PLANNING “ARENA”**

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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## TOWARD A NEW PLANNING “ARENA”

Among conformity’s purposes was to establish an institutional and procedural framework – a new planning “arena” – within which the set of state and regional agencies and stakeholders concerned with transportation and air quality would organize their many policy interactions. Although securing compliance with Clean Air Act mandates was a presumed minimum requirement, some observers expected that conformity – combined with other innovations prescribed by ISTEA, such as regular updating and fiscal constraint of regional plans – would have more far-reaching impacts. More and better demographic, economic, land use, travel, and air quality data would be gathered and evaluated with sharper analytic tools. Agencies and stakeholders would articulate and openly discuss their goals, propose alternative policies to achieve them, assess feasibility and tradeoffs, and consider whether and how to implement them. The improved planning process, in turn, would inform public discussion of transportation and air quality issues and provide a stronger basis for deliberation by appointed policy makers and elected officials.

Given the historic separation of these domains, this was an ambitious set of expectations. In conclusion, therefore, it is well worth focusing on whether and how much conformity has contributed to creating such a planning arena in the 15 study sites and what limitations exist.

### Better Data and Analytic Tools

The interviews conducted for this study reveal a broad professional consensus that, at least in the study sites, conformity-related improvements in planning methods are genuine and valuable not only for air quality regulation but also for other planning purposes.

A few individuals pointed to the opportunity costs of conformity-induced modeling enhancements, arguing that they come at the expense of other potential changes in analytic practice, especially more extensive analysis of alternative planning scenarios. This outcome results not so much because these practices are mutually incompatible but because limited time and resources make it difficult or impossible to do both.

But most individuals interviewed for the study believe that the conformity requirement that transportation planners use advanced analytic tools and the latest available planning assumptions to forecast transportation demand and mobile source emissions – coupled with the infusion of ISTEA funds to hire technical staff and collect more recent, often more detailed, data about demographic trends, land use, and travel behavior – has led to significant improvements in planning capabilities in all of the study sites, though in varying degrees. Moreover, one might expect these changes to have increased impact as they are used and refined in successive planning cycles.

Although enhanced modeling and planning methods might eventually have been adopted as a result of ISTEA planning requirements alone, most transportation planners interviewed for the study believe that conformity pushed technical planning changes significantly faster than would otherwise have happened. A number of environmentalists, however, expressed impatience with the scope and pace of these changes, arguing that MPOs often took too long to implement changes and have not gone far enough in adopting new methods. Transportation planners asserted, in turn, that the advocates underestimated the difficulty of instituting change, especially in the context of the sweeping scope of new ISTEA planning requirements.

While the balance between these views is arguable in any particular situation, it seems more striking that across the study sites the direction of change is consistent, even if the results are not equal in all cases. Interviews for this study strongly suggest that the culture of transportation planning, which at the working level had previously given little attention to air quality, has been significantly affected. Improvements in transportation modeling and the principle that air quality impacts should be taken into account by transportation planners are widely accepted by transportation planners.

Improvements in transportation planning have served not only to focus transportation planners on the goals and requirements of the Clean Air Act but also have had a direct effect on air quality planning. Improved forecasts of VMT, the finer detail achieved through technical enhancements, and the increased frequency of the regional analysis provide air planners with a better understanding of the

geographic distribution of transportation impacts and changes over time. New planning tools have thus been deployed to achieve far greater integration of transportation and air quality analysis than previously existed. In several areas, air quality planners have capitalized on the modeling improvements by incorporating VMT estimates from the travel demand models into the budget setting process. Most agree that using the same VMT growth assumptions in the budgets and the analysis of transportation plans/programs better integrates transportation and air quality planning and creates a more valid comparison for conformity. Use of the improved models and data also enhances the air quality planning process by giving air planners information helpful in selecting appropriate and sufficient SIP measures.

## **Analysis and the Regulatory Process**

It is important to distinguish, however, between acceptance of air quality analysis for *planning* purposes as opposed to *regulatory* purposes. Conformity shapes policy decisions that affect air pollution, mobility, economic development, and quality of life in the metropolitan areas in this study. Large sums of federal aid – as well as legal authority to proceed with projects using that money – are also at stake in the process. As a result, many transportation and air planners continue to have significant differences about how the conformity analysis is conducted and what impacts it has on the quality of decision making.

While most transportation planners in MPOs and state DOTs regard the results as valuable for thinking about transportation and air quality “futures” and the possible effects of alternative policies, some resent the absolute priority that air quality goals have over all other goals in transportation planning. Many, moreover, question the validity of using the model outputs for making conformity determinations, arguing that conformity conveys an alarmingly false image of precision. These planners point to baseline estimates that at best approximate actual conditions, the plausible range of assumptions about future rates of change in key variables, the known imperfections of even state-of-the-art transportation demand models, the acknowledged shortcomings of the emission models, and the incompatibility of model structures that makes it analytically problematic to use the output of the demand models as input for the emission models. Many transportation planners therefore express deep skepticism about using current modeling techniques, which taken together have a wide band of possible error, to make long-range forecasts of future pollution – especially when these results are used for a threshold regulatory test in conformity potentially affecting the flow of large amounts of federal funds for their plans and projects.

These feelings are sometimes intensified because of inconsistencies between the planning assumptions incorporated in SIPs and those in the conformity analysis. Not all areas have used the outputs of travel demand models for estimating transportation emissions in their SIP development process, particularly during the initial years after the CAAA of 1990 was enacted. Moreover, because the conformity

regulations require transportation planners to use the latest planning data and assumptions available, the data and assumptions used for conformity may differ significantly from those used – perhaps a few years earlier – in developing a pertinent SIP.

Inconsistencies between the data and planning assumptions in a SIP and a later conformity analysis do not always make it more difficult to demonstrate conformity. Indeed, sometimes the assumptions embedded in SIPs make it easier to conform a transportation plan than would be the case if the SIP were updated. But if the reverse is true, transportation planners often express frustration that the complexities and slowness of the state regulatory and federal approval processes make it quite time consuming – and often impractical within the time frame of regular transportation planning cycles – to update SIP planning assumptions.

By contrast, many air planners and environmental advocates, while acknowledging some shortcomings, contend that the modeling results used in conformity analysis provide a sufficiently good approximation of current reality and future development patterns to warrant their use for conformity, especially given their view that it is critically important to achieve Clean Air Act goals. Others argue that emission models underestimate mobile source pollution, so that transportation projects get the benefit of the doubt. Some suspect that MPOs shade the transportation demand analysis to produce favorable results.

Another divergence in the perspectives of transportation and air planners on the regulatory process deserves mention. Conformity permits the modeling to take “credit” for improvements in vehicle emission control systems or beneficial changes in fuel composition only when these are mandated by federal regulations and/or adopted in legally enforceable regulations by the state.

Many transportation planners and advocates regard this as an artificial feature of the planning system. They contend that it is poor policy to be forced to forgo what they regard as transportation improvements which would otherwise be permissible simply because the time frame of decision making on national technology policies is independent of – and therefore imperfectly synchronized with – the timing of their conformity decisions.

For example, a nonattainment area may be experiencing serious conformity problems while, simultaneously, significant changes in national regulation of automobile emission control systems and fuels may be under debate and likely to have major impacts on mobile-source emissions during the time frame of the conformity analysis. For example, while Charlotte has been experiencing a conformity lapse, there has been intense national discussion of the Tier II controls, possible extension of controls to new vehicle types (e.g., to sports utility vehicles), and possible changes in the sulfur content of gasoline.<sup>1</sup>

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<sup>1</sup>It should be noted, however, that these controls would not affect Atlanta’s conformity problems, which arise from an inability to demonstrate conformity in 1999, its ozone attainment year.

Many air agencies and environmental advocates argue that until such controls are legally mandated, it is inappropriate for conformity to recognize still-speculative emission reductions. Once transportation projects are approved, they are difficult or impossible to reverse if emission reductions from technology measures do not materialize.

## **Confronting Conformity Difficulties**

In the framework of the CAAA of 1990, conformity is an analytic “trip-wire” to alert policy makers to inconsistencies between two sets of policies – air quality planning (codified in state implementation plans) and transportation planning (codified in transportation plans and programs). Indeed, in many instances, conformity results in serious reconsideration of evolving mobile-source emission issues more quickly than would occur through periodic SIP revisions alone.

In the 15 study sites, this reconsideration tends to occur in distinct phases. First, planners carefully re-examine the modeling on which the conformity analysis is based to confirm that a problem exists and to discover its magnitude. When conformity difficulties are significant, they must then deal with the institutional and political dynamics of changing either the transportation plan/program or the applicable SIP so that conformity can be demonstrated.

### ***Re-examining the Models***

When an MPO encounters difficulties in showing that its transportation plan or program satisfies the requirements of conformity, the most common initial response, as Chapters 3 and 4 have shown, is exhaustive re-examination of modeling data, methods, and results.

Through the process of reconsidering planning assumptions and modeling techniques, the transportation agencies seek to reduce the possibility that conformity penalties might result from “technical” difficulties in the modeling rather than “real” future problems revealed by conformity forecasting of emissions. Environmental agencies, in turn, seek to discover whether the analysis has been conducted appropriately and whether genuine conformity problems exist. As a result of such scrutiny on both sides, errors have been discovered, improved estimates of key parameters have been secured, and refinements of modeling methods have been introduced.

The character of consultation and stakeholder participation appears to have important consequences for the credibility and longer term effects of the analytic process.

In areas with less intense interagency consultation practices, reassessment of modeling methods is likely to be performed primarily by MPO staff, sometimes with little visibility to other agencies and stakeholders. In a number of these cases, as described in Chapter 4, air agencies and environmental advocacy groups lack sufficient staff resources or technical skills to participate actively and effectively scrutinize

the MPO’s work. But MPO autonomy comes at a cost: reduced confidence by outsiders in the results. The opacity of the process tends to increase suspicions that the MPO’s interest in “passing” the conformity tests has colored its analysis.

By contrast, when the analytic issues of conformity have been the focus of careful “up-front” discussion and debate among interested agencies and stakeholders, either early in the planning cycle or in previous cycles, reconsideration is more likely to be an open process. While sometimes contentious and not always fully eliminating doubts on either side, these efforts have nonetheless tended to strengthen confidence in the results. Transportation planners are more likely to regard any remaining problems in demonstrating conformity as “real” rather than modeling artifacts; and air planners and advocacy groups are less likely to harbor suspicions that conformity has been demonstrated by technical manipulation.

As successive cycles of conformity analysis are undertaken, effective interagency consultation creates greater mutual confidence in the analytic process. In turn, this allows both sets of planners and other stakeholders to focus more clearly on substantive issues and policy choices rather than on disputes about modeling.

### ***Generating Policy Debate***

Conformity was also clearly intended to get policy officials, elected executives, legislators, and a broad array of stakeholder groups to confront the *policy* dimensions and

tradeoffs of transportation and air quality. Nonetheless, data from the 15 study sites suggests that it can sometimes be problematic to move discussion of conformity problems beyond the relatively small circle of transportation and air quality professionals and the few stakeholder representatives who deal with it on a regular basis. In some of the study areas, this has led to considerable delay in confronting the roots of their conformity problems.

As discussed in Chapter 4, the complexity of conformity modeling and analysis can be a barrier for less technically sophisticated participants. This has been a problem in areas like Charlotte and Atlanta, where, encountering severe conformity problems, the transportation and air quality professionals have spent a year or more probing the models and analysis, looking for technical fixes to the problem, but only slowly getting high-level officials and the public to address the underlying issues. Thus, the expectation of conformity architects that public debate would be spurred by conformity problems has been partially frustrated by the technical nature of conformity discussions.

It is not the case that public discussion is suppressed. Denver's experience with  $PM_{10}$  conformity difficulties demonstrates that vigorous policy debate can develop as an area wrestles with its conformity problems. Similar public debates have emerged in Atlanta and Charlotte during 1998 (a period outside the time frame of this study). In these instances, the causes, consequences, and possible solutions of the area's air quality and transportation difficulties have gotten a good deal of

public attention, including from key elected leaders.

Nonetheless, there seems to be a substantial lag period as conformity difficulties move from a primarily bureaucratic setting that involves a small number of technical personnel from public agencies (and perhaps similar people from a few private groups) to a more visible, public policy process that addresses the underlying issues and debates options and tradeoffs.

### ***The Institutional Dynamics of Changing Transportation and Air Quality Plans***

In the event of conflict between transportation plans and air quality commitments, the conformity regulations permit an MPO or state, in principle, to resolve the inconsistency by making changes to its transportation plans/programs, its SIPs, or both. To resolve a conformity problem, an area might choose to make changes in transportation plans/programs (e.g., by dropping, scaling back, or exploring alternatives to major highway capacity expansion projects, or by adding air quality beneficial projects). Alternatively, policy makers might decide in a given case that it made sense to add new mobile source control measures to the SIP (e.g., fuel requirements or a strengthened inspection and maintenance system) or to make tradeoffs between mobile and other sources.

Giving nonattainment areas flexibility in deciding how to meet national pollution standards was a key element of the underlying philosophy of the 1990 Clean Air Act Amendments. As a practical matter, however, it has

often proven more difficult to make such changes than some of the architects of conformity anticipated.

Many environmental advocates and air planners have been frustrated that the transportation planning/programming process has proven less pliable than they hoped or expected. MPOs are not autonomous, hierarchical, executive-driven decision-making bodies; and project selection is not the result of a small group of policy makers acting at a single decision point. Instead, MPOs build policy and political consensus on the projects that comprise transportation plans through bargaining and negotiation, over extended periods of time, among diverse interests inside and outside of government. To disaggregate the final package of projects that appear in a regional transportation plan or program is therefore politically arduous and time consuming.

This problem is exacerbated by the weak link between transportation planning and land use regulation that exists in virtually all of the study sites. Although conformity must take account of the likely outcomes of land use regulation, the core regional and state agencies responsible for conformity – the MPO, the air agency and the state DOT – generally have no direct authority over land use decision making and regulation. So development projects independently initiated by local governments or private developers may create pressures for transportation improvements that have the potential to cause conformity difficulties.

Even where MPOs have land use *planning* responsibilities, which not all of them do have,

they do not have land use *regulatory* authority – with the exception among the study sites of Portland’s Metro. Local and county governments typically wield this power – and these entities are not direct participants in conformity except through their representation on the MPO board.

From the transportation side, therefore, it frequently seems attractive to resolve conformity difficulties by seeking changes on the air quality side – i.e., in the state implementation plan. But this path encounters other kinds of difficulties.

Although legally required practices vary, in many states revising a SIP may necessitate not only a process of drafting and internal agency clearance by legal counsel and policy officials but also public hearings and adoption by some form of environmental regulatory board. Depending on the state, this may take many months, sometimes more than a year. During the study period, moreover, SIP amendments also had to be reviewed and approved by EPA before they could be used in conformity determinations. This frequently took longer than a year. The August 1997 conformity amendments are intended to reduce this aspect of the problem by permitting nonattainment areas to use a newly *submitted* emission budget after 45 days instead of waiting for formal EPA approval of the budget.

This time frame for SIP revision is rarely compatible with the rhythms of the transportation planning process, which is often connected to an annual cycle of project programming and the triennial long-range planning process required by ISTEA. To go through the



SIP revision process is almost always to delay the normal schedule for developing and initiating new plans/programs.

Seeking changes in a SIP is also burdensome for air planners. They often have competing priorities for time and resources, including meeting *new* SIP development responsibilities. Not unlike the political process that produces transportation plans, emission budgets usually represent consensus policies established after long periods of negotiation among stakeholders from different emission-source sectors. Reopening budget allocation decisions can ignite politically potent intersectoral disputes. Air planners are therefore often reluctant to manage SIP revisions. Given these facts, it is not surprising as Chapter 5 reported, that making SIP changes was not a common approach to solving conformity problems in the 15 study sites.

While changing plans is difficult on both sides, it is ultimately transportation plans that are placed at risk by conformity difficulties. This was clearly intended by the legislative architects of the conformity provision of the CAAA of 1990. Federal transportation funding is a large, politically significant sum in most states. A threat to its use is a way of getting attention from policy makers and many stakeholder groups that a problem exists in transportation and air quality plans. Whether or not the solution lies on the transportation side – and what that solution ought to be – may be less important than getting decision makers and constituencies focused on the air quality problem and searching for a solution.

But it is also true that the officials with direct responsibilities for the program at risk – in MPOs and state DOTs – have direct influence over only *some* of the potential ways of

resolving inconsistencies between transportation and air quality plans. Air planners have far less incentive to consider SIP changes. To the extent, therefore, that conformity is meant to allow even-handed consideration of the *means* of resolving inconsistencies between transportation and air quality plans, the difficulties in changing SIPs and the disparities in the timing of the two planning processes is problematic. It will be instructive to see whether the August 1997 conformity amendments make a material difference in the way nonattainment area policy makers seek to resolve conformity difficulties.

## Conformity as an Evolving Process

This study is a snapshot of conformity during a particular period, but like any regulatory process conformity is evolving and responding to new situations. In addition to the issues noted in this chapter, conformity must adapt to the new National Ambient Air Quality Standards for ozone and particulate matter, which will make new areas subject to regulation. New tools for analyzing transportation demand and the effects of transportation policies on pollution are in development. The impact of conformity over the long run on transportation planning/programming may be greater than it has been to date – as new plans and projects take account of conformity in their formative stages, not just as they are being finalized.

EPA and FHWA, the sponsors of this study, are planning a second phase to follow these developments, which will certainly warrant analysis to measure progress and identify problems.

# ***APPENDIX I: GLOSSARY OF ABBREVIATIONS***

## **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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*Appendix I*

## **GLOSSARY OF ABBREVIATIONS**

### **TERMS:**

CMAQ	Congestion mitigation and air quality
CO	Carbon monoxide
ECO	Employee Commute Options
EMFAC	California motor vehicle emissions model
HOV	High occupancy vehicle
HPMS	Highway Performance Monitoring System
I/M	Inspection and maintenance
ISTEA	Intermodal Surface Transportation Efficiency Act
LEV	Low emission vehicle
LUTRAQ	<b>L</b> and Use, <b>T</b> Ransportation, and <b>A</b> ir <b>Q</b> uality study conducted in Portland
MIS	Major investment study
MOBILE	EPA motor vehicle emissions model
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO <sub>x</sub>	Nitrogen oxides
NPRM	Notice of proposed rulemaking
PM <sub>10</sub>	Particulate matter smaller than or equal to 10 micrometers
RCAP	Regional commuter assistance program
RFG	Reformulated gasoline
RFP	Reasonable further progress
ROP	Rate of progress
RTP	Regional transportation plan
RVP	Reid vapor pressure
SIP	State implementation plan
SOV	Single occupancy vehicle
STIP	State transportation improvement program
TCM	Transportation control measures
TDM	Transportation demand management
TIP	Transportation improvement program
TSM	Transportation systems management
UAM	Urban airshed model
VMT	Vehicle miles traveled
VOCs	Volatile organic compounds

### **AGENCIES:**

ABAG	Association of Bay Area Governments (San Francisco area)
ARC	Atlanta Regional Commission
BMC	Baltimore Metropolitan Council
Caltrans	California Department of Transportation
CATS	Chicago Area Transportation Study

CDPHE	Department of Public Health and Environment (Colorado)
CTPS	Central Transportation Planning Staff (Boston MPO staff)
DEC/EnCon	Department of Environmental Conservation (New York State)
DENR	Department of Environment and Natural Resources (North Carolina)
DEP	Department of Environmental Protection
DNR	Department of Natural Resources
DRCOG	Denver Regional Council of Governments
DVRPC	Delaware Valley Regional Planning Commission (Philadelphia area)
EDF	Environmental Defense Fund
EOTC	Executive Office of Transportation and Construction (Massachusetts)
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GDOT	Georgia Department of Transportation
H-GAC	Houston-Galveston Area Council
IDOT	Illinois Department of Transportation
MARTA	Metropolitan Atlanta Rapid Transit Authority
Metro	Metropolitan Service District (Portland area)
MDE	Maryland Department of Environment
MDOT	Maryland Department of Transportation
MTC	Metropolitan Transportation Commission (San Francisco area)
NJDEP	New Jersey Department of Environmental Protection
NJTPA	New Jersey Transportation Planning Authority
NYMTC	New York Metropolitan Transportation Council
OTAG	Ozone Transport Assessment Group
PennDOT	Pennsylvania Department of Transportation
SEWRPC	Southeastern Wisconsin Regional Planning Commission
TxDOT	Texas Department of Transportation
TNRCC	Texas Natural Resources Conservation Commission
USDOT	US Department of Transportation
USEPA	US Environmental Protection Agency
WFRC	Wasatch Front Regional Council (Salt Lake City area)
WisDOT	Wisconsin Department of Transportation

## **APPENDIX II: CONFORMITY PROFILES OF 15 STUDY SITES**

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

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Appendix II

## CONFORMITY PROFILES OF 15 STUDY SITES

### ATLANTA

**Pollutant(s):** Ozone  
**1990 Classification:** Serious

**Geographic Boundaries of Ozone Nonattainment Area:**

**13 Counties:** Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding and Rockdale.

**Geographic Boundaries of MPO Area:**

**10 Counties:** Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,989,341				
1990	2,653,159	81,472,984	2.9% <sup>b</sup>		30.7
1995	3,038,050	105,218,456 <sup>a</sup>	2.8% <sup>c</sup>	4.4% <sup>d</sup>	34.6 <sup>e</sup>

<sup>a</sup>1996      <sup>c</sup>1990-1995      <sup>e</sup> Per capita rates are calculated using 1995 population and 1996 VMT.  
<sup>b</sup>1980-1990      <sup>d</sup>1990-1996

**Key Institutions:**

**MPO:** Atlanta Regional Commission (ARC)  
**State Transportation Agency:** Georgia Department of Transportation (GDOT)  
**State Air Agency:** Georgia Department of Natural Resources (DNR)

**Summary of Conformity Issues:**

**1995** – ARC began implementing model and data upgrades that captured higher emission levels than had been reflected in earlier analyses. As a result, Atlanta barely passed the NO<sub>x</sub> budget test.

**1996** – Passing the budget test proved even more problematic than it had in 1995. Because the area was experiencing higher than expected VMT growth and was slow to implement inspection and maintenance and reformulated gasoline programs, its 1999 NO<sub>x</sub> budget for ozone set an emissions cap that the area could not meet in developing a new TIP. ARC, the Atlanta MPO, and Georgia DOT struggled to develop strategies that would close the large gap between allowable and projected emissions. Ultimately, the northern arc of the Outer Loop was barred from moving into the TIP, the road to the massive new Mall of Georgia was scaled back, and only exempt and grandfathered projects from the previously conformed 1995 TIP were allowed to move forward.

**1997**- Difficulties continued throughout 1997 during which ARC could not develop a new long-range plan that conformed. In August 1997, FHWA granted a six-month TIP extension, during which a controversy over grandfathering projects surfaced. Not able to develop a full conforming TIP, the MPO drafted an *interim* TIP (ITIP) that contained only TCMs written into SIPs that had received EPA approval, as well as grandfathered

and exempt projects from the 1995 regional transportation plan update. Several dozen projects that ARC originally wanted to regard as grandfathered were not ultimately included in the ITIP because FHWA felt they could not meet the applicable NEPA requirements; EPA simultaneously reviewed the NEPA documents. FHWA's regional office was then prepared to approve the ITIP, but EPA's regional office raised concerns about several of the remaining grandfathered projects in the ITIP.

This led to sharp policy disagreements among the federal agencies. Even though the 1995 plan had received a conformity determination, EPA's regional office argued that the conformity analysis had not satisfied all of the applicable requirements of the conformity rule. EPA therefore believed that the disputed projects should not be grandfathered because they would ultimately substantially increase highway capacity, worsening air quality problems. Staff from the White House Council on Environmental Quality ultimately brokered a regional-level agreement among EPA, FHWA, and FTA that allowed five of six disputed projects to move forward in the ITIP, with two of these limited to planning and design. ARC removed the sixth project from the ITIP. The EPA-FHWA-FTA agreement also established dates by which the Atlanta area should complete a conforming long-range plan and an ozone attainment demonstration.<sup>1</sup> Conformity lapsed in Atlanta on January 17, 1998.

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<sup>1</sup>In addition, it recognized the need for national-level staff of EPA, FHWA, and FTA to develop a national memorandum of understanding or make changes in the conformity regulations to ensure proper use of the grandfathering provision, particularly to see that it was not used to evade the consequences of a conformity lapse.

## BALTIMORE

**Pollutant(s):** Ozone  
Carbon Monoxide

**1990 Classification:** Severe 1  
Moderate 2 (Redesignated to Attainment 1995)

### Geographic Boundaries of Ozone Nonattainment Area:

**6 Counties:** Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, and Howard.

### Geographic Boundaries of MPO Area:

**6 Counties:** Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, and Howard.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	2,173,989				
1990	2,348,219	49,900,000	0.8% <sup>a</sup>		21.3
1995	2,432,993	55,900,000	0.7% <sup>b</sup>	2.3% <sup>b</sup>	23.0

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

### Institutions:

**MPO:** Baltimore Metropolitan Council (BMC)

**State Transportation Agency:** Maryland Department of Transportation (MDOT)

**State Air Agency:** Maryland Department of the Environment (MDE)

### Summary of Conformity Issues:

**1993** – During Interim Conformity, the Chesapeake Bay Foundation and the Environmental Defense Fund jointly challenged the MPO's modeling practices. This temporarily delayed the area's conformity determination.

**1995** – The Sierra Club Legal Defense Fund questioned the MPO's use of emission reductions from the ECO program to pass the build/no-build test because ECO had been made voluntary and its funding had been cut by the legislature. The MPO therefore dropped ECO from the conformity analysis and substituted a regional commuter assistance program that it developed and pledged to fund and implement in 2005.

**1996** – The Sierra Club Legal Defense Fund again raised issues with the conformity determination, questioning whether Baltimore could claim full emission reduction credit for the enhanced I/M program, which had not yet been implemented. EPA, however, advised that the conformity analysis should be calculated assuming implementation of the measures in the *submitted* SIP, whether or not they were moving forward on time.

**1997** – The Maryland legislature passed a bill to make the I/M program voluntary. The Governor vetoed this bill at least in part because of the conformity implications of failing to implement the required form of I/M. If the program had become voluntary, EPA would have disapproved the SIP and conformity of the transportation plan/TIP would have been frozen.



## BOSTON

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Serious
Carbon Monoxide	Moderate 2 (Redesignated to Attainment 1996)

### Geographic Boundaries of Ozone Nonattainment Area:

**9 Counties:** Barnstable, Bristol, Dukes, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester. (But study focused only on geographic area congruent with that of the Boston MPO.)

### Geographic Boundaries of MPO Area:

The Boston MPO covers 101 towns and cities within the larger ozone nonattainment area.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	4,945,835				
1990	5,204,103	59,816,200	0.5% <sup>b</sup>		11.5
1995	5,274,317	64,412,700 <sup>a</sup>	0.4% <sup>c</sup>	1.2% <sup>d</sup>	12.2 <sup>e</sup>

<sup>a</sup>1996      <sup>c</sup>1990-1995      <sup>e</sup>Per capita rates are calculated using 1995 population and 1996 VMT.

<sup>b</sup>1980-1990    <sup>d</sup>1990-1996

### Institutions:

**MPO:** Boston MPO, staffed by the Central Transportation Planning Staff (CTPS)

**State Transportation Agency:** The Executive Office of Transportation and Construction (EOTC)

**State Air Agency:** Massachusetts Department of Environmental Protection (DEP)

### Summary of Conformity Issues:

**1994** – Boston could not pass the build/no-build tests for CO, NO<sub>x</sub> and VOCs, due to an error in a spreadsheet supplied to CTPS by DEP for the conformity analysis. The conformity determination was delayed for about two months while the agencies discovered and corrected the problem.

Conformity was also held up in 1994 over fiscal constraint issues. During the approval process for the FY 1995-97 STIP, FHWA's Massachusetts division office cited two fiscal constraint problems. First, FHWA believed that the second year of the STIP (FY 1996) was 100% over-programmed because the state had budgeted the sum of its highway apportionments, plus its unobligated balance. Second, the state was counting on money from a bond bill not yet approved by the legislature to fund a major project during the first two years of the STIP. FHWA and FTA therefore deferred approval of the STIP pending resolution of these issues. Although highway funding was held-up and TIP conformity could not proceed, this was not technically a "conformity lapse," having been caused by a funding dispute between FHWA and the state over the STIP.

**1995** – When trying to conform the FY 96-98 TIP, CTPS encountered problems with the build/no-build test for NO<sub>x</sub>, VOCs and CO due to a technicality in the way the conformity analysis is calculated. These problems arose because, for some milestone years, the build and no-build scenarios were the same. For example, in analysis of the 1996 milestone year, FY 96 was in both the no-build scenario (because it had already been conformed in the FY 95-97 TIP) and the build scenario. Because there had been no substantial, regionally significant changes made to projects, the analysis showed no decrease in emissions in the build scenario, which is required by the conformity rule. To solve the problem, CTPS added a CMAQ project to the TIP and did an off-model analysis to pass the test.

**1997** – The Boston metropolitan region could not pass the NO<sub>x</sub> build/no-build test due not to road projects but to high NO<sub>x</sub> emissions from diesel commuter trains. However, because the nonattainment area encompasses the entire eastern half of the state, Boston’s conformity analysis is combined with those of nine other MPOs. When Boston’s NO<sub>x</sub> emissions were averaged across the entire nonattainment area, passing the NO<sub>x</sub> build/no-build test was not a problem.

## CHARLOTTE

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Moderate (Redesignated to Attainment 1995)
Carbon Monoxide	Not Classified (Redesignated to Attainment 1995)

### Geographic Boundaries of Ozone Nonattainment Area:

**2 Counties:** Mecklenburg and Gaston.

### Geographic Boundaries of MPO Area:

**2 Counties:** Mecklenburg and Union.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	566,838				
1990	686,574	14,515,000	1.9% <sup>a</sup>		21.1
1995	760,939	18,442,000	2.0% <sup>b</sup>	4.9% <sup>b</sup>	24.2

<sup>a</sup>1980-1990

<sup>b</sup>1990-1995

### Institutions:

**MPO:** Mecklenburg/Union MPO, staffed by the Charlotte Department of Transportation

**State Transportation Agency:** North Carolina Department of Transportation (NCDOT)

**State Air Agency:** Department of Environment and Natural Resources (DENR)

### Summary of Conformity Issues:

**1994** – During its first conformity determination under the 1993 conformity rule, the area found that future VOC and NO<sub>x</sub> emission projections derived from the transportation plan were higher than the emission budgets in the ozone maintenance plan. Planners at the state air agency believed that the higher emissions in the transportation plan were due not to an actual increase in pollution, but to the difference between the methods used to calculate VMT in the base year for the emission budgets (using HPMS and other data) and that used to develop the new transportation plan (using the MPO's travel demand models). To rectify this problem, the area developed a reconciliation methodology that applied a corrections factor to the base-year inventories to make them comparable to the 1990 emission levels in the transportation plan. The air agency argued that once the difference in the base-year VMT calculations was reconciled, the area should conform if the emissions growth rate in the transportation plan stayed below the growth rate in the maintenance plan. Although the area passed conformity in 1994 using this methodology, EPA subsequently required that the area develop a technique that adjusted base-year VMT to match the SIP's base-year emissions inventory rather than vice versa, as any adjustments applied to the budget would require a SIP amendment. The state and MPO subsequently accomplished this.

**1996** – In 1995, the MPO had decided that a conformity analysis was not required since the projects in the new TIP came from a conforming plan and had not undergone any major changes. Later in the year, however, the air agency discovered an error in its emission budget calculations. When the error was corrected and the new, much lower budgets were used in the 1996 conformity analysis, the area showed substantial exceedances of both the VOC and NO<sub>x</sub> emission budgets, especially for the 2005 and 2015 analysis years. Charlotte continued to move forward grandfathered and exempt projects while the MPO, state DOT, and state air agency worked at the staff level to find a solution to this thorny problem.

**1997** – Charlotte’s conformity lapsed in January 1997. The area had enough grandfathered projects to continue building through the year with only three projects being held up by the conformity lapse. In late 1997, under pressure from the backers of one of the stalled projects, the Governor directed the transportation and air quality agencies to do whatever was necessary to resolve the lapse. However, by the end of the study period no resolution was forthcoming.



## DENVER

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Transitional
Carbon Monoxide	Moderate (reclassified to Serious 1997)
PM <sub>10</sub>	Moderate

### Geographic Boundaries of Ozone Nonattainment Area:

**6 Counties:** Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson.

### Geographic Boundaries of MPO Area:

**8 Counties:** Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin, and Jefferson.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,618,461				
1990	1,848,319	39,100,000	1.3% <sup>b</sup>		21.2
1995	2,085,158	50,900,000 <sup>a</sup>	1.7% <sup>c</sup>	4.5% <sup>d</sup>	24.4 <sup>e</sup>

<sup>a</sup>1996

<sup>c</sup>1990-1995

<sup>e</sup>Per capita rates are calculated using 1995 population and 1996 VMT.

<sup>b</sup>1980-1990

<sup>d</sup>1990-1996

### Institutions:

**MPO:** Denver Regional Council of Governments (DRCOG)

**State Transportation Agency:** Colorado Department of Transportation (CDOT)

**State Air Agency:** Colorado Department of Public Health and Environment (CDPHE)

**Lead Agency for SIP Planning:** Regional Air Quality Council (RAQC)

### Summary of Conformity Issues:

**1993** – Denver did not have difficulty satisfying the requirements of the interim conformity guidance. However, in anticipation of a more stringent final federal conformity rule, environmental advocacy groups strongly criticized a non-federal project proposed by a public toll authority. The advocacy groups feared that this project, the E-470 segment of a circumferential roadway, would open new land to development, creating more PM<sub>10</sub> emissions than planners were forecasting. The transportation agencies also had concerns about emissions from this project and sought assurances that E-470 would not jeopardize the area's ability to demonstrate conformity in the future. Project sponsors eventually agreed to certain specific mitigation measures and created an escrow fund to finance additional mitigation, if that proved necessary.

**1994** – During the conformity analysis of the 1994 TIP, transportation planners could not demonstrate that emissions in the final horizon year of the transportation plan (2015) would stay below the 1997 PM<sub>10</sub> budget of 44 tpd in the maintenance plan. The area lapsed for almost a year and advanced only grandfathered and exempt projects while it undertook the difficult and contentious task of amending the PM<sub>10</sub> budgets. Working together, transportation and regional air quality planners determined that the regional PM<sub>10</sub> emissions budget could be raised from 44 to 60 tpd – without either imposing new controls on stationary and area sources or causing violations of the NAAQS. This could be accomplished by adopting mitigation measures that would reduce 2015 emissions to the 60 tpd level in the Denver core, while allowing the permissible level of PM<sub>10</sub>

emissions to rise to the 60 tpd level in the suburban areas of the region. This proposal provoked months of controversy and criticism from environmental and public health advocates regarding the health effects of increased particulate levels. The state environmental agency approved this increase for only three years, which would have created conformity problems later on. The state legislature intervened to permit the increase for the full SIP period. The area was then able to conform the plan and TIP in 1995.

**1996** – Denver had difficulties in 1996 demonstrating conformity for the annual TIP revision. Having upgraded its transportation demand modeling, DRCOG found additional amounts of forecasted VMT and hence higher levels of PM<sub>10</sub> emissions from re-entrained dust and from NO<sub>x</sub> precursors of PM<sub>10</sub>. To resolve the PM<sub>10</sub> problems, DRCOG negotiated agreements with local governments to alter their street sanding and sweeping practices to reduce the dust kicked up by automobiles. To deal with the NO<sub>x</sub> problems the air agency, after discussions with stakeholders, committed to lower I/M NO<sub>x</sub> cut-points after 2001.

In 1996, Denver area environmentalists raised fiscal constraint issues during the conformity process. Arguing that the MPO was mitigating emissions from the E-470 tollway project by claiming credit for transit expansion projects that did not have secure funding, they threatened to sue on the grounds that the plan was not adequately fiscally constrained. The MPO counter-argued that the emission benefits of the transit projects were so small that the projects could be totally removed from the plan without threatening the conformity determination. Ultimately, no litigation was filed, and there was no delay in the conformity determination.

## HOUSTON

**Pollutant(s):** Ozone  
**1990 Classification:** Severe

**Geographic Boundaries of Ozone Nonattainment Area:**

**8 Counties:** Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller

**Geographic Boundaries of MPO Area:**

**13 Counties:** Austin, Brazoria, Chambers, Colorado, Fort Bend, Galvston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller, and Wharton.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	3,118,480				
1990	3,731,029	90,400,000	1.8% <sup>a</sup>		24.2
1995	4,164,393	105,800,000	2.0% <sup>b</sup>	3.2% <sup>b</sup>	25.4

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

**Institutions:**

**MPO:** Houston-Galveston Area Council (HGAC)

**State Transportation Agency:** Texas Department of Transportation (TxDOT)

**State Air Agency:** Texas Natural Resources Conservation Commission (TNRCC)

**Summary of Conformity Issues:**

**1994** - Houston had difficulty passing the VOC budget test. As a result of this, and also due to fiscal constraint difficulties, the large Grand Parkway project was scaled back and spread out over several years.

In 1994, Houston was also unable to pass the build/no-build test for NO<sub>x</sub> for ozone and, as a result, conformity was delayed while waiting for a NO<sub>x</sub> waiver.

**1995** - Houston was granted a temporary NO<sub>x</sub> waiver until 1997.

**1997** - Houston attempted its first conformity analysis using a 1999 VOC budget which tightened the emissions cap from the 1996 budget level. The conformity analysis showed that at the end of the twenty year planning horizon, Houston would not be below the 1999 levels for VOCs. By switching to modeled VMT estimates rather than HPMS VMT and by correcting for an over-estimation of VMT on local streets, the area revised the budgets and demonstrated conformity.



## MILWAUKEE

**Pollutant(s):** Ozone  
**1990 Classification:** Severe 2

**Geographic Boundaries of Ozone Nonattainment Area:**

**6 Counties:** Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha.

**Geographic Boundaries of MPO Area:**

**7 Counties:** Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,693,289				
1990	1,735,364	33,072,000	0.2% <sup>a</sup>		19.1
1995	1,780,769	35,900,000	0.3% <sup>b</sup>	1.7% <sup>b</sup>	20.2

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

**Institutions:**

**MPO:** Southeastern Wisconsin Regional Planning Commission (SEWRPC)

**State Transportation Agency:** Wisconsin Department of Transportation (WisDOT)

**State Air Agency:** Wisconsin Department of Natural Resources (DNR)

**Summary of Conformity Issues:**

The most significant conformity issue which confronted the Milwaukee area was passing the build/no-build tests, but this never caused the area a major problem or delay in making its conformity determinations. The Milwaukee area was helped in dealing with conformity by the results of a broad-based SIP planning task force was established through which all actors came to the table (including both public and private interests from mobile, stationary, and area sources) to evaluate various strategies for reducing emissions within each source category; to consider carefully the trade-offs among mobile, stationary and area source controls, and thus to set budgets with an understanding of their future implications.

**1995** - Milwaukee was saved from a conformity lapse by the February 1995 conformity amendments which increased the time for areas to submit complete SIPs to two years, effectively aligning the SIP conformity lapse with imposition of CAAA highway sanctions.



## NEW YORK

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Severe 2
Carbon Monoxide	Moderate 2
PM <sub>10</sub>	Moderate

### Geographic Boundaries of Ozone Nonattainment Area:

**10 Counties:** Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk, and Westchester.

### Geographic Boundaries of MPO Area:

**10 Counties:** Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk and Westchester.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	11,063,184				
1990	11,379,764	133,577,052	0.3% <sup>a</sup>		11.7
1995	11,462,260	132,284,161	0.2% <sup>b</sup>	-0.2% <sup>b,c</sup>	11.5

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995    <sup>c</sup>NYMTC does not regard the negative VMT rate for this period as indicative of future trends.

### Institutions:

**MPO:** New York Metropolitan Transportation Council (NYMTC)

**State Transportation Agency:** New York State Department of Transportation (NYSDOT)

**State Air Agency:** New York State Department of Environmental Conservation (DEC or EnCon)

### Summary of Conformity Issues:

**1994** - New York demonstrated conformity using qualitative analysis and sketch planning techniques.

**1995** - New York did not have the required network model in operation by the January deadline. The region advanced only exempt and grandfathered projects in 1995. New York's inability to develop the required modeling capacity stemmed in part from a state-mandated hiring freeze, which made adding technical staff or outside consultants impossible.

**1996** - The network based models continued to be non-operational through 1996. To compensate, the area sought and received a third-year extension of its 1994 TIP, continuing to advance only exempt and grandfathered projects.

**1997** - An interim network model was approved and New York was able to complete the required conformity analysis to adopt a new TIP.

## PHILADELPHIA

**Pollutant(s):** Ozone  
Carbon Monoxide

**1990 Classification:** Severe 1  
Moderate 1 (Redesignated to Attainment 1996)

**Geographic Boundaries of Ozone Nonattainment Area:**  
**5 Counties:** Bucks, Chester, Delaware, Montgomery, and Philadelphia.

**Geographic Boundaries of MPO Area:**  
**9 Counties:** Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania; Burlington, Camden, Gloucester, and Mercer in New Jersey.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	3,682,450				
1990	3,728,991	64,565,000	0.1% <sup>b</sup>		17.3
1995	3,731,703	70,195,000 <sup>a</sup>	0.0% <sup>c</sup>	1.4% <sup>d</sup>	18.8 <sup>c</sup>

<sup>a</sup>1996      <sup>c</sup>1990-1995      <sup>e</sup>Per capita rates are calculated using 1995 population and 1996 VMT.  
<sup>b</sup>1980-1990      <sup>d</sup>1990-1996

**Institutions:**

**MPO:** Delaware Valley Regional Planning Commission (DVRPC)  
**State Transportation Agency:** Pennsylvania Department of Transportation (PennDOT)  
**State Air Agency:** Pennsylvania Department of Environmental Protection (DEP)

**Summary of Conformity Issues:**

The most significant conformity issue which confronted the Philadelphia area was passing the build/no-build tests, but this never caused the area a major problem or delay in making its conformity determinations.

**1995 -** Philadelphia was saved from a conformity lapse by the February 1995 conformity amendments which increased the time for areas to submit complete SIPs to two years, effectively aligning the SIP conformity lapse with imposition of CAAA highway sanctions.

## PHOENIX

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Moderate (Reclassified Serious in 1997)
Carbon Monoxide	Moderate (Reclassified Serious in 1996)
PM <sub>10</sub>	Moderate (Reclassified Serious in 1996)

### Geographic Boundaries of Ozone Nonattainment Area:

**2 Counties:** Maricopa<sup>2</sup> and Pinal.

### Geographic Boundaries of MPO Area:

**1 County and Two Tribal Communities:** Maricopa County, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,600,093				
1990	2,238,498	49,600,000	3.4% <sup>a</sup>		22.2
1995	2,563,582	57,000,000	3.2% <sup>b</sup>	2.8% <sup>b</sup>	22.2

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

### Institutions:

**MPO and Lead Agency for SIP Development:** Maricopa Association of Governments (MAG)

**State Transportation Agency:** Arizona Department of Transportation (ADOT)

**State Air Agency:** Arizona Department of Environmental Quality (DEQ)

### Summary of Conformity Issues:

**1994** - Realizing that it would not be able to pass the build/no-build test for NO<sub>x</sub> as a precursor to ozone, Phoenix applied for a NO<sub>x</sub> waiver. This application process delayed the area's conformity determination by several months during which time MAG advanced only exempt and grandfathered projects. Phoenix was eventually granted a permanent waiver for NO<sub>x</sub>.

**1995** - Model enhancements to the area's existing network model briefly delayed conformity determination. MAG obtained the assistance of outside consultants for several years in order to improve its modeling capability.

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<sup>2</sup>Ozone nonattainment area only includes those parts of Maricopa county which are included in the Maricopa Association of Governments (MAG).

## PORTLAND

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Marginal (Redesignated to Attainment 1997)
Carbon Monoxide	Moderate 1 (Redesignated to Attainment 1997)

### Geographic Boundaries of Ozone Nonattainment Area:

**3 Partial Counties:** Clackamas, Multnomah, and Washington.

### Geographic Boundaries of MPO Area:

**3 Counties:** Clackamas, Multnomah, and Washington.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,050,418				
1990	1,174,291	20,413,000	1.1% <sup>a</sup>		17.4
1995	1,300,729	22,437,000	1.4% <sup>b</sup>	1.9% <sup>b</sup>	17.2

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

### Institutions:

**MPO:** Metropolitan Service District (Metro)

**State Transportation Agency:** Oregon Department of Transportation (ODOT)

**State Air Agency:** Oregon Department of Environmental Quality (DEQ)

### Summary of Conformity Issues:

**1994** - Portland experienced difficulties in interpreting the build/no-build requirements and as a result, the MPO incorrectly assigned projects to the baseline and action scenarios, invalidating the conformity analysis. When the mistakes were uncovered, the area decided to let conformity lapse for a year rather than expending the resources to re-do the analysis. All current projects were either exempt or grandfathered and therefore not affected by the conformity lapse.

**1996**- In developing its 1996 ozone attainment demonstration/maintenance plan, Portland took a proactive approach to future conformity determinations by setting emissions budgets for ozone precursors for the years beyond the milestone year of the maintenance plan. Quantifying its safety margin between total emissions in the attainment year (1992) and 2006, it gradually allocated part of its safety margin to create somewhat larger mobile source emission budgets for 2010, 2015, and 2020. This established a budget to accommodate some possible future VMT growth in the area.

Portland placed TCMs in the SIP specifically to ensure their implementation. Other areas were reluctant to place numerous TCMs into their SIPs as their presence could trigger a lapse of conformity if the area could not demonstrate timely implementation. Facing regular challenges in the legislature on the state growth management law, Portland included its urban growth boundary and related transit measures in the SIP to protect them from possible changes in the political climate.

## SALT LAKE CITY

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Moderate (Redesignated to Attainment 1997)
Carbon Monoxide	Not Classified
PM <sub>10</sub>	Moderate

### Geographic Boundaries of Ozone Nonattainment Area:

**2 Counties:** Davis and Salt Lake.

### Geographic Boundaries of MPO Area:

**5 Counties:** Davis, Morgan, Tooele, Salt Lake, and Weber.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	765,606				
1990	913,897	20,130,479	1.8% <sup>b</sup>		22.0
1995	1,023,7659	25,864,357 <sup>a</sup>	2.0% <sup>c</sup>	4.3% <sup>d</sup>	25.3 <sup>e</sup>

<sup>a</sup>1996      <sup>c</sup>1990-1995      <sup>e</sup>Per capita rates are calculated using 1995 population and 1996 VMT.

<sup>b</sup>1980-1990    <sup>d</sup>1990-1996

### Institutions:

**MPO:** Wasatch Front Regional Council (WFRC)

**State Transportation Agency:** Utah Department of Transportation (UDOT)

**State Air Agency:** Utah Department of Environmental Quality (DEQ)

### Summary of Conformity Issues:

**1993** - Salt Lake City submitted an attainment demonstration and maintenance plan for ozone rather than put forth a 15% SIP. Conformity was frozen until the SIP was found complete.

**1994** - The area had difficulty passing the NO<sub>x</sub> budget test for PM<sub>10</sub>. This was partially due to the region's previous SIP for PM<sub>10</sub> which had been developed in the late 1980's before the budget concept for pollutants or the conformity procedures. Additionally, the city's previous budget for NO<sub>x</sub> had used MOBILE 4 while the conformity analysis mandated MOBILE 5, which calculated much higher emissions from mobile sources. The area's conformity lapsed from November 1994 to October 1995. Advancing only grandfathered and exempt projects, the area tried to convince EPA that the budget problem was not the result of real increases in emissions but of differences in the way MOBILE 4 and MOBILE 5 projected NO<sub>x</sub> emissions. EPA was eventually persuaded and has since allowed the Salt Lake City area to use MOBILE 4 in the conformity analysis for NO<sub>x</sub> (as a precursor of PM<sub>10</sub>, but not of ozone).

In 1994, the area was also unable to show that at the end of the 2005 planning horizon the city would be within the approved levels for NO<sub>x</sub> for ozone. To correct this situation, the area extended the maintenance plan to 2015. By adding ten years to the budget, the area was able to demonstrate that, without adding any additional control measures to the SIP, NO<sub>x</sub> emissions could rise after the first ten years of the plan without causing a violation of the NAAQS.

**1995** - With the extended plan for ozone maintenance, the area was able to demonstrate conformity and has not experienced conformity problems since that time.

## SAN FRANCISCO

<b>Pollutant(s):</b>	<b>1990 Classification:</b>
Ozone	Moderate (Redesignated to Attainment 1995, Proposed Reclassification to Nonattainment, 1997)
Carbon Monoxide	Moderate 1 (Redesignated to Attainment 1998)

### Geographic Boundaries of Ozone Nonattainment Area:

**9 Partial Counties:** Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

### Geographic Boundaries of MPO Area:

**9 Counties:** Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	5,179,759				
1990	6,020,147	113,389,000	1.5% <sup>a</sup>		18.8
1995	6,302,933	123,666,900	1.3% <sup>b</sup>	1.8% <sup>b</sup>	19.6

<sup>a</sup>1980-1990    <sup>b</sup>1990-1995

### Institutions:

**MPO:** Metropolitan Transportation Commission (MTC)

**State Transportation Agency:** California Department of Transportation (Caltrans)

**State Air Agency:** California Environmental Protection Agency (CalEPA)

**Joint SIP Development Responsibility:** Bay Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), and MTC

### Summary of Conformity Issues:

**1989-** The Sierra Club Legal Defense and other environmental advocates brought a litigation challenge to MTC's modeling practices. The extensive model upgrades that MTC instituted as a result of settling the suit influenced the national politics reflected in the conformity requirements, and they positioned MTC to meet those requirements once 1993 regulations were promulgated.

**1996 -** In accordance with the settlement of a previous suit, MTC was obligated to incorporate into its ozone maintenance plan several TCMs which originated in the area's 1982 SIP. Due to the imprecise definitions of some of those TCMs, the BAAQMD and the EPA regional office questioned their timely implementation. In response, MTC supplied more detailed descriptions of the TCMs and the timelines for their implementation. MTC's response satisfied the air district and EPA that the conformity requirement was being met.



## ***APPENDIX III: INTERVIEW SUBJECTS BY STUDY SITE***

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

**Arnold M. Howitt and Elizabeth M. Moore**

Taubman Center for State and Local Government  
John F. Kennedy School of Government  
Harvard University

March 1999

*A Report to the  
U.S. Environmental Protection Agency  
and the  
Federal Highway Administration,  
U.S. Department of Transportation*

Publication Number  
EPA420-R-99-011

## **INTERVIEW SUBJECTS BY STUDY SITE**

### **ATLANTA**

#### **Atlanta Regional Commission**

Patti Schropp, Transportation Planning Division  
Denise Wright, Transportation Planning Division  
Jane Davis Hayse, Transportation Planning Division  
Wayne Hill, ARC Member; Chair, Gwinnett County Board of Commissioners

#### **Georgia Department of Transportation**

Frank Danchetz, Chief Engineer

#### **Georgia Department of Natural Resources**

Ron Methier, Chief, Air Protection Branch, Environmental Protection Division

#### **Metro Atlanta Chamber of Commerce**

Jeff Rader, Transportation Coordinator

#### **Georgia Power Company**

Chris Hobson, Manager of Environmental Affairs  
Myles Smith, Manager, Urban Affairs Department

#### **Environmental Defense Fund**

Michael Replogle, Co-Director, Transportation Project

#### **Georgia Conservancy**

Eric Meyer, Environmental Policy Analyst

#### **Automobile Association of America**

Ted Allred, Regional Director

#### **Federal Highway Administration**

Bob Radics, Intermodal Planning Engineer Manager, Georgia Division  
John Humeston, Director, Planning and Program Development, Region 4

#### **U.S. Environmental Protection Agency**

Eric Maurer, Environmental Engineer, Mobile Source Planning Unit, Air Programs  
Branch, Region 4  
Kay Prince, Chief, Regulatory Planning Section, Air Planning Branch, Region 4  
Kelly Sheckler, Environmental Scientist, Air Planning Branch, Region 4

## **BALTIMORE**

### **Baltimore Metropolitan Council**

Harvey Bloom, Director of Transportation

John Wing, Chair, Citizen's Advisory Committee

Steven Horn, Member, Transportation Steering Committee (the MPO); Chief of Planning,  
Carroll County Board of Commissioners

### **Maryland Department of Transportation**

Missy Drissel Cassidy, Manager, Air Quality Planning, Office of Systems Planning and  
Evaluation

Fred Rappe, Director, Systems of Planning and Evaluation

Rick Sheckells, Manager, Air Quality Planning, Office of Systems Planning and Evaluation

Howard Simons, Systems Analyst, Office of Systems Planning and Evaluation

### **Maryland Department of the Environment**

Diane Franks, Chief, Air Quality Planning, Air and Radiation Management Administration

### **Environmental Defense Fund**

Michael Replogle, Co-Director, Transportation Project

### **Federal Highway Administration**

Mario Jorquera, Air Quality Specialist, Region 3

Michelle Waxman-Johnson, Transportation Planner, Maryland Division

### **U.S. Environmental Protection Agency**

Paul Wentworth, Environmental Engineer, Ozone and Mobile Sources Section, Region 3

## **BOSTON**

### **Metropolitan Area Planning Council**

Dan Fortier, Chief Transportation Planner

### **Central Transportation Planning Staff**

Craig Leiner, Manager of Certification Activities

Anne McGahan, Senior Planner

Karl Quackenbush, Deputy Technical Director of Operations

### **Executive Office of Transportation and Construction**

Dan Beagan, Director, Bureau of Transportation Planning and Development

### **Massachusetts Bay Transportation Authority**

Andrew Brennan, Manager of Environmental Affairs

Anne Galbraith, Deputy Director of Planning

**Executive Office of Environmental Affairs**

Sonia Hamel, Director of Air Policy and Planning

**Massachusetts Department of Environmental Protection**

Christine Kirby, Manager, Transportation Planning Unit, Division of Air Quality Control

**Conservation Law Foundation**

Steve Burrington, Senior Attorney

**Federal Highway Administration**

Ed Silva, Planning and Research Engineer, Massachusetts Division

**U.S. Environmental Protection Agency**

Donald Cooke, Environmental Scientist, Region 1

**CHARLOTTE**

**City of Charlotte Department of Transportation**

William Finger, Assistant Director of Transportation

David McDonald, Transportation Planner

Joseph McLelland, Transportation Planner

**North Carolina Department of Transportation**

David Hyder, Charlotte Area Coordinator and Air Quality Specialist, Statewide Planning Branch

Marion Ron Poole, Branch Manager, Office of Statewide Planning

**Department of Environment and Natural Resources**

Deidre Hinkle, Environmental Engineer, Air Quality Section

Brock Nicholson, Assistant Chief for Planning, Air Quality Section, Division of Environmental Management

**North Carolina General Assembly (State Legislature)**

George Givens, Staff Attorney, Environmental Review Commission

**Sierra Club**

Molly Diggins, State Chair

William Holman, Lobbyist

John Tallmadge, Transportation Planner

**Environmental Defense Fund**

Michael Replogle, Co-Director, Transportation Project

**Federal Highway Administration**

Kay Batey, Planning and Program Development Engineer, North Carolina Division

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John Humeston, Director, Planning and Program Development, Region 4  
John Schrohenloher, Planning Engineer, North Carolina Division  
Joe Stevens, Planning Engineer, North Carolina Division

**U.S. Environmental Protection Agency**

Eric Maurer, Environmental Engineer Mobile Source Planning Unit, Air Programs Branch,  
Region 4  
Kay Prince, Chief, Regulatory Planning Section, Air Planning Branch, Region 4  
Kelly Sheckler, Environmental Scientist, Air Planning Branch, Region 4

**CHICAGO**

**Chicago Area Transportation Study**

Linda Bolte, Deputy Planning  
Andrew Plummer, Deputy Director  
Eugene Ryan, Associate Executive Director  
Bob Kaiser, Consultant; Senior Project Manager, Michael Baker, Jr., Inc.

**Chicago Department of Transportation**

Luann Hamilton, Assistant Director of Project Development, Administration and Planning  
John Tomczyk, Coordinating Planner II, Planning and Programming

**Illinois Department of Transportation**

Carla Berroyer, Chief, Urban Program Planning

**Illinois Environmental Protection Agency**

Toby Frevert, Manager, Air Quality Planning Section, Bureau of Air  
Mike Rogers, Environmental Protection Specialist, Bureau of Air

**Chicago Transit Authority**

Marty Johnson, Vice President, Capital Investment Department

**Illinois State Toll Highway Authority**

Ralph Wehner, Executive Director

**City of Batavia**

Jeff Schielke, Mayor

**METRA**

Jack Groner, Director, Grant Development and Programming  
Jerry Hoff, Department Head, General Development

**Business and Professional People in the Public Interest**

Robert Jones, Attorney

**Center for Neighborhood Technology**

Jackie Grimshaw, Coordinator

**Environmental Law and Policy Center**

Robert Michaels, Attorney

**Environmental Defense Fund**

Michael Replogle, Co-Director, Transportation Project

Robert Johnston, Professor, Department of Environmental Studies, University of California, Davis

**Federal Highway Administration**

Steve Call, Planner, Chicago Metropolitan Office

Jon-Paul Kohler, Urban Transportation Engineer, Illinois Division

Samuel Herrera-Diaz, Metropolitan Planning and Air Quality Specialist, Region 5

**U.S. Environmental Protection Agency**

Patricia Morris, Environmental Scientist, Air and Radiation Division, Region 5

**DENVER**

**Denver Regional Council of Governments**

Jeffrey May, Highway and Transit Planning Coordinator

David Pampu, Deputy Executive Director

**Office of the Mayor**

Theresa Donahue, Deputy Chief of Staff, City and County of Denver

**Colorado Department of Transportation**

George Gerstle, Section Manager, Air Quality and Cultural Resources

**Regional Transportation District**

Elizabeth Rao, Project Manager, Planning and Development

**Colorado Department of Public Health and Environment**

Karen Kudebeh, Conformity Liaison, Air Pollution Control Division

**Regional Air Quality Council**

Kenneth Lloyd, Executive Director

**Colorado Environmental Coalition**

Lauren Martens, Environmental Health Coordinator

**Norwest Technical Services, Inc.**

Dick Watt, Senior Vice President

**Spensley and Associates**

James Spensley, President

**Environmental Defense Fund**

Robert Yuhnke, Attorney

Michael Replogle, Co-Director, Transportation Project

**Federal Highway Administration**

Duwayne Ebertowski, Transportation Planner, Colorado Division

George Osborne, Division Administrator, Colorado Division

Robin Smith, Air Quality, Urban Transportation Planner, Region 8

**U.S. Environmental Protection Agency**

Jeff Houk, Environmental Engineer Air Program, Region 8

**HOUSTON**

**Houston-Galveston Area Council**

Alan Clark, Manager, Transportation Planning

Steve Howard, Program Director

Jacquie Lentz, Chief Air Quality Planner

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**City of Houston**

Charles Frederikson, Deputy, Assistant Director of Public Works

Dewayne Huckabay, Director, Finance and Administration Department, Office of Energy Management

**Texas Department of Transportation**

Roger Beall, Transportation Planner, Transportation Planning and Programming

Caroll Nixon, Transportation Planning Engineer, Houston-Galveston Regional Office

Eddie Shafie, Metropolitan Planning Manager, Transportation Planning and Programming

**Texas Natural Resources Conservation Commission**

Hazel Barbour, Mobile Source Manager, Air Quality Planning and Assessment Division

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**Metropolitan Transit Authority (METRO)**

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Linda Smith, Manager of Environmental Policy

**Blackburn and Carter**

James Blackburn, Environmental Attorney

**Greater Houston Partnership**

Roger Hoard, Vice President, Chamber of Commerce Division

**Office of the Governor**

John Howard, Environmental and Natural Resource Policy Director

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**Sierra Club**

George Smith, Air Quality Chair

**Federal Highway Administration**

George Hadley, Air Quality Specialist, Region 6

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**U.S. Environmental Protection Agency**

Jahanbakhsh Behnam, Air Planning Section, Region 6

Tom Diggs, Chief, Air Planning Section, Region 6

**MILWAUKEE**

**Southeastern Wisconsin Regional Planning Commission**

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**Wisconsin Department of Transportation**

Joe Crossett, Planning Analyst, Bureau of Environment

Sarah Dunning, Planning Analyst, Bureau of Environment

Jay Waldschmidt, Civil Engineer, Bureau of Environment

**Milwaukee County Transit System**

Kenneth Warren, Assistant Director

**Wisconsin Department of Natural Resources**

John Duffe, Transportation Specialist

Robert Lopez, Air Quality Analyst

**Federal Highway Administration**

Thomas Frank, Planning and Research Engineer, Wisconsin Division

Samuel Herrera-Diaz, Metropolitan Planning and Air Quality Specialist, Region 5



**Citizens for a Better Environment**

Bill Schaefer, Staff Attorney

**U. S. Environmental Protection Agency**

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**Wisconsin Roadbuilders Association**

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**NORTHERN NEW JERSEY**

**North Jersey Transportation Planning Authority**

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**New York Metropolitan Transportation Authority**

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**New York City Department of Transportation**

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**Tri-State Transportation Campaign**

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**Pennsylvania Department of Transportation**

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**Pennsylvania Department of Environmental Protection**

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**New Jersey Department of Environmental Protection**

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**City of Philadelphia**

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**Clean Air Council**

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**The PENJERDEL Council**

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**Federal Highway Administration**

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**U.S. Environmental Protection Agency**

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**PHOENIX**

**Maricopa Association of Governments**

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**City of Phoenix**

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**Arizona Department of Transportation**

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**Arizona Department of Environmental Quality**

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**Arizona Center for Law in the Public Interest**

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**Regional Public Transportation Authority**

Ken Driggs, Executive Director

**Federal Highway Administration**

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**U.S. Environmental Protection Agency**

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## **PORTLAND**

### **Metro**

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### **City of Portland**

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Douglas MacCourt, Environmental Manager, Office of Transportation, Engineering and Development

### **Clackamas County**

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Rod Sandoz, Planner

### **Oregon Department of Transportation**

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Steven Lindland, Civil/Environmental Engineer, Environmental Services  
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### **Oregon Department of Environmental Quality**

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Annette Liebe, Manager SIP Section, Air Quality Division

### **Tri-County Metropolitan Transit District of Oregon**

G.B. Arrington, Director, Strategic and Long Range Planning

### **1000 Friends of Oregon**

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### **Cascade Policy Institute**

John Charles, Environmental Policy Director

### **HDR Engineering, Inc.**

Irvin Lloyd, Transportation Projects Environmental Manager

### **Illingworth and Rodkin**

James Reyff

### **Oregon Economic Development Department**

James M. Whitty, Industry Development Division Manager

**Federal Highway Administration**

Fred Patton, Division Transportation Planner, Oregon Division  
Lisa Hanf, Air Quality Specialist/Metropolitan Planner, Region 10

**U.S. Environmental Protection Agency**

Wayne Elson, Region 10

**SALT LAKE CITY**

**Wasatch Front Regional Council**

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Mick Crandall, Program Director  
Matt Riffkin, former Planner; Consultant, Fehr and Peers Associates, Inc.

**Utah Department of Transportation**

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John Njord, Engineer for Urban Planning, Office of Program Development

**Utah Department of Environmental Quality**

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**Mountainland Association of Governments**

Kathy McMullen, Director, Regional Planning Department

**Parson, Behle, and Lattimer**

Shelly Cordon Teuscher, Director of Government Relations

**Sierra Club**

Nina Dougherty, Volunteer; Associate Director for Research, Spencer S. Eccles Health  
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**Federal Highway Administration**

Robin Smith, Air Quality-Urban Transportation Planner

**U.S. Environmental Protection Agency**

Jeff Houk, Environmental Engineer, Air Program, Region 8

**SAN FRANCISCO**

**Metropolitan Transportation Commission**

Chris Brittle, Planning Manager  
William Hein, Deputy Executive Director  
David Tannehill, Senior Planner

**Alameda County**

Edward Campbell, Supervisor, First District

**Contra Costa Transportation Authority**

Bob McCleary, Executive Director

**San Francisco Transportation Authority**

Brigid Hynes-Cherin, Executive Director

**California Department of Transportation**

J. Steven Borroum, Chief, Environmental Engineering, Office of Environmental Engineering

**California State Senate Transportation Committee**

Mehdi Morshed, Staff Director

**California Air Resources Board**

Anne Geraghty, Manager, Transportation Strategies Group

Tess Sicat, Office of Air Quality and Transportation Planning

Doug Thompson, Associate Transportation Planner, Executive Office, Transportation Strategies

**Bay Area Air Quality Management District**

David Marshall, Supervising Environmental Planner

Jean Rogenkamp, Manager, Planning and Transportation Section

**International Institute for Surface Transportation Policy Studies**

Rod Diridon, Executive Director

**Regional Alliance for Transit**

Matt Williams, Investment Adviser

John Woodbury

**Sierra Club Legal Defense Fund**

William S. Curtiss, Managing Attorney, San Francisco Regional Office

**Sierra Club**

John Holtzclaw

**Federal Highway Administration**

Karen Schmidt, Environmental Specialist, California Division

Robert O'Loughlin, Air Quality Specialist

**U.S. Environmental Protection Agency**

Mark Brucker, Environmental Scientist, Mobile Sources Section, Region 9

## **NATIONAL**

### **Federal Highway Administration, U.S. Department of Transportation**

Lucy Garliauskas, Division of Environmental Analysis  
Michael Savonis, Division of Environmental Analysis  
James Shrouds, Chief, Division of Environmental Analysis

### **Environmental Protection Agency**

Margo Oge, Director, Office of Mobile Sources  
Meg Patulski, Office of Mobile Sources  
Kathryn Sargent, Office of Mobile Sources  
Laura Voss, Office of Mobile Sources

### **Environmental Defense Fund**

Michael Replogle, Co-Director, Transportation Project  
Robert Yuhnke, Attorney

### **Surface Transportation Policy Project**

Hank Dittmar, Executive Director



**APPENDIX IV: SOURCES OF POPULATION  
AND TRANSPORTATION DATA**

**LINKING TRANSPORTATION AND AIR QUALITY PLANNING:  
IMPLEMENTATION OF THE  
TRANSPORTATION CONFORMITY REGULATIONS  
IN 15 NONATTAINMENT AREAS**

**Arnold M. Howitt and Elizabeth M. Moore**

Taubman Center for State and Local Government  
John F. Kennedy School of Government  
Harvard University

March 1999

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Publication Number  
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## *Appendix IV*

### **SOURCES OF POPULATION AND TRANSPORTATION DATA**

#### **Atlanta**

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/13.html> on December 17, 1998.

VMT Source: Atlanta Regional Commission, personal correspondence with Chris Chovan.

#### **Baltimore**

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties within ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/24.html> on December 17, 1998.

VMT Source: Maryland State Highway Administration, "A Baltimore Region Daily Vehicle Miles of Travel (In Millions of Miles by Jurisdiction for All Systems)" as supplied by Matthew M. De Rouville of Baltimore Metropolitan Council.

#### **Boston**

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/25.html> on December 17, 1998.

VMT Source: Boston MPO, personal correspondence with Ann McGahan, staff member of Central Transportation Planning Staff.

#### **Charlotte**

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/37.html> on December 17, 1998.

VMT Source: City of Charlotte, personal correspondence with Joseph McLelland, transportation planner.

#### **Chicago**

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/17.html> on December, 17, 1998.

VMT Source: Chicago Area Transportation Study, personal correspondence with Eugene Ryan, Associate Executive Director.

## Denver

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/18.html> on December 17, 1998.

VMT Source: Denver Regional Council of Governments, personal correspondence with Christopher Primus.

## Houston

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/48.html> on December 17, 1998.

VMT Source: Houston-Galveston Area Council, Personal correspondence with Jacquie Lentz, chief air quality planner.

## Milwaukee

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/55.html> on December 17, 1998.

VMT Source: Southeastern Wisconsin Regional Planning Commission, personal correspondence with Ken Yunker, Assistant Director.

## New York City

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/36.html> on December 17, 1998.

VMT Source: New York Metropolitan Transportation Council, Personal correspondence with Mary Vogel, staff member.

## Northern New Jersey

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/34.html> on December 17, 1998.

VMT Source: North Jersey Transportation Planning Authority, Personal correspondence with Julia Zhou, manager of regional and sub-regional modeling.

## Philadelphia

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/42.html> on December 17, 1998.

VMT Source: Delaware Valley Regional Planning Commission, personal correspondence with Ronald Roggenburk.

## Phoenix

Population source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/04.html> on December 17, 1998.

VMT Source: Maricopa Association of Governments, personal correspondence with Cathy Arthur.

## Portland

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/41.html> on December 17, 1998.

VMT Source: METRO Transportation Department, personal correspondence with Terry Whisler, senior transportation planner.

## Salt Lake City

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/49.html> on December 17, 1998.

VMT Source: Wasatch Front Regional Council, personal correspondence with Kip Billings, transportation engineer.

## San Francisco

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/06.html> on December 17, 1998.

VMT Source: Metropolitan Transportation Commission, "San Francisco Bay Area, County & Regional Vehicles Miles of Travel, Population and Employment: 1990-1995." Accessed from [http://www.mtc.ca.gov/facts\\_and\\_figures/misc/VMT9095.html](http://www.mtc.ca.gov/facts_and_figures/misc/VMT9095.html) on July 13, 1998.

## ***APPENDIX V: REPORT AUTHORS***

### **LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS**

**Arnold M. Howitt and Elizabeth M. Moore**

Taubman Center for State and Local Government  
John F. Kennedy School of Government  
Harvard University

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