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NEW POLITICS OF CLEAN AIR AND TRANSPORTATION

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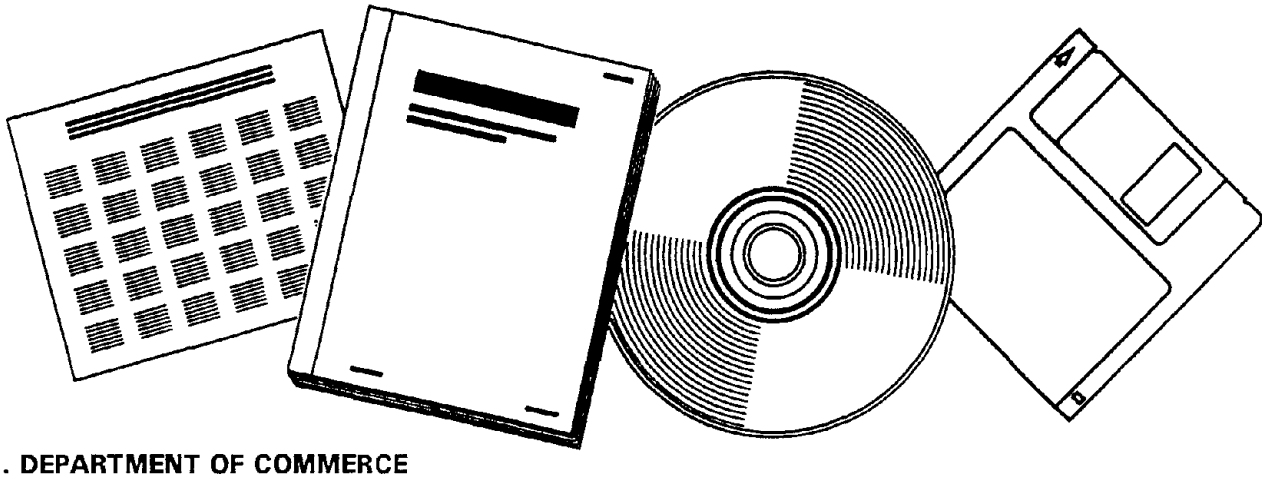

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The New Politics of Clean Air and Transportation

February 1997
Final Report

SEEING CLEARLY...A Series of Reports on Transportation and Air Quality

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13. ABSTRACT (Maximum 200 words)

This report, completed in 1994, focuses on the Clean Air Act (CAAA) and the State Air Quality Implementation Plan (SIP) and the need for conformity with transportation measures and policies. The Intermodal Surface Transportation Efficiency Act (ISTEA) has reinforced Federal regulations of transportation on behalf of air quality.

Preliminary results are presented from an ongoing study of implementation of the transportation provisions of CAAA and the air quality provisions of ISTEA to examine how well states and regions are meeting three persistent institutional and political challenges of earlier versions of CAAA:

- Enhancing organizational capacity in the core agencies - state air quality and transportation agencies and metropolitan planning organizations (MPOs)--responsible for carrying out Federal clean air mandates;
- Creating effective state and regional policies making arenas to frame and assess alternative policy options and make choices;
- Securing public consent for clean air policies that are adopted.

An initial assessment of how CAAA and ISTEA implementation is affecting state and metropolitan transportation operating policies and investment priorities is also made.

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PREFACE

This report was written by Arnold M. Howitt, Executive Director of the Taubman Center for State and Local Government, John F. Kennedy School of Government, Harvard University; Joshua P. Anderson, Research Coordinator at the Taubman Center, and Alan A. Altshuler, Academic Dean of the Kennedy School, Director of the Taubman Center, and Ruth and Frank Stanton Professor of Urban Policy and Planning, Kennedy School and Graduate School of Design. This research has been financially supported by the Federal Highway Administration (FHWA), the Environmental Protection Agency, and the U.S. Department of Transportation University Transportation Centers Program. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

In the interest of making this report available to a wider audience within the transportation and air quality community, this report, originally written in November 1994, is being reprinted.

This report is one in a series of publications produced or distributed by the Federal Highway Administration of the U.S. Department of Transportation to address important issues in transportation and air quality planning for metropolitan areas. Copies of this and other reports in this series can be ordered by calling 202-366-2069.

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1 inch (in) = 2.5 centimeters (cm)
1 foot (ft) = 30 centimeters (cm)
1 yard (yd) = 0.9 meter (m)
1 mile (mi) = 1.6 kilometers (km)

AREA (APPROXIMATE)

1 square inch (sq in, in^2) = 6.5 square centimeters (cm^2)
1 square foot (sq ft, ft^2) = 0.09 square meter (m^2)
1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)
1 acre = 0.4 hectare (ha) = 4,000 square meters (m^2)

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1 pound (lb) = .45 kilogram (kg)
1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)

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1 teaspoon (tsp) = 5 milliliters (ml)
1 tablespoon (tbsp) = 15 milliliters (ml)
1 fluid ounce (fl oz) = 30 milliliters (ml)
1 cup (c) = 0.24 liter (l)
1 pint (pt) = 0.47 liter (l)
1 quart (qt) = 0.96 liter (l)
1 gallon (gal) = 3.8 liters (l)
1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)
1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)

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1 centimeter (cm) = 0.4 inch (in)
1 meter (m) = 3.3 feet (ft)
1 meter (m) = 1.1 yards (yd)
1 kilometer (km) = 0.6 mile (mi)

AREA (APPROXIMATE)

1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)
1 square meter (m^2) = 1.2 square yards (sq yd, yd^2)
1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
10,000 square meters (m^2) = 1 hectare (ha) = 2.5 acres

MASS - WEIGHT (APPROXIMATE)

1 gram (gm) = 0.036 ounce (oz)
1 kilogram (kg) = 2.2 pounds (lb)
1 tonne (t) = 1,000 kilograms (kg) = 1.1 short tons

VOLUME (APPROXIMATE)

1 milliliter (ml) = 0.03 fluid ounce (fl oz)
1 liter (l) = 2.1 pints (pt)
1 liter (l) = 1.06 quarts (qt)
1 liter (l) = 0.26 gallon (gal)
1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)
1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)

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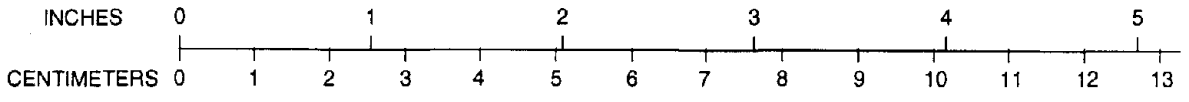

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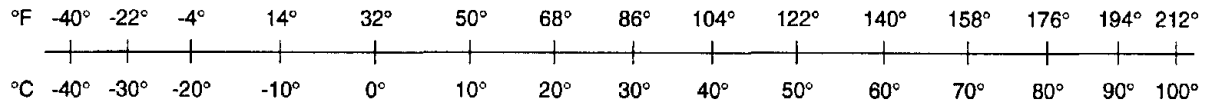

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1. INTRODUCTION

The enactment of legislation by Congress does not represent the end point of national policy making. Especially when Federal objectives must be carried out at other levels of government in the Federal system, passage of a new law marks the beginning of a process that determines whether the objectives of the law will actually be achieved.

In U.S. intergovernmental relations the Federal Government may command certain actions, but it cannot count on being obeyed. Except in those rare cases when it is literally prepared to impose its will by force (as it did to desegregate Southern schools), the Federal Government must persuade state and local governments to accept its policy directives by offering incentives such as grants-in-aid or by threatening to impose sanctions short of force. Even if states and localities comply, moreover, their actions may or may not produce the desired substantive results.[1]

In enacting the Clean Air Act Amendments (CAAA) of 1990 and reinforcing them through the air quality provisions of ISTEA of 1991, Congress devised an ambitious strategy for achieving national air quality goals. But the history of Federal efforts to reduce air pollution by State- and regional-level controls on transportation, primarily under CAAA of 1970 and 1977, is replete with institutional failures and political controversy. Achieving the goals of the new legislation requires overcoming the institutional and political problems that plagued its predecessors.[2]

Under the 1970 law, Congress gave the states tight deadlines to develop binding State Implementation Plans (SIPs) detailing how national air quality standards would be attained, by means including various forms of transportation controls. But transportation and environmental professionals had very little prior experience with transportation controls and lacked the organizational, technical, and financial resources necessary to fulfill the Federal mandate.

State and local governments had political as well as institutional difficulties in dealing with transportation controls. Many citizens strongly resisted proposed SIP provisions requiring changes in everyday behavior or increasing the costs of using transportation facilities. With very few exceptions, governors, big city mayors, and other influential elected officials were unwilling to spend their own political capital to advance EPA's goals and refused to implement transportation controls.

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[1]See, for example, Martha Derthick, *The Influence of Federal Grants* (Cambridge, MA: Harvard University Press, 1970); Helen Ingram, "Policy Implementation Through Bargaining: The Case of Federal Grants," Public Policy, Fall, 1977; Daniel Mazmanian and Paul Sabatier, Implementation and Public Policy (Glenview, IL: Scott, Foresman, 1983); Arnold M. Howitt, "Regulation in the Federal System: EPA and Transportation Controls," Paper delivered at the Annual Meeting of the American Political Science Association, Chicago, IL, September 1-4, 1983; and Howitt, "The Environmental Protection Agency and Transportation Controls," in Howitt, Managing Federalism (Washington, DC: CQ Press, 1984).

[2]See Arnold M. Howitt and Alan A. Altshuler, "The Challenges of Transportation and Clean Air Goals," Taubman Center for State and Local Government, John F. Kennedy School of Government, Harvard University, October 1992, for a more detailed summary of this history.

CAAA of 1977 sought to avoid many of these problems by requiring more integrated transportation and air quality planning, bringing elected officials more directly into the process, providing more opportunity for public participation, providing more planning money, and giving the Federal Government somewhat stronger sanctions with which to punish noncompliance. Generally, though, the procedural innovations of the 1977 CAAA failed to stimulate improved compliance. State and local officials remained unwilling to promote unpopular air quality measures. Although a new round of plans was completed, few states implemented even mild transportation controls.

2. RESEARCH ISSUES AND DATA SOURCES

Shortly after CAAA enactment in late 1990, an astute environmental advocate argued that this version would "remedy the failures of the 1970 and 1977 Acts: to achieve effective coordination between regional transportation planning and the attainment of air quality standards. For the first time, transportation planning will be given direct responsibility for achieving levels of vehicle use needed to reduce emissions. The 'Great Wall' separating transportation planners and air quality agencies will be breached. In its place, the law will link the development of transportation programs directly to the success of regional air quality plans. If transportation programs are not successful in achieving the emission reductions required for mobile sources, new highway projects or other facilities that promote single-occupant use will not be able to proceed."[3]

As experience under CAAA of 1990 and ISTEA of 1991 accumulates, it is appropriate to ask whether these new laws are making a difference. Have transportation and environmental planning become more closely integrated in service of the nation's air quality goals? Has this process had major impacts on transportation policy and investments? Have the political and institutional problems that hampered achievement of the goals of the 1970 and 1977 CAAA been ameliorated or resolved?

In this report, we relate preliminary results from our ongoing study of implementation of the transportation provisions of CAAA and the air quality provisions of ISTEA. First, we examine how well states and regions are meeting three persistent institutional and political challenges that plagued implementation of earlier versions of CAAA:

- Enhancing organizational capacity in the *core agencies* -- State air quality and transportation agencies and Metropolitan Planning Organizations (MPOs) -- responsible for carrying out the Federal clean air mandates;

- Creating effective state and regional policy making arenas in which to frame and assess alternative policy options and make choices;

- Securing public consent for the clean air policies that are adopted.

We also make an initial assessment of how CAAA and ISTEA implementation is affecting state and metropolitan transportation operating policies and investment priorities.

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[3]Robert E. Yuhnke, "The Amendments to Reform Transportation Planning in the Clean Air Act Amendments of 1990," *Tulane Environmental Law Journal*, Volume 5, No. 1 (December 1991), 252-253.

2.1 DATA SOURCES

This study is based on telephone interviews with participants in and knowledgeable observers of transportation and air quality planning in a number of metropolitan areas in 1992 and 1993;[4] personal interviews with a larger sample of individuals in three of these areas in 1994,[5] and personal interviews with a range of officials of the U.S. Environmental Protection Agency and U.S. Department of Transportation and of several national environmental organizations throughout this period.[6] We have also followed accounts of CAAA and ISTEA implementation in the general and specialized press and in scholarly and professional journals.

Our findings should be regarded as tentative, given the character of our data. Our information sources are best for the period concluding in November 1993, just after the 15% VOC reduction SIPs were due to EPA. Findings for subsequent periods are based primarily on the field research conducted in 1994 and press reports. We have very limited information about development of the 1994 ozone attainment demonstration SIPs.[7]

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[4]The main source of data is intensive telephone interviews with officials from ten nonattainment areas. In each area, about three to six informants, generally from the state air quality and transportation agencies and the MPO, were contacted in October and November 1993. The areas studied include five classified under CAAA as "severe" ozone nonattainment areas -- Baltimore, Chicago, Houston, Milwaukee, and Philadelphia; two "serious" areas -- Atlanta and Boston; and three "moderate" areas -- Charlotte, Phoenix, and Salt Lake City. In addition to these interviews, the first author conducted briefer telephone interviews in September 1992 with about a dozen state and regional officials from different states/metropolitan areas. Later that month, he chaired an all-day expert panel convened by EPA and DOT in Washington, D.C., in which these individuals reflected on their experiences with CAAA and ISTEA implementation.

[5]Field visits were made to Houston/Austin, Texas, in January 1994, and to Chicago/Springfield, Illinois, in June 1994. Field interviews were also conducted in the researchers' home territory of Boston during March and April 1994. In each of these areas, about 15-20 sources were interviewed, including state air and transportation officials, MPO staff, and interest group representatives.

[6]The interviews with Federal officials occurred during field research in Washington, D.C., in January 1993; and at EPA's transportation planning headquarters staff in Ann Arbor, Michigan, in March 1993 and July 1994. In addition, many telephone interviews were conducted with federal agency staff at various times during 1993 and 1994. The interviews with staff of the environmental organizations occurred at various times during these two years.

[7]We expect to follow up this research by another round of telephone interviews in the ten selected metropolitan areas, additional field trips, and further interviews with national government officials and interest group leaders.

3. CAAA AND ISTEA: THE NEW FRAMEWORK OF LAW

A brief summary of key provisions of CAAA and ISTEA sets the scene for our analysis.

3.1 CAAA OF 1990

The urban transportation provisions of CAAA of 1990 reaffirm the national commitment to the achievement of clean air standards. At the same time, they reflect an effort to learn from experience under the 1970 and 1977 Amendments. The new law does not contemplate full attainment of the national ambient air quality standards within a few years, as did those of 1970, nor does it require controls of the types (e.g., tolls and parking surcharges) that inspired such furor in the early 1970s.[8]

The new CAAA nonetheless has profound implications for transportation policy in "nonattainment" areas -- i.e., those areas, including virtually all major metropolitan areas, that do not meet Federal air quality requirements. The 1990 amendments provide that no transportation plan, program, or project may receive Federal funding or be approved if it does not "conform" to the state air quality implementation plan (SIP); that all "reasonably available" transportation control measures (TCMs) must be adopted, if necessary, to meet SIP goals and schedules; that various transportation pricing policies may be adopted; and that Federal sanctions may be imposed for failure to meet major CAAA milestones, including failure to implement SIP provisions.

Embodying a major change in regulatory strategy, however, the new CAAA does not impose the same requirements or deadlines for attainment on all nonattainment areas. Each must make year-by-year progress in actually reducing pollutant emissions, according to timetables and means that vary by the severity of their air quality problems.

Overall, the new CAAA requires much tighter integration of clean air and transportation planning at the regional level; and they seek to assure that the process for developing State Implementation Plans (SIPs) generates commitment by state and local actors with the capacity to allocate funds and implement control measures. The law requires designation of an agency in each area to develop the SIP. This agency must secure participation by local elected officials, representatives of the local air quality agency, the MPO, the State department of transportation, and the general public. The CAAA does not, however, authorize Federal funds sufficient even to cover the full state and local costs of the required planning, let alone to finance various transportation projects that might be necessary to achieve clean air goals.

3.2 ISTEA OF 1991

In enacting the Intermodal Surface Transportation Efficiency Act (ISTEA) in late 1991, Congress provided powerful reinforcement for Federal regulation of transportation on behalf of air quality.

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[8] CAAA authorizes such measures at local discretion, however.

ISTEA restates the nation's commitment to clean air goals, provides money for projects that promote air quality, forbids use of Federal funds for projects inconsistent with CAAA requirements, and increases the fiscal stakes of CAAA conformity procedures and sanctions.

ISTEA seeks overall to increase flexibility in using Federal funds, require broader participation in policy formation, and increase the decision making power of MPOs.[9] It authorizes funds for a six-year period, establishes new, broader funding categories, and reduces the differential incentive effects for use of Federal funds that different matching requirements created. For example, the Surface Transportation Program essentially collapses two previously separate categories into one block grant for roads, transit, transportation enhancement, and safety projects. But restricted programs remain, and the capacity to shift funds from one use to another is not absolute.

One new funding category, the Congestion Mitigation and Air Quality (CMAQ) program, was explicitly designed to finance projects included in SIPs or otherwise contributing to emission reductions or congestion relief.[10] Surface Transportation Program and Transit grants can also be applied to projects required under CAAA. ISTEA thus serves as a potential funding source for CAAA goals, compensating to some degree for the dearth of Federal aid provided by that legislation.

Taken together, CAAA and ISTEA effectively make air quality the dominant constraint on the nation's transportation programs. Should states and localities resist air quality requirements, CAAA provides the Federal Government with two important transportation-related tools to stimulate compliance. CAAA requires withholding of Federal transportation grants for state failure to comply with certain provisions. In addition, the conformity language of CAAA prevents use of ISTEA funds for all purposes (with a few exceptions), if a transportation plan or program is at odds with policies in a nonattainment area's SIP.

Nonetheless, as experience under CAAA of 1970 and 1977 clearly indicates, the framework of law is only part of the story of state-local response to Federal air quality and transportation policy. And it is on the political and institutional challenges, identified above, that the current paper concentrates.

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[9]For an excellent brief summary and interpretation of ISTEA, see "The Public's Capital," *Governing Magazine* (1992), pp. 65-76, upon which the following account draws.

[10]Funds for this program are apportioned on the basis of a state's percentage of the nation's total population living in nonattainment areas, weighted by a factor linked to the classification of the area's air quality problems in CAAA.

4. BUILDING ORGANIZATIONAL CAPACITY

Virtually since enactment of CAAA, the core public agencies at the state and regional levels have faced enormous stress from the demanding workloads, tight deadlines, and political sensitivity of the required implementation tasks. Moreover, ISTEA made the roles and relationships of state and metropolitan transportation entities significantly more complicated, most notably by giving the MPOs more decision-making authority and by requiring them to "bring new parties to the table." To comply with these requirements, the core agencies, especially in the nonattainment areas with the more severe air quality problems, have needed to enhance organizational capacity substantially.

Much of the activity has focused on preparation of a set of integrated, technically complex, formal analyses or planning documents which CAAA and ISTEA require to assure that transportation plans, infrastructure investments, and patterns of transportation use are consistent with the timely achievement of national air quality standards. These requirements include a sequence of SIP submissions; long-range transportation plans; transportation improvement programs (TIPs) allocating Federal grant funds; several required management systems under ISTEA, particularly for congestion management; and the conformity determinations by which air quality and transportation plans are made consistent.

"Baseline" capacity varied widely among core agencies in different states and regions; and the process of organizational development has typically been difficult and uneven, leaving some jurisdictions short of the capacity appropriate for the new Federal requirements. Nonetheless, significant improvement in capacity to deal with CAAA and ISTEA issues has in fact occurred in many states. These changes have been driven partly by internal determination of the need for greater expertise and manpower and partly by external pressure from environmental advocacy groups and Federal agencies.

Generally, both transportation and air quality agencies have increased the number and skills of their professional staff (by new hiring or internal reassignments), or have retained consultants, or both. They have also notably increased their cross-functional expertise, the lack of which was a major impediment to inter-agency cooperation and effective implementation of earlier versions of CAAA. On one side, transportation agencies have enhanced their institutional knowledge of air pollution issues; while on the other, air quality agencies have substantially increased their awareness of transportation policy processes. In addition, in most jurisdictions, agency technical capacity, especially for quantitatively modeling transportation patterns and air quality effects, has improved to some degree; and in some states, data, planning techniques, and procedures have become more sophisticated.

However, many practitioners feel hard-pressed by the technical requirements of CAAA and ISTEA and frustrated by what they perceive as unrealistic expectations for improvements in technical capacity. These concerns are coming to a head as the November 1994 deadline for ozone attainment demonstration SIPs approaches.

4.1 STAFF EXPANSION AND CROSS-FUNCTIONAL EXPERTISE

4.1.1 MPOs

At the regional level, many Metropolitan Planning Organizations (MPOs) have increased professional staffing, sometimes dramatically. A national survey conducted by the National Association of Regional Councils (NARC), U.S. DOT, and U.S. EPA found that half the responding MPOs had hired new staff to "address air quality issues."[11] Another study found that "clearly, nonattainment is *the* transportation issue in those cities that have severe problems," with 45-50 percent of the staff resources at MPOs in "severe" ozone nonattainment areas being devoted to CAAA activities.[12] Many MPOs have also retained consultants to handle specialized aspects of their planning tasks. This expansion, it appears, has often been financed by ISTEA planning funds.

In our own sample, the Atlanta Regional Commission (ARC) added six new members to a nine-person transportation planning division in 18 months, while the Houston-Galveston Area Council more than doubled its transportation staff after enactment of CAAA and ISTEA. MPOs that already had substantial planning staffs -- such as the Chicago Area Transportation Study and the Philadelphia area's Delaware Valley Regional Planning Commission -- have reassigned personnel to deal with air quality planning. As one informant from the Phoenix MPO put it hyperbolically: "We used to be a transportation agency that did a little air quality; now we are an air quality agency that does a little transportation."

Despite such change, many MPOs continue to feel understaffed. The NARC/DOT/ EPA survey found that 70 percent of all MPOs (ranging from 55 percent of marginal MPOs to 78 percent of moderate MPOs) report having inadequate numbers of staff to address CAAA requirements.[13]

While the pace and volume of work confronting MPOs explains this finding in large measure, other factors seemed to be operating as well: a dearth of appropriately trained and experienced candidates for technical planning positions (several MPOs in our sample noted their problems in finding qualified modelers), and a political climate in some jurisdictions that makes it difficult to expand public agency staffs.

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[11]Elizabeth A. Deysher and Denise A. Spadafora-Rodriguez, "Implementing the Clean Air Act Amendments of 1990: Analysis of Metropolitan Planning Organizations' Needs," U.S. Department of Transportation, Research and Special Programs Administration, Volpe National Transportation Systems Center (SS-49-HW465-1), November 1993, p. 4.

[12]David T. Hartgen, Walter E. Martin, and Andrew J. Reser, "Nonattainment Areas Speak: Present and Planned MPO Responses to the Transportation Requirements of the Clean Air Act of 1990," Department of Geography and Earth Sciences, University of North Carolina at Charlotte, May 18, 1993, pp. 6-7.

[13]Deysher and Spadafora-Rodriguez, p. 4.

4.1.2 State Transportation and Air Quality Agencies

At the state level, most agencies have managed to get a few new hires for transportation and air quality planning; and some have expanded significantly (notably the staff of the former Texas Air Resources Board, now part of the consolidated Texas Natural Resource Conservation Commission). Most have had trouble, however, getting what they think they need. The political constraint appears to have been even more severe at the state level than in regional agencies. For example, in our sample, legislated restrictions on state hiring have reportedly kept Utah DOT from participating meaningfully in SIP preparation (although the Utah Division of Air Quality has increased its mobile source staff). And some state agencies have suffered sharp staff cuts -- for example, the Massachusetts Department of Environmental Protection and the Maryland Department of Environment.

In some instances, state agencies have compensated for their inability to hire regular staff by hiring consultants, who have also been retained to do short-term technical work, such as enhancing modeling capacity.

4.2 IMPROVED MODELING

CAAA and ISTEA require a set of linked analyses and planning documents. Several types of computer simulation models are involved, including those forecasting transportation demand, auto emissions, and atmospheric dispersion of air pollutants.[14] Conducting these analyses requires collecting quantitative data about transportation and air pollution patterns; inputting this data into the computer simulation models to estimate the current volume of emissions or transportation demand and to forecast changes in future time periods; and then modeling the likely impact of new transportation facilities or various kinds of regulatory restrictions on future transportation behavior and emissions.

The technical sophistication required to conduct the necessary analyses and produce the mandated plans has increased at successive stages of CAAA implementation. This has created significant pressure on regional and state agencies to improve the quality of available data and their capacity for modeling and technical analysis. In the short-run, most have adapted existing technical tools on an ad hoc basis. Many state and regional agencies have also initiated staff and financial investments to produce longer-range improvements in data collection and modeling capacity. The Baltimore MPO, for example, has conducted a major transportation behavior survey, updating decades-old information.

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[14]See U.S. Department of Transportation and Environmental Protection Agency, "Clean Air Through Transportation: Challenges in Meeting National Air Quality Standards," August 1993, pp. 51-52, for a succinct description of the relationships between transportation demand and emission models. See also Greig Harvey and Elizabeth Deakin, *A Manual of Regional Transportation Modeling Practice for Air Quality Analysis*, National Association of Regional Councils, July 1993, for a more extended discussion of the modeling issues involved in CAAA and ISTEA implementation.

The required technical work, however, has involved using the models for analyses that go well beyond the purposes for which the models were designed. Serious questions have been raised about the validity of the analytic outputs and the inferences drawn from them -- especially for a regulatory process that requires making "precise" forecasts of pollution levels to determine compliance with threshold standards. (This issue and its policy-making consequences will be discussed below in the section on "Technical Planning.")

Even with the improvements achieved to date, therefore, many practitioners in the core state and regional agencies continue to feel hard-pressed by the technical requirements of transportation and air quality planning. They express frustration that the increasing expectations of the regulatory process are unrealistic in light of the technical "state-of-the-art" and the limited resources and time available to effect needed changes.

Organizational capacity remains a significant issue. The next steps in CAAA and ISTEA implementation significantly escalate the demands on agency capacity. First, the ozone attainment demonstration SIPs due to EPA in November 1994 require areas classified "serious" and above to conduct analyses of air pollution utilizing photochemical grid modeling. This technique -- recommended for "moderate" nonattainment areas as well -- demands very detailed data inputs and is a new endeavor for most air quality agencies. Second, conformity analyses under EPA's final transportation conformity regulation require enhanced skills and procedures, and many specific new tasks must be performed. As a result, there is widespread concern that modeling difficulties may make it difficult for State agencies and MPOs to meet the 1994 attainment SIP deadline and satisfy the conformity requirements.

5. CREATING POLICY-MAKING ARENAS

5.1 CHALLENGES OF GOVERNANCE

Implementation of the transportation planning provisions of earlier versions of CAAA faltered in part because the core state and regional agencies failed to engage each other and key interest groups in collaborative policy making and day-to-day working relationships. As a consequence, no effective policy-making arenas were created within which states and localities could devise and carry out pollution reduction policies; and there was virtually no connection between pollution reduction efforts and transportation policy making.

The new legislation addressed these problems to some degree, especially by mandating broad participation in planning, requiring consistency among CAAA and ISTEA planning products, enforcing this linkage through conformity procedures, and providing for a policy-making "solvent" through easier use of transportation funds for air quality purposes. The procedures of the two Federal laws, however, provided few incentives for policy closure except the compliance schedule and the threat of sanctions, which, while stronger and more realistic than under previous clean air legislation, remained untested. Consequently, the new laws left officials at the state and regional levels with daunting governance challenges to work out as the implementation process unfolded.

5.1.1 Eliciting and Managing Participation[15]

CAAA and, particularly, ISTEA require broad participation in transportation policy making and in program and project implementation. The range of government entities alone is broad, including both air quality and various modal transportation agencies. Their number is increased by the frequent separation of planning and operating organizations and by the proliferation of institutions representing many distinct, but often geographically overlapping, state, regional, county, and local jurisdictions. Elected officials, too, not just the bureaucracy, are expected to be involved. Effective participation is also desired from a wide range of nongovernmental groups (e.g., business, environmental, and community groups), and by the public at large.

The architects of CAAA and ISTEA saw participation as perhaps the crucial means of preventing the conflicts that stymied earlier efforts to regulate transportation for air quality purposes. It is through the tugging and hauling of diverse participants, many believed, that policy options can best be devised, debated, and weighed; priorities set; difficult decisions reached; and plans actually carried out.

In most metropolitan areas, however, effective channels of communication and the procedures necessary to elicit and focus widespread participation existed, if at all, only in nascent form at the

[15]This subsection and the next are adapted with minor changes from Arnold M. Howitt and Alan A. Altshuler, "Regional Governance: Challenges of CAAA and ISTEA," *TR News*, July-August 1993, pp. 19-20.

time CAAA and ISTEA were enacted. And the institutional requirements of the two Federal laws are extremely complex. One senior MPO staff member has described the situation as "a football game with half a dozen teams running around."

In fact, there are ***two*** games, involving policy systems which previously had been only very loosely linked: transportation and air quality. When CAAA and ISTEA were enacted, many of the "players" -- governmental as well as nongovernmental -- were "rookies" in at least one of the games. The effectiveness of the legislative design of the two acts depended on how well the players got involved, learned the issues, discovered how to play the game in time to have the expected impact on decisions.

Given the fast pace established by CAAA and the ISTEA schedules, the outcome was in doubt. Would transportation agencies and constituencies effectively participate in the SIP-writing process, or would critical decisions, especially about the emission budget for transportation, be made with inadequate input? Would environmentalists master the transportation planning and resource allocation process in a timely fashion?

5.1.2 Reconciling Divergent Goals

CAAA and ISTEA effectively proclaim air quality as the primary goal of -- or dominant constraint on -- U.S. transportation policy. In practice, however, the participants have a much wider array of goals. Many environmentalists, for example, while committed to reducing air pollution, also regard air quality regulation as a policy lever for the pursuit of broader objectives: to control urban sprawl, reduce auto use, encourage energy efficiency, and promote a particular "quality of life" vision. For the transportation community, a broader agenda -- mobility, economic competitiveness, growth -- is also at stake. In both camps, opinion is divided about how to balance these goals and what strategies are desirable and feasible. Some transportation interests, for example, seek to reduce the level of congestion in a context where little new road building is possible, while others want freedom to add new capacity. Besides the environmentalists and transportation interests, moreover, some other groups are promoting very specialized goals -- for example, access for the handicapped -- as their top priority.

At the time CAAA and ISTEA were enacted, it was not clear whether and how these different agendas could be reconciled, especially in those areas with the most acute air quality problems. Given experience under the predecessors of CAAA, substantial political conflict was anticipated.

5.2 IMPROVED WORKING RELATIONSHIPS AMONG THE CORE PUBLIC AGENCIES

As the process has unfolded, one of the most notable features of CAAA implementation has been the development of far closer working relationships among the core public agencies -- state air quality agencies, State transportation departments, and metropolitan planning organizations.

Relationships among these agencies have certainly not been frictionless. In some jurisdictions, mutual suspicions have been slow to break down; working relationships are still guarded; substantial disagreements about goals and priorities exist; and significant policy differences -- sometimes latent, sometimes overt -- remain unresolved. These differences emerged especially in regard to the content and implementation of the Federal conformity regulation, promulgated in preliminary form in January 1993 and in final form late in 1993.

Nonetheless, imperfect as it is, the degree of collaboration described by the informants in our study stands in striking contrast to the general lack of interaction, intermittently punctuated by sharp conflicts, that prevailed under earlier versions of CAAA. Even in jurisdictions that have experienced tensions in relationships between transportation and air quality agencies, the degree of collaboration has increased markedly as compared to the pre-1990 period. Consequently, the previously separate processes of transportation and air quality regulation are better integrated than at any earlier time.

While collaboration has occurred among both staff and appointed policy officials, the strongest relationships as of late 1993 had been forged among the *policy professionals* -- paid specialist staff members -- in the core public agencies and, as will be discussed below, in major interest groups as well.[16] These individuals constituted an *inner circle* of clean air and transportation policy making.

Across the country, transportation and air quality professionals -- many of whom had literally not met prior to CAAA enactment -- are now working together more closely. For example, in the Philadelphia area, the Delaware Valley Regional Planning Commission and the Pennsylvania Departments of Transportation and Environmental Resources have shared data, consultants, and planning funds. They have interacted so intensively at times that one state DOT official comments jokingly that she forgets which agency she works for. This experience seems to have been widely shared.[17]

In many states, "coordinating committees" formed in the wake of CAAA have been the starting point for closer collaboration between transportation and air quality professionals. In Maryland, for example, the Department of Transportation (MDOT) and the Department of the Environment

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[16]According to Paul E. Peterson, Barry G. Rabe, and Kenneth K. Wong, *When Federalism Works* (Washington, D.C.: The Brookings Institution, 1986), "policy professionals probably have done little to integrate and coordinate overall federal policy, but within policy domains they have been much more valuable" as the facilitators of vertical coordination in the federal system (p. 160). One of the striking features of CAAA/ISTEA implementation, however, has been the degree of coordination between policy specialists *across* the formerly separate policy domains of transportation and air quality, at the state and local level, on one hand, and at the federal level on the other.

[17]"Together the CAA [sic] and ISTEA have established a new plateau regarding links between state and local agencies. A common foundation and better cooperation exists between air quality and transportation agencies than has ever existed in the past." This conclusion was cited as one of the "major/most repeated points" at a May 1994 workshop in Baltimore which brought together "about 220 participants, mostly from the transportation and air quality communities." See "Mobility/Air Quality Workshop Stakes Out Common Ground," *Clean Air/Transportation Report*, National Association of Regional Councils, June 1994, p. 7.

(MDE) established a "joint task force" in 1991. It met monthly through 1993, including anywhere from 14 to 20 people from the two agencies, with agendas set jointly by MDOT and MDE administrators. In the words of one of our informants, the task force "really paid off" in improving interagency relationships and smoothing CAAA implementation. That observation is echoed with respect to a similar "technical working group" formed in Texas, which has included MPOs and Federal agencies in addition to state agencies. This group, a participant comments, "has really worked well. It has got everyone together to keep a dialogue open and to get us through Federal regulatory hoops."

5.2.1 Recognition of Interdependence

State agency participants, of course, are typically linked through a hierarchy of authority running to the governor's office and by the recognition that important gubernatorial political interests may be at stake. While governors vary in the degree to which they have actively sought to shape transportation and air quality policy, the possibility of their intervention to resolve policy disputes has sometimes pushed state environmental and transportation agencies into closer working relationships.

More generally, however, the core agencies have been driven together by their interdependence under CAAA and ISTEA. This recognition has perhaps been most telling in the transportation community, as state DOTs and MPOs have realized the potential for mandatory CAAA sanctions to cut off the flow of Federal transportation dollars. As one official from the North Carolina Department of Transportation notes, "we got involved in the air quality business because of the realization that sanctions could be levied because of failure in the Department of Environmental Management's required submissions. So we started knocking on their door in January of 1992, saying 'when you start developing the SIP..., we want to be sitting at the table.'"

Air quality administrators, for their part, have recognized the extent to which the success of their CAAA implementation efforts depends on the cooperation of transportation agencies. DOTs and MPOs are regulatory targets of the law, required to develop "conforming" long-range plans and TIPs; their resistance to the process would pose a major problem for environmental agencies. Transportation agencies also tend to command substantial resources -- often more than environmental agencies possess. They can provide the latter with key data and modeling expertise, allocate flexible transportation money to specific emission reductions measures, and mobilize their influence in support of CAAA implementation.

Indeed, air agencies in every state in our study have called on these resources for assistance, sometimes extensively. The most common form of requested assistance has been in modeling transportation emissions. Many air agencies have also delegated responsibility for assessing possible transportation control measures to MPOs, relieving themselves of a heavy drain on their own technical and political resources. DOTs and MPOs in many states, in addition, have passed money along to air agencies in one form or another -- for example, by allocating transportation dollars to inspection and maintenance implementation, as in Georgia or Illinois, or by transferring planning money or sharing consultants, as in Pennsylvania.

One official from the Wisconsin Department of Natural Resources described in explicit terms the nature of the exchange involved in establishing cooperative inter-agency relationships: "We have gone after partnerships with other agencies, and given up some authority in this process, giving [the State] DOT a much greater role up front. They're demanding it, and we're providing it.... One thing we have bought in return for opening up our process is real input in the CMAQ funding allocation process."

This then is clearly one area where the legislative design of CAAA has worked in its intended direction by creating a set of incentives, tied to the vital programmatic interests of the core agencies, that have drawn transportation and air quality professionals into more collaborative relationships. By no means, however, has it eliminated substantive differences over goals and policy.

5.2.2 Disagreements Over Conformity

As of late 1993, the most widespread issue of controversy among the core agencies concerned the drafting of a final transportation conformity rule by U.S. EPA. With some exceptions, notably in Georgia and Illinois, air quality and transportation agencies in state after state lined up on opposite sides of almost all major questions during the two-year conformity debate. Typically, they followed positions taken by their respective national organizations, the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ ALAPCO) and the American Association of State Highway and Transportation Officials (AASHTO).

As will be discussed below, current and future steps in CAAA/ISTEA implementation -- most immediately, implementing the conformity regulation and developing the 1994 ozone attainment demonstration SIPs -- may well engender further conflict in a number of jurisdictions.

5.3 BUSINESS INTERESTS AND ENVIRONMENTAL ADVOCACY GROUPS

Through late 1993, the policy professionals in government were clearly the dominant players in CAAA/ISTEA implementation efforts. In most states and regions, however, major interest groups with sufficient resources to assign staff members to transportation and air quality issues have actively sought to shape policy outcomes. Typically, these organizations have been business associations and environmental advocacy groups.

5.3.1 Business Interests

Business groups have been the single most active type of participant. In some jurisdictions, business "umbrella" groups have energetically sought to shape public policy as it was developed -- for example, in the formative stages of SIP drafting. In other locations, business involvement has been primarily reactive, mobilizing to oppose proposed SIP provisions. Even in those areas where business has participated in the formative stages of SIP development, however, some elements of the business community have organized in opposition to specific SIP provisions.

In a few cases, business participation was highly organized and comprehensive. In Houston, one of Texas' four nonattainment areas, the business community, led by the Greater Houston Partnership, was an important force in the SIP policy process. Led by oil, gas, and chemical interests, the business community determined early on that it had vital interests at stake in the way CAAA implementation proceeded. Not only was it interested in minimizing regulation of "stationary sources" by concentrating on transportation-related emission reduction measures, it also feared the consequences of failure on the region's part to meet CAAA requirements -- namely, a mandatory "2-for-1 offset" sanction that would act as an effective industrial growth moratorium.

The Houston business community therefore took the position that compliance with CAAA requirements was crucial to the city's economic future; and it was willing to seek consensus on pollution control options with local environmental groups. Business participants not only developed considerable expertise on the policy issues but also provided funds to make photocopies, print brochures, and pay for public service announcements; and they have donated considerable time and skills, including legal expertise.

Although the Houston business community has been exceptionally active, business organizations have been prominently involved in virtually every nonattainment area. In Boston and some other areas, business groups have played leading roles in advisory panels broadly examining SIP policy questions. In still other areas, however, they have participated more selectively in SIP policy making, either because they were less aware of the CAAA requirements, or felt less threatened by them, or simply took them less seriously.

Sometimes business interest has focused on a particular policy, such as employee commute options (ECO) or enhanced inspection and maintenance (I/M), as will be discussed below. Frequently, business groups have not become truly engaged until late in the policy making process when they felt threatened by particular policy proposals. Sometimes such opposition has emerged from specific subgroups of the business community -- for example, retail merchants -- despite earlier backing by organizations or advisory groups representing a broader spectrum of business.

5.3.2 Environmental Advocates

Environmentalists have also been important participants in some states. In Massachusetts, the Conservation Law Foundation has been an extremely active and influential player, financially capable of committing its own policy and legal staff or retaining consultants to help shape transportation and air quality planning. In Philadelphia, the Delaware Valley Clean Air Council has also brought several full-time staff to bear on transportation and air quality issues.

Such capacity is unusual, however. Few environmental groups have sufficient resources and expertise to match the involvement of their business counterparts, let alone the public agencies. They sometimes allocate their attention to other aspects of clean air policy or to other environmental issues altogether. In Chicago, the environmental community, which includes several groups with professional staff, has not been an influential participant in transportation policy. And in many areas, the environmental community is relatively weak. In Texas, for instance, the few

state-level staff of environmental groups have concentrated on issues other than transportation. The environmental movement in Houston is therefore represented by a few volunteers, who, unlike the representatives of the business community, sometimes have difficulty taking time off from their full-time occupations to attend advisory committee meetings.

Where environmental advocates are comparatively weak, they nonetheless frequently exercise disproportionate influence. They enjoy ready access to the press, almost always being consulted as spokespersons for their "side" by reporters preparing clean air stories. Furthermore, their capacity to initiate litigation gives them leverage, even in jurisdictions like Arizona where they carry limited weight with elected officials. Even when they make no overt threat to sue, the possibility that litigation might cause delay and expense -- not to mention attract sympathetic attention from Federal regulators -- gives them standing in state and regional policy deliberations. In some cases, moreover, the support of environmental advocates for specific policies such as enhanced I/M provides additional public legitimacy for positions that may also be taken by public agencies or business interests.

5.4 SIP DEVELOPMENT

How have these actors worked together to produce State Implementation Plans, and what policies have been incorporated?

5.4.1 Patterns of Participation

The core public agencies have generally made significant efforts to involve representatives of key interest groups in SIP policy development. At a minimum, they have sought informally to sound out parties likely to be affected by clean air strategies under consideration.

Some states and MPOs have gone considerably further, though, setting up quasi-official "steering committees" or "task forces" -- advisory groups that have brought a wide range of interest groups together, along with the core public agencies, to flesh out policy options and thrash out the tradeoffs necessary to satisfy CAAA/ISTEA requirements. Strategically, these agencies have sought to minimize conflict, mobilize support for consensus emission reduction policies, and secure early buy-in from potential critics.

As one official from the Texas Natural Resource Conservation Commission (TNRCC) put it, discussing that agency's extensive efforts to bring interest groups into the policy-making process, "We have worked very closely with them to keep them informed every step of the way as our programs have developed and as our regulations have evolved .... We have laid out the requirements under the Act, our proposals for how we would address those, and received their comments back. We have in fact been spending the majority of our time, throughout the development process for these SIP revisions, working in conjunction with these groups."

The same official continued, "We have done that partially from a selfish standpoint, because we realize that if we just develop something on our own and just put it out there, we are going to catch

a whole lot more flak and resistance than if we develop that consensus up front. That has, in fact, been the case. We have not gotten the flood of opposition or even comments to a lot of our proposals that we would have expected. In that way, it has expedited the process and helped us meet the [CAAA] deadlines."

In Massachusetts, a "SIP Steering Committee" convened by the Department of Environmental Protection (DEP) debated options for the 1993 SIP. This helped galvanize support among major business groups for an enhanced inspection and maintenance (I/M) program as an alternative to further regulation of stationary source emissions. Their support was crucial in ultimately securing legislative authorization for enhanced I/M, a top DEP priority.

An increasing number of states seem to see dividends in this approach to SIP development. In Georgia, the State Environmental Protection Division (EPD), in the Department of Natural Resources (DNR), developed its 1993 SIP submission essentially in-house. EPD included in the SIP an enhanced inspection and maintenance program with mandated separation of vehicle testing and repair facilities, with the expectation that Georgia service station owners, while not particularly pleased about losing their testing business, would nevertheless not protest too loudly. Eventually, however, the station owners mounted a "strenuous campaign" of opposition which led EPD to "back away" from its program "at the eleventh hour." In response, EPD set up a special I/M advisory committee to engage the station owners, together with environmentalists and State representatives, in fashioning a compromise solution.[18] Several months later, EPD approved a "hybrid" enhanced I/M program which does not mandate complete separation of testing and repair work.[19]

Some states have struggled with this approach, however. In Illinois, the State Environmental Protection Agency (IEPA) first made overtures about creating a broad SIP advisory group several years ago, but found insufficient interest. In conjunction with the Chicago Area Transportation Study (CATS), the Chicago MPO, IEPA did form an advisory panel to develop ideas for the federally mandated ECO program. The panel was unable to develop an approach that could achieve consensus support, and the ECO mandate aroused bitter opposition from leading business groups. (See further discussion of this issue below.)

Concerned by the rising level of political conflict over CAAA issues, IEPA is seeking to revive the strategy of interest group consultation and bargaining. Recently, the agency "announced a plan to encourage greater involvement by interest groups to help the state develop viable options to reduce ozone emissions." The forum will be a new "policy group, which will consist of state, industry, environmental and other special interest groups," with a number of subgroups. The state hopes "that by allowing the special interest groups to have more input in the decision-making process, they can avoid a bruising fight with the business community."[20]

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[18]"Georgia Halts Implementation of Enhanced I/M, Seeks Compromise Plan," *Clean Air Report*, April 7, 1994.

[19]"Georgia Opts for Hybrid Inspection and Maintenance Program," *Clean Air Report*, June 30, 1994.

[20]"Illinois Seeks Help from Interest Groups in Solving Nonattainment Problem," *Clean Air Report*, July 28, 1994.

5.4.2 Boundaries of Participation

To date, deliberations on transportation and air quality policy have been focused primarily at the *state*, not regional, level. This appears inconsistent with the intent of ISTEA, which foresees a very strong role for MPOs in transportation policy making; but it is not difficult to explain. Legal responsibility for preparing SIP submissions lies with the state; state agencies tend to have superior organizational capacity; and certain policies require State legislative approval. As a result, MPO staff generally have been secondary, but active, participants.

Another element of the explanation, though, lies in the fact, to be discussed in detail below, that SIP policies have had few implications for regional transportation infrastructure programming or for local transportation operations. The exceptions have been some change at the margin as a result of, first, allocating Congestion Mitigation and Air Quality (CMAQ) funds under ISTEA and, second, preliminary studies of possible transportation demand management policies.

However, the role of MPOs and the significance of air quality issues for their responsibilities -- is likely to grow during the next few years. In particular, conformity determinations under the final Federal regulations promulgated in November 1993 are now clearly prominently placed on the agendas of MPO decision makers.

Other participants whose involvement was expected in transportation and air quality policy making have typically not been major players. Local government has not been actively engaged except for the few local officials active in MPO affairs. Transit agencies have generally not been heavily involved except in seeking funds for projects with air quality improvement potential from the CMAQ program under ISTEA and in responding to CAAA regulations that directly affect their own operations, such as clean fuel fleets. Economic development and land use agencies have typically not been active, notwithstanding the hopes of many environmentalists that Federal air quality regulation would provide an impetus for changes in state and local government land use policy and regulation.

5.4.3 Mandates, Fair Shares, and Political Feasibility

The heart of the SIP planning process in each nonattainment area is the establishment of an "emission budget" that allocates permissible emissions among sectors -- e.g., stationary, area, and on- and off-road mobile sources -- and thereby establishes the parameters of pollution reductions necessary to attain national air quality standards.

Some observers expected states to assign *a priori* emission reduction goals by sector, permitting public agencies, private interests, and the concerned public within each sector to develop specific strategies for meeting these goals. Instead, the process has generally worked more incrementally and interactively.

The policy professionals have typically sought first to determine "what can we get" in emission reductions from measures specifically required by CAAA for nonattainment areas of its classification -- e.g., NO_X RACT (stationary source controls), employee commute option (ECO)

programs, and enhanced inspection and maintenance (I/M) programs. Then they have assembled a "menu" of additional options from all sectors to be roughly analyzed for pollution reduction potential, technical feasibility, public and private sector costs, and political acceptability.

In most states, the inner circle of policy professionals has then sought consensus for a particular SIP submission, usually through extensive multilateral and bilateral discussion and bargaining. It has searched for a set of technically feasible measures that achieve the federally required aggregate emission reductions, while minimizing economic costs to business and public entities and *visible* costs to ordinary citizens (in economic and behavioral terms), and while staying within the broad constraints of political acceptability and a perceived "fair share" allocation by sector (e.g., stationary and mobile sources). Development of consensus has tended to be driven by the widespread desire to avoid Federal sanctions (or the uncertainty and perceived potential damage to the region's business climate resulting from a *threat* of sanctions).

5.4.4 Consideration of TCMs

This decision process significantly affected the treatment of proposals for transportation control measures (TCMs) in the 15% VOC reduction SIPs due in November 1993.

The term "TCM" covers a wide range of transportation control strategies that can be roughly grouped in three categories: (1) Transportation System Management (TSM) includes policies that improve traffic flow -- for example, through better signal synchronization -- or otherwise make more efficient use of existing transportation networks. (2) "Mild" Transportation Demand Management (TDM) measures reduce single-occupant vehicle (SOV) travel by promoting or providing alternative means of transportation. This category includes investments in mass transit, construction of HOV highway lanes and bike paths, as well as *voluntary* carpooling, trip reduction, and telecommuting programs. (3) "Restrictive" TDM involves financial disincentives or regulatory constraints, including various transportation pricing controls, restrictions on parking, exclusion of SOVs from existing highway lanes, and *mandatory* trip reduction, carpooling, telecommuting, and land use regulations.

The first two categories -- TSM and "mild" TDM -- represent a more "conventional" approach to transportation control. To varying degrees, such measures have long been incorporated into state and metropolitan transportation plans. The third category represents a more innovative -- and in many cases largely untested approach.

TCMs generally did not hold up well in the 1993 SIP development process when subjected to quantitative and political analyses by the policy professionals. Sifting through a wide range of options for meeting milestone emission reduction requirements, they typically found that "conventional" TCMs as a class had only weak emission reduction potential. (There were differences within that class, though, between TSM and "mild" TDM. Despite the small emission reductions, TSM sometimes proved cost-effective relative to other pollution reduction strategies;

however, the "mild" TDM options usually rated poorly for cost-efficiency.[21]) By late 1993 transportation and air quality professionals, at least in our ten study areas, were highly skeptical of securing substantial emission reduction credits from "conventional" TCMs.

These results initially came as a surprise to many who had touted investments in mass transit and HOV facilities, for example, on the basis of their purported air quality benefits.[22] These advocates, including many in the environmental community, responded by pointing to the narrow focus of the analysis, urging that a wider range of social costs and especially benefits be considered in evaluating "mild" TDM, particularly public transportation.

Some of the "restrictive" TDM measures did fare well in analyses of emission reduction potential and cost efficiency. However, those which looked promising in these terms were almost always perceived as too politically controversial to be adopted. Measures such as congestion pricing, parking restrictions, and regional land use regulation have significant emission reduction potential because they aim to restrict personal transportation behavior and even lifestyle choices. It is for that same reason, however, that they are so politically unpalatable. They have the potential to rouse strong popular opposition and lack a strong supportive constituency.

In none of our ten study areas did "restrictive" TDM measures, other than the Employee Commute Options (ECO) program, get included in the 1993 SIPs. ECO was the lone exception -- despite the fact that it was projected to produce relatively little in the way of emission reductions, at significant cost -- because it was mandated by CAAA in "severe" nonattainment areas.[23] The political controversy that subsequently surrounded it in many jurisdictions -- discussed in more detail below -- shows that the concerns that shaped general attitudes toward "restrictive" TCMs were not unwarranted. In the absence of political leadership or a strong and specific Federal mandate, state and local policy professionals were loath to advocate other such measures and thereby risk what more than one of our informants called "political suicide."[24]

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[21]See Apogee Research/National Association of Regional Councils (NARC), *Costs and Effectiveness of Transportation Control Measures (TCMs): A Review and Analysis of the Literature*, January 1994; U.S. General Accounting Office, *Reducing Vehicle Emissions With Transportation Control Measures*, Report to Congress, August 1993; David L. Antonioli, "The Mass-Transit-Air Quality Link," (Taubman Center for Local Government, John F. Kennedy School of Government, Harvard University, May 1992), p. 22.

[22]See for example Philip Weinberg, "Public Transportation and Clean Air: Natural Allies," *Environmental Law* Vol. 21:1527 (1991), 1527-42.

[23]The Conservation Law Foundation has argued that employer trip reduction programs actually generate net economic benefits by cutting the costs associated with single-occupant automotive travel (e.g., costs due to accidents, productivity lost to congestion, vehicle insurance, maintenance, and operation costs). See New England Electric Systems and Conservation Law Foundation, with Jeffrey M. Zupan, Apogee Research, *A Clean Air Bargain: Cutting Back on Driving as a Way to Reduce Ozone Pollution*, December 1993. It should be noted, however, that this study does not challenge the finding that trip reduction programs result in only marginal reductions in emissions (in fact it confirms it).

[24]A telling illustration of the political volatility of "restrictive" TDM is the fact that DOTs and MPOs have been very slow to lay claim to the money allocated in ISTEA for congestion pricing demonstration projects. As of this writing, only the San Francisco Bay Area had applied for money (and received $25 million) from the demonstration program to actually implement a congestion pricing initiative, on the Bay Bridge. Recently, FHWA agreed to fund a "pre-project study" to be conducted by the Southern California Association of Governments. According to one

Other pollution control options looked preferable in the SIP policy selection process when compared with both "conventional" TCMs and "restrictive" TDM. Specific Federal mandates provided states with some political cover for the adoption of enhanced inspection and maintenance, "Stage II" fuel vapor recovery, "reformulated" gasoline, and NO_x RACT stationary source controls. More important, these measures promised to provide comparatively "big hits" of cost-efficient emission reduction, and, with the exception of enhanced I/M, did not threaten to rouse large-scale popular opposition. As a result, for the most part these measures were able to survive opposition from specific regulated interests.

Overall, TCMs typically accounted for only a small fraction of the emission reductions claimed toward the required 15% VOC reduction in the SIPs submitted in 1993 by our ten study areas. The adopted TCMs tended not to represent new commitments, instead simply recapitulating and taking some small credit for mass transit, HOV, or traffic signalization projects that DOTs and MPOs had already included in their plans and programs.[25] In short, TCMs as a rule were to be found only at or near the bottom of most decision makers' lists of pollution control options. As of 1993, the states had not yet exhausted their other, more effective and/or politically palatable options.

5.5 IMPACTS ON TRANSPORTATION PLANNING AND PROGRAMMING

What effects have CAAA and the air quality provisions of ISTEA had on state and metropolitan transportation planning processes and investment priorities? We have already noted much closer links between the previously disconnected air quality and transportation planning communities. It appears that air quality considerations have yet to force a major reorientation of planning priorities or redirection of Federal dollars, although our own data is sketchy on this point.

FHWA source, the agency expects to sign similar agreements soon with transportation agencies in San Diego and Washington State. By the end of the fiscal year, more than halfway through the six-year life of ISTEA, this source expects that $50 million, or one-third of the total $150 million allocated to the demonstration program, will have been allocated.

[25]In many of the nonattainment areas in our study, transportation plans and programs included additional TCMs beyond those identified in SIPs. There were two reasons for this. First, most of these TCMs were not expected to make a noticeable difference in regional emissions, especially within the 1996 time horizon of the 15% VOC reduction SIP. Second, transportation planners in many cases balked at the legal commitment to timely implementation involved in claiming SIP emission reduction credit. That commitment would impinge on their ability to administer their transportation program flexibly enough to react to financial, political, and even meteorological changes in local circumstances.

5.5.1 Making Use of Funding Flexibility

The creation of new transportation funding categories, and in particular the flexibility that they offered to transfer funds from one purpose to another, was frequently touted as one of ISTEA's greatest innovations. Some assumed that the new flexibility would release -- and facilitate the satisfaction of -- a pent-up demand for "alternative" transportation projects, projects that might have a positive impact on regional air quality. But over the first two years of ISTEA implementation that demand had for the most part not materialized, and flexibility had not brought about a substantial change in the distribution of projects in transportation plans and TIPs.[26]

One explanation often cited by our interview subjects was the fact that commitments to fund transportation projects are frequently effectively locked in years in advance, and that it would take several years for pre-ISTEA commitments to work themselves through the programming "pipeline." This means that project supporters had secured promises that money would be forthcoming; these individuals and groups would be disappointed if the commitments were not kept. A 1993 GAO report pointed in addition to the constraints imposed by state-level restrictions on the use of fuels tax revenues, by the persistence of "significant unmet investment needs for highway, bridge, and mass transit infrastructure," and by the lack of adequate quantitative tools for states and localities to assess the "modal tradeoffs" that inform decisions to "flex" funds or not.[27]

But another, frequently overlooked explanation was that flexibility in ISTEA was not entirely new after all. One of our informants explains:

> [Pre-ISTEA] highway categorical programs never were serious constraints on the projects that we've done in [this state]. They were accounting exercises. We moved the funds around from place to place to maximize the projects that we could get on a particular letting. The categorical restrictions never stopped us from doing what we thought needed to be done, and they most certainly didn't stop us from transferring funds to transit.

While this may sound like an extreme example of pre-ISTEA funding flexibility, the point is echoed by Neal Denno, who notes that "there was a great deal of ability before ISTEA to move funds from one program to another" and describes ISTEA's funding provisions as more an "incremental step" than a "revolution."[28]

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[26]See U.S. Government Accounting Office, *Transportation Infrastructure: Better Tools Needed for Making Decisions on Using ISTEA Funds Flexibly* (Washington, D.C. : U.S. GAO, October 1993), Report No. GAO/RCED-94-25; GAO, *Transportation Infrastructure: Urban Transportation Planning Can Better Assess Modal Tradeoffs* (Washington, D.C.: U.S. GAO, April 1992), Report No. GAO/RCED-92-112.

[27]U.S. GAO, *Transportation Infrastructure: Better Tools Needed for Making Decisions on Using ISTEA Funds Flexibly*, p. 10.

[28]Neal Denno, "ISTEA's Innovative Funding: Something Old, New, and Borrowed," *Transportation Quarterly*, Vol. 48, No. 3 (Summer 1994) 275-285.

5.5.2 CMAQ

The major exception to this characterization is the Congestion Mitigation and Air Quality (CMAQ) program. Unlike the other newly created funding categories, CMAQ had no pre-ISTEA antecedents. By explicitly and for the first time targeting funds for improvements in air quality, it challenged the transportation planning community to develop new project evaluation and funding allocation procedures.

The response to this challenge was uneven. At a minimum, the players, often organized into newly created "CMAQ Project Selection" committees or subcommittees at the MPO level, had little trouble adapting to the air quality constraint in the abstract. In the first round or two of CMAQ allocations, emission reduction potential was typically treated as a base criterion for access to CMAQ funds while leaving ample room to accommodate political "horse-trading" over agendas which for the most part pre-dated ISTEA and CAAA. Consequently, as of late 1993, CMAQ money had largely gone to fund projects which had long been either in the "pipeline" or on the wish lists of one or other transportation agency, and which reflected priorities other than air quality.[29] While the availability of CMAQ funds may have speeded up the programming of these projects, all of which had some emission reduction potential, the emission reduction potential of the CMAQ program as a whole was neither being used strategically nor being optimized.

Many of the ten nonattainment areas in our study made forthright efforts to nail down more precise and rigorous CMAQ project selection criteria. Those efforts tended to be drawn out well into 1993 by a series of behind-the-scenes debates over both highly technical and highly politicized issues -- for example, should absolute emission reduction potential weigh more heavily on project selection than relative cost-effectiveness? and what should be the standard methods for quantifying either of those criteria?[30]

These deliberations were further complicated by emerging scientific findings and revisions of EPA's mobile source emissions model (MOBILE). In late 1991, a National Research Council report focused attention on the complex interaction of VOCs and NO_X in ozone formation and called into question air pollution control strategies based mainly on VOC reductions.[31] Also in late 1991, EPA issued MOBILE version 4.1, which showed for the first time that NO_X emissions increased as highway speeds increased. MOBILE 5.0, issued in 1993, showed even greater

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[29]Our informants were nearly unanimous in making this overall assessment. There were of course exceptions to the rule, though, as at least some CMAQ funds were tapped for new projects in almost every nonattainment area in our study. New projects receiving CMAQ money ranged from bicycle facility expansion to alternative fuel fleet conversion and service mechanic training (in anticipation of the implementation of the enhanced I/M program).

[30]Pending the resolution of these and other issues (including in particular questions about NO_X emissions), one of the transportation agencies in our study, the Pennsylvania Department of Transportation (PennDOT), actually opted not to allocate some of its CMAQ funds at all.

[31]National Research Council, Committee on Tropospheric Ozone Formation and Measurement, *Rethinking the Ozone Problem in Urban and Regional Air Pollution* (Washington, DC: National Academy Press, 1991) especially Chapter 11.

increases in NO_X emissions as speeds increased. Together, these developments had broad implications for transportation planning under CAAA -- and for CMAQ.

CMAQ sets two funding priorities: "air quality" *and* "congestion mitigation." Congestion and emission reduction were believed to be highly compatible objectives at the time that ISTEA was enacted. By late 1993, however, the transportation community was confronted with modeling results and scientific opinion indicating that congestion mitigation measures might increase NO_X emissions, which, in turn, under certain conditions, could increase ozone formation. With this new perspective, the previously automatic presumption of correspondence between air quality and congestion relief goals was subject to more intense scrutiny.

Even if new criteria for CMAQ project selection were hammered out and applied, though, they could not take the horse-trading out of funding allocation. If the single criterion of air quality was applied, technical uncertainty still left room for political maneuvering. And more elaborate, multi-criteria schemes could only serve as rough guides for the tradeoffs inherent in programming decisions.

More important in the end, relatively little money was at stake. If CMAQ was, as Denno calls it, "the only truly innovative funding program to be found in ISTEA," it was also one of the smallest, authorized at $6 billion over the six-year life of the Act. It is difficult to assess the potential impact of $6 billion dollars of transportation investment on air quality in the nation's polluted metropolitan areas. However, several of our informants described CMAQ as no more than a drop in the proverbial bucket.[32]

5.5.3 Participation and Priority Setting

ISTEA called for a significant expansion of the range of participants in the transportation planning process. This meant more than simply bringing environmental agencies "to the table."

Our data does not enable us to assess fully the substance of this innovation, in part because the final regulation which directs its implementation, the statewide and Metropolitan Planning Rule, was not issued by U.S. DOT until late in 1993, after much of our interviewing was completed. We have found some evidence, however, that (1) pending the issuance of that rule most areas had taken only tentative steps toward broadening their public outreach efforts,[33] and (2) some organized interests, and in particular environmentally-oriented advocacy groups, have been gaining access to the

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[32]One of our informants observed that less than full authorization of ISTEA has further diluted the potential impact of the CMAQ program. As he explained, under ISTEA states can shift money from one program to another provided they do not exceed their authorization ceilings for any given program. Under conditions of less than full Congressional authorization of ISTEA, the smaller programs like CMAQ tend to suffer disproportionately as states shift funds to reach their authorization ceiling in the bigger programs.

[33]One exception was the "Atlanta Region Transportation Public Involvement Plan," an outreach plan published by the Atlanta Regional Commission (ARC) in October 1993 and calling for the cultivation of citizen networks on two levels -- a "transportation resource bank" and "a family of partners" -- to support and inform regional transportation planning.

transportation planning and programming process under ISTEA, though only slowly and in limited forums.

CMAQ has provided "new" interest groups with a small measure of access to and influence on programming decisions. In some cases, private organizations have directly and successfully submitted their own CMAQ project proposals.[34] In many nonattainment areas, bicycle advocates have successfully lobbied for new expenditures of CMAQ money on bicycle networks and facilities. Moreover, as described in more detail below, environmental groups have pressed for influence in setting the technical planning and modeling criteria for CMAQ project selection and for transportation planning under CAAA more generally.

"TCM Task Forces" -- linked to both the SIP development and transportation planning processes -- have sprung up in many of the areas in our study. Conforming to the SIP "steering committee" model, these task forces have brought together in an advisory capacity the core transportation and air quality agencies along with a wide range of interest groups to air out TCM options and assess their technical and political feasibility.

But their function, at least as of late 1993, was more symbolic than practical. Insofar as they assembled a broad spectrum of participants, many of them new to the transportation planning arena, to consider a set of air-quality-driven policies, these forums were an embodiment of the "spirit" of ISTEA. At a minimum, they served the political function of demonstrating that the transportation community was making some effort to respond to CAAA, while laying the groundwork for possible future implementation of some of the less conventional policy options. As we have seen, however, the Task Forces' discussions and debates in 1993 did not translate into planning and programming commitments. Instead, the TCMs that appeared in TIPs and SIPs at that time largely, but with some exceptions noted above, reflected pre-CAAA and pre-ISTEA priorities and agendas.

It was one thing to set up advisory TCM Task Forces or separate CMAQ funding allocation committees as appendages to the transportation planning process. But it was another thing to integrate the air quality constraint into the heart of that process. The resistance to change of that sort had both "practical" and political dimensions.

On the practical side, transportation agencies were simply not sure how to filter transportation plans and programs through an air quality screen in a timely fashion. One of our informants summed up these concerns, describing the CMAQ funding allocation process as "extremely cumbersome.... If we programmed the rest of our projects that way, we'd never have a highway program in [this state]."

Politically, some transportation policy makers had an interest in postponing the moment when air quality considerations and their proponents might come into conflict with established transportation

[34]In Philadelphia, for example, a local environmental group won CMAQ money to run a public education campaign. In Chicago, a suburban Transportation Management Association (TMA) won CMAQ money to run a pilot telecommuting program.

priorities and constituencies. Such conflict on the programming level would be a zero-sum game, with political costs attached to any solution.

The following statement by one of our informants is illustrative: "You can't just say that STP is new money. It's not new money; they're just collapsing a bunch of old Federal categories and calling it STP now. Who's going to pay for...improvements in those municipalities if you can't use the STP for that? The real decision here is not to take a pot of fake money and spend it on new transit projects; the real decision is if you're going to spend it on transit, you're going to give up something on the highway side. People ought to recognize that that's the choice that needs to be made."

Or, as another source noted, "The problem facing us and our MPO next year is if we need a TCM package to make the SIP work, it will cost us about $200 million for about 6 tons of TCMs. If we are going to spend those $200 million on TCMs, we are going to have to take them away from other projects -- meaning big changes in our existing transportation plans."

Given these concerns, and in the absence of a strong popular mandate, there was a real reluctance among transportation "policy professionals" to challenge the status quo.

5.5.4 Interim Conformity

The conformity requirement of CAAA had been designed to do just that. But U.S. EPA did not issue final conformity regulations until November of 1993, two years after the deadline established by the Act. In the meantime, transportation plans and TIPs were subject to "interim" conformity guidelines, issued in June 1991. The interim conformity test was a comparison of projected emissions of VOCs and CO at a number of future "milestone" dates under two scenarios: implementation of all (the "build" scenario) or none (the "no-build" scenario) of the projects in the plan or TIP in question.[35]

This procedure seems to have had little "bite." First, the nature of internal combustion engine technology is such that VOC emissions decrease as speeds increase (though the rate of decrease in emissions slows as speeds rise). In many regions, plans and TIPs were already stocked with traffic flow improvements and other "system management" measures that promised to increase speeds and thus helped those plans and TIPs pass the test.

More significantly, modeling frequently projected that increases in highway and arterial capacity would result in increases in vehicle speeds and therefore in decreases in VOC emissions. Many environmentalists strongly disputed the logic of these projections, noting in particular that travel demand models tended not to take sufficient account of the additional demand that would be "induced" by increases in roadway capacity and that, they argued, would over time push congestion levels up (and vehicle speeds down) to at least the same level as before the capacity increase.

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[35]There was actually another piece to the interim conformity test: an examination of plans and TIPs to ensure that programmed TCMs were being implemented with all due speed.

Indeed, the State of Transportation and Air Quality Modeling more generally made it difficult to predict the emission impact of various projects and policies. Not only did the models fail to account for the feedback effects of improved traffic flow on future travel demand, they lacked sufficient geographic specificity to capture the impact of the many local projects in the typical metropolitan transportation plan. Many interim conformity analyses showed that the difference between the "build" and "no build" scenarios was quite small -- and within the collective margin of error of the analytic techniques serially applied.

The relative ease with which most jurisdictions met the interim conformity test may have encouraged an impression in some parts of the transportation community that conformity was a mere technical exercise to be carried out by staff on the back end of the planning process -- as opposed to a key process in transportation planning that would inform and shape project selection. It certainly postponed the far more difficult clash between air quality and other transportation goals that the final conformity rule now precipitating.[36]

5.6 TECHNICAL PLANNING -- CHARACTER AND CONSEQUENCES

CAAA creates a highly technical and time-consuming technical planning process, which requires inventorying the scope of area air quality problems, devising and scoping out options for mitigating these effects, modeling and analyzing the impacts of the options, considering potential tradeoffs, and developing recommendations for action. Under CAAA, this work -- carried out by technical staff working under the oversight of the policy professionals described above -- is a necessary prerequisite of determining the policies reflected in the SIP. Now that the interim conformity procedures have been replaced by the final rule, that type of technical planning will characterize the air quality component of transportation planning as well. However, the technical character of this planning also serves to limit the accessibility of the policy process to the broader political community and the public.

5.6.1 The Political Functions of Technical Planning

The existence of strong technical planning requirements in CAAA reflects a calculated strategy by environmentalists during Congressional debate. Advocates of strong Federal regulation were willing to have new, stretched-out deadlines set for CAAA compliance -- and to permit more severely polluted areas to have substantially longer periods to comply -- to make it politically and substantively feasible to achieve national air quality goals. They were well aware that the tight deadlines in earlier versions of CAAA, while a symbolic victory, had engendered at the state and local level non-cooperation, resistance, and efforts to repeal significant provisions of the law. And, ultimately, the Federal Government backed away from serious efforts to enforce these deadlines.

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[36]The final conformity regulation is a more difficult test for at least two reasons. First, it requires a NO_x build/no build test, as well as a VOC build/no build test -- which, in some circumstances, makes congestion mitigation problematic from an air quality standpoint. Second, it ultimately requires showing that emissions under the "build" scenario are not only less than under the "no build" scenario but also "conform" to the phased reduction goals embodied in the area's SIP submissions.

In return for accepting more realistic deadlines for attainment, however, environmental advocates wanted a process that would (1) chart a clear path, with required stepping stones designed to achieve national air quality standards within the new statutory time frames; (2) establish firm performance standards at fixed, temporal "milestones," with penalties for failure to meet them, so that states could not delay serious pollution abatement efforts until final deadlines approached; (3) measure performance in unambiguous, quantitative terms so that state compliance could not be "fudged"; and (4) use the "numbers" to put pressure on various interests to agree to tough emission-reduction measures.

This strategy was thus a way of obviating two dilemmas. First, nonattainment areas varied enormously in the factors that shaped air quality conditions -- for example, land use and economic activity patterns, transportation systems, topography, meteorology. It was therefore extremely difficult to prescribe national rules for dealing with these areas' highly idiosyncratic pollution problems. Second, substantial variation in the incidence and balance of economic and social interests in nonattainment areas made it unlikely that a single national approach would be politically viable in all.

Under the procedures of the new CAAA, therefore, states would be held to a specific time schedule, varying by the severity of their pollution problem, for reducing pollution to the quantitative thresholds of the national air quality standards. They would be given substantial latitude in developing State Implementation Plans (SIPs); only a few specific policy measures were required. But the technical planning requirements and the concept of an "emission budget" would effectively *force* states to face the political tradeoffs among alternative policies by establishing a zero-sum pollution-reduction game. And clear interim checkpoints were established -- for example, a plan for 15% VOC reductions by 1996; a requirement for 3 percent reasonable-further-progress reductions each year afterwards, measured tri-annually; a plan in 1994 demonstrating attainment by the area's specific deadline; and actual air quality monitoring tests beginning in 1996 to confirm whether improvements had, in fact, been achieved.

The states would have substantial stakes in fulfilling these requirements. Failure to meet the various quantitative performance standards and interim milestones of CAAA exposed a jurisdiction to one or more sanctions or penalties -- for example, automatic Federal sanctions (either a highway funding cutoff or a "2-for-1" emission-reduction requirement for new stationary sources), the lapsing of transportation plans or programs resulting in the suspension of Federal project funding, or a "bump up" in CAAA classification (for example, from "serious" to "severe") resulting in more onerous regulatory requirements. Even if the Federal Government did not impose these penalties, a jurisdiction might become vulnerable to suit by environmentalists.

5.6.2 Technical Limitations

The architects of the statute, however, assumed (or wished for) a state-of-the-art of technical planning that in reality exceeded both the limits of professional knowledge, at least on some fronts, and, by a substantial margin, the boundaries of professional practice in many jurisdictions.

Problems exist in both the transportation models and in the emission and air dispersion models. Therefore, rather than producing precise estimates of current and future pollution levels which could be readily compared to the permissible thresholds at each milestone of the pollution reduction process, the technical planning process is fraught with imprecision and uncertainty, stemming from several sources.

First, the basic "data" used to calibrate the behavioral assumptions of the models or as inputs is frequently outdated, incomplete, or inaccurate. Transportation planning agencies in most areas have had neither sufficient resources nor the motivation in recent decades to make a priority of collecting and verifying information about transportation users and their travel behavior.[37] Second, the models themselves often grossly simplify reality -- either to produce estimates/forecasts that are economical in terms of data needs, staff skills and time, and data processing costs; or because of inadequate understanding of the underlying behavioral relationships. The results may or may not permit sensible policy judgments, depending on the purposes for which the data is employed. Forecasts of regional travel demand, for example, may be useful for some purposes but inadequate to determine the impact of local infrastructure proposals on air quality. Third, the transportation and air quality modeling process involves linking together several models, each with its own shortcomings, so that the imprecise or uncertain outputs of one become less-than-satisfactory inputs for another, and so on. Furthermore, at the time of CAAA/ISTEA enactment, only a few jurisdictions were on the "cutting edge" of professional practice in transportation and air quality modeling; and the process of improvement, especially at the same time that complex planning products must be produced, is arduous and slow.

For example, estimates of auto emissions in a given nonattainment area are needed to (1) prepare the 1990 baseline emission inventory, (2) simulate the future effects of various pollution reduction policies as part of the preparation of the 1993 15% VOC reduction SIP, and (3) perform analyses under the conformity regulation to determine the impacts of planned infrastructure projects. These emission estimates are usually developed by the State Air Quality Agency from EPA's MOBILE model or California's EMFAC model, using inputs from the regional travel demand model typically maintained by the MPO or State Transportation Agency. But the travel demand models generally in use cannot produce the detailed information about travel patterns on specific links of the road system -- broken down by vehicle type, time of day, and vehicle speeds -- that the emissions models require; and the emission models are not capable of dealing with variations in pollution caused by autos operating in different phases of the drive cycle. As a result, note two careful students of the subject, the analytic process requires "numerous assumptions and extensive post-processing."[38]

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[37]Until CAAA and ISTEA, federal funds and technical support for such activity had been greatly reduced in comparison to what was available before the 1980s; and there were no regulatory mandates for states and MPOs to undertake improvements on their own. A few areas were exceptions to this trend -- notably Portland, Oregon, and the San Francisco Bay area.

[38]Harvey and Deakin, p. 4-6.

This is not a blanket indictment of the utility of simulation modeling. In general, the models widely in use in most jurisdictions were designed and appropriate for limited purposes -- mainly to provide rough approximations of reality for planning purposes. While "directional" data may be perfectly adequate for assessing facility needs or comparing alternative options for infrastructure investments, however, it does not constitute the ideal data for "threshold" regulatory tests.

The models are not the only sources of imprecision and uncertainty in the technical planning process. The methodological guidance developed by Federal agencies to determine how much emission-reduction "credit" a jurisdiction can claim for particular policy measures is subject to its own imprecision -- especially as it is adapted to accommodate inter-jurisdictional variations in policy design.

Yet another source of uncertainty in technical planning is how the results of these estimation and forecasting exercises jibe with the air quality monitoring data that is collected periodically in numerous locations in each nonattainment area. Starting in 1996 (for "moderate" and above nonattainment areas), it is actual monitoring data -- subject to its own limitations and sources of imprecision as an indicator of a region's air quality -- that will determine whether an area has met its checkpoint goals and eventually "attained" the national standards.

5.6.3 Varying Perspectives

Different participants in the transportation and clean air policy process have varying "takes" on the "numbers game" of technical planning and contrasting attitudes toward its imprecision and uncertainty.

The career officials in air quality agencies -- and frequently appointed policy makers as well -- are typically sympathetic toward Federal requirements, the arguments of advocacy groups, and pro-environmental public opinion; but they are also subject to other political pressures. They must face regulated interests who point out the costs of compliance. Moreover, because they are subject to the governor's administrative oversight, they must be aware of his/her political interests, which include the pressures of the regulated community. And they must be concerned with getting enabling legislation and budgets through the State legislature and averting hostile bills.

In sum, environmental officials are subject to strong countervailing political pressures and must constantly justify the regulatory restrictions they impose or administer. Consequently, air quality agencies tend to see the technical planning process as an "objective" (and, pertinently, politically convincing) way of determining how much pollution reduction is necessary and what effects specific policies would have.

State transportation officials are far more likely to argue that the models are being used for purposes for which they were not developed and are inadequate. They typically assert that restrictions on infrastructure investments or vehicle use should not be imposed if there is uncertainty about the modeling results.

In some cases, however, they will tout transportation projects on the basis of putative air quality benefits -- for example, transit initiatives or traffic flow improvements. But they are hampered, first, by limitations of the modeling tools, which in fact may not be geographically refined enough to demonstrate the effects of such projects; and, second, by the poor modeling results that some favored projects produce. For example, the emission reductions from transit service expansions are often small in magnitude and low in cost-effectiveness relative to other options. And, if traffic flow improvements promise to increase speeds above approximately 25 miles-per-hour, they sometimes become vulnerable to modeling results that show increases in oxides of nitrogen (NO_x).

Some state and local environmental advocates share the perspective of their federal-level compatriots who sought the incorporation of technical planning requirements in CAAA and ISTEA. They see the planning process as an effective way of "holding feet to the fire"; pressing actors and interests they don't trust to meet "objective," quantitative performance standards; and providing a handle for litigation, if necessary. Where modeling results are seen as uncertain, these environmentalists are quite likely to argue that a *margin of safety* should be built into policy choice so as not to jeopardize achieving national air quality standards on schedule.

But technical planning appeals to some environmental advocates more than others. Some groups have staff with quantitative modeling experience or can obtain backing from national affiliates or allies with such resources. A few are even gaining the capacity to "mount" the transportation or air quality models on their own computers and produce analyses that compete with the public agencies'. But other environmental groups, totally outgunned by the agencies' analytic capacity, are suspicious of their results. And some advocates, not at all analytically inclined, stay attached to favored policy positions -- for example, transit enhancements or transportation control measures -- whether or not they are supported by the "numbers."

5.6.4 What Disciplines the Process?

Given the high stakes of the regulatory process, its technical complexity, and the imprecision and uncertainty inherent in the exercise, one might assume at least a considerable "stretching" (and perhaps significant "cooking") of the planning results to minimize the need for painful policy choices to reduce pollution. Such suspicions animate some observers in the Federal Government and the environmental community.

Some sort of "shading" of planning results may well be occurring -- perhaps in many jurisdictions. It would be foolish not to expect State and regional planners to take policy advantage of imprecision and uncertainty at the margins; and aggressive testing of the "rules" is a normal part of any regulatory process. Nonetheless, we can point to a number of factors that appear to inhibit such behavior. On balance, we consider it unlikely that, except for a few hypothetical exceptions, the technical planning process has been severely distorted.

The first factor disciplining the technical planning process is federally sponsored standardization of analytic methods. Some important planning tools are developed, maintained, and periodically

updated by Federal agencies -- or officially sanctioned by them. These include, prominently, the mobile-source emission models -- EPA's MOBILE model series and California's EMFAC model -- and the EPA-commissioned photochemical dispersion model of the eastern seaboard's ozone transport region that provides state-boundary estimates of pollutants for the states' own modeling efforts. Also included are Federal guidance or regulations about how to calculate pollution-reduction credits for certain policy measures. The transportation conformity regulation is yet another example of Federal standardization of planning procedures.

While Federal standardization helps insure the integrity, comparability, and legal defensibility of planning results -- and policy choices based upon them -- it also holds the process hostage to the timing of Federal guidance. If important Federal guidance is seriously delayed, as was the conformity rule, the process of technical planning may grind to a halt across the nation. Once Federal intent to issue rules is known, only a few entrepreneurial professional staffers are likely to hazard the development of their own procedures for fear that these would ultimately be rejected by Federal overseers or subject to litigation. If they do adopt their own rules or adapt Federal guidance, they must be prepared to defend them to EPA or DOT and/or in court.

Nonetheless, there are clearly "gray" areas. In Chicago, for example, conformity analyses prepared for transportation plans used smaller VMT growth projections than did the SIPs for these areas. Lower growth rates made the conformity test easier to pass because fewer VMT would result in less emissions. The discrepancy, however, is not necessarily the simple result of "gaming" or dishonest manipulation of data.

The growth rates in the SIP were arrived at according to EPA guidance that prescribed an extrapolation procedure using Highway Performance Monitoring System (HPMS) data. The Chicago Area Transportation Study (CATS), the MPO, argued that it developed the VMT growth projection used for conformity purposes on the basis of a more sophisticated modeling of future regional transportation trends. Which forecast should govern decision making? CATS's advocacy of a "better" method cannot be lightly dismissed since the stakes are high in terms of what kinds of emission reduction measures will be necessary and/or what kinds of infrastructure development will be permissible. If nothing else, this example reveals that the division of institutional responsibilities for different CAAA requirements multiplies the complexities and ambiguities of technical planning.

As a second factor disciplining the process, Federal agencies have applied pressure for continued enhancement of State and regional agencies' technical capacity. While EPA has focused on improvements to air quality and emission models and FHWA on transportation models, they have consulted closely and critiqued each other's efforts. Recognizing the wide variation in the technical capacity "baseline" in each State or regional agency, the Federal agencies have not established minimum standards for technical analysis at each SIP or conformity determination "check point" but have pushed for ongoing efforts to improve future capacity. EPA and FHWA have insisted on a trajectory of technical improvement.

Third, Federal agencies review -- and can reject -- major state or regional planning products. SIP submissions are reviewed for completeness and approvability by EPA. That review has been very slow to date, and, with the partial exception of I/M plans, has not been exacting. Review of the 1993 15% VOC-reduction SIPs, which has not yet been completed, will tell a good deal more about Federal oversight of CAAA products. For its part, DOT has an affirmative responsibility to review MPO and state conformity determinations -- now under the final Federal rule promulgated by EPA, not the interim guidance in effect through 1993. (EPA will participate in this review in an advisory capacity.) It is difficult to predict whether this review will deter strategic "shading" in planning documents. It was such a Federal review process, however, that identified the discrepancies between VMT projections in the Chicago SIP and CATS's conformity analysis.

Federal standard setting and review are not the only source of discipline for technical planning. Public agencies have come to expect their results to be scrutinized by other participants in the process. The environmentalists have been most aggressive in this regard. Early in the implementation of CAAA and ISTEA, a coalition of national advocacy groups, including the Environmental Defense Fund (EDF) and the Natural Resources Defense Council (NRDC), sent letters to all MPOs and state transportation agencies in nonattainment areas. They asked for voluminous information about existing planning processes and made clear their intent to review, critique, and, if necessary, litigate to assure that planning under CAAA and ISTEA was done properly. At about this time, they actually threatened to sue agencies in New York, New Jersey, and Connecticut over regional transportation planning methods -- a dispute that was subsequently resolved without litigation.

These groups, and EDF in particular, have proselytized extensively at various transportation professional conferences for changes in modeling and planning practices. In the past few years, moreover, specialists affiliated with these national groups, usually acting in partnership with local allies, have made visits to a number of major MPOs to review and critique their current transportation planning practices. In Chicago, CATS was asked for extensive documentation of its transportation models and the underlying assumptions on which they are built. There and in a few other places, environmental groups intend to replicate these models on their own computers, ultimately conducting policy analyses competitive with the agencies' own. While these efforts have been concentrated on the more severely affected nonattainment areas, transportation planners elsewhere have been exposed to the substance of the environmentalist critique of existing methods and put on notice that their own efforts may be scrutinized.

Other interest groups have not sought systematically to influence technical planning procedures, but they have done so in some places on particular issues. Most notably, business groups in several areas, including Chicago and Philadelphia, have challenged the procedures for documenting mandated reductions in single-passenger vehicles under the ECO program. Public officials are well aware that many such groups, if riled, have the financial resources to obtain their own experts to counter agency findings or assist in litigation.

Finally, the core public agencies (state DOTs, air quality agencies, and MPOs) -- acting through interagency technical committees as well as informal contacts -- also keep each other in check by reciprocally scrutinizing planning procedures.

None of these factors assures that technical planning is done capably and with integrity. They may, in fact, spur contentious disputes over technical planning documents. However, the combined effect of standardization of methodology, improved technical capacity, and external reviews -- in anticipation and in actuality -- seems likely to prevent gross abuses in most jurisdictions.

5.6.5 Consequences of Technical Planning

The "numbers game" of technical planning has several important implications for the character of transportation and clean air planning.

First, it frames the policy process by identifying choices and helping to assess alternatives. This discipline is most powerful for the policy professionals who comprise the "inner circle" of planning; but it is compelling even for most elected officials, who recognize that technical planning procedures influence Federal regulatory oversight and affect the odds of court intervention in state and local decision making.

Second, it consumes scarce time in a regulatory process severely constrained by statutory deadlines. In most jurisdictions, technical planning has been completed only shortly before the statutory deadlines for specific SIP submittals, leaving very little time for the policy professionals to transmit, interpret, and discuss the results with anyone else. Thus the strenuous demands of mandatory technical planning tasks, on one hand, and tight CAAA deadlines, on the other, severely squeeze the time available for elected officials, high level appointed policy makers, and those interest groups lacking staff dedicated to these issues to educate themselves and participate in policy making.

It is certainly possible that this "squeeze" has been created artificially to keep the policy formation process tightly within the control of the inner circle of participants. Although we have not heard such complaints from our sources, our research cannot disconfirm this hypothesis. But it is likely to be true only to a limited degree. The multiple phases of technical planning are genuinely time-consuming even for experienced technicians and analysts; and many jurisdictions have been climbing a steep "learning curve."

Third, as a result of the complexity and delays involved in technical planning, the "big picture" of clean air planning -- the scope of the regional problem, the pollution abatement options available, and the nature of the tradeoffs required to comply with CAAA -- remains arcane, inaccessible, and largely invisible to many elected officials, agencies and interest groups outside the inner circle, and the public.

6. SECURING PUBLIC CONSENT

These patterns of participation and policy making have important implications for the crucial questions of CAAA implementation. Will elected officials provide necessary institutional approvals -- and will the public ultimately accept -- policies necessary for compliance?

To a substantial degree, implementation of earlier versions of CAAA foundered because of failure to secure public consent for the pollution control measures necessary to achieve national air quality standards. When U.S. EPA pressed for strong transportation controls under the 1970 act, the Federal regulatory mandate was overwhelmingly rejected by elected executives and legislators. They responded both to actual constituent and interest group opposition and to their instinctive expectations that protest would grow and hold them accountable if they backed policies needed to comply with Federal law. Under the 1977 CAAA, EPA generally avoided such confrontations, except in demanding adoption of inspection and maintenance (I/M) programs. Then in crafting the 1990 CAAA and reinforcing it with ISTEA, Congress sought to reduce the likelihood that political opposition would doom its renewed effort to reduce mobile source pollution.

The state and regional activities described above have kept implementation essentially on track well into the fourth year following enactment of CAAA. To date, the clean air policy process in most regions, while hardly invisible, has generated far less public controversy than many observers anticipated. Why has this been true? In most states, first of all, the formal procedures for adopting SIP submissions do not require extensive public involvement. Moreover, with exceptions to be discussed below, the policies adopted so far by most states have required citizens to make few behavioral changes and imposed few direct costs on them; as a result, they have typically not attracted widespread attention. The political firestorms that greeted EPA's transportation control plans in the 1970s have not so far been replicated.

As a result, however, these efforts have neither extensively involved elected officials nor, to any great degree, engaged public attention. Those who have dominated implementation, primarily the policy professionals in the core public agencies and major interest groups, have so far done very little proactive outreach to educate the public and its elected representatives and build support for clean air measures.

The lack of participation and "buy in" by a wider set of interests and an informed public may have serious implications for the long-term success of the Federal strategy embodied in CAAA. The low visibility of transportation and air quality policies leaves them highly vulnerable to volatile public reactions, the activation of opposing interest groups, and opposition from elected officials -- as evidenced to some degree already in reactions to the ECO and I/M programs.

6.1 POLITICAL SUPPORT AND INSTITUTIONAL APPROVALS

The process of securing formal institutional approvals for SIP submissions does not necessarily entail building strong support coalitions. In many states, SIPs are developed entirely within the executive branch, subject only to each state's own legal procedures for adopting administrative regulations. Usually that requires vetting by the governor or his/her appointees, plus some form of public hearing -- and therefore presumably some test of political viability, if not a demonstration of support. But because SIPs involve a Federal mandate backed by powerful sanctions, governors have often been willing to overlook opposition, even while typically establishing some distance between themselves and the controversial provisions of the plan.

In a minority of states, including Pennsylvania and Illinois, the procedures for adopting administrative regulations are more complex, involving various oversight bodies or special commissions. In some cases, the legislature has a role in approving administrative regulations. In these states, the proposed regulations may have more political visibility; and opponents usually have one or more additional procedural forums to block controversial measures. In such states, the need for policy proponents to build political support tends to increase.

This need ratchets up to yet higher levels when legislatures get more deeply involved. Only in a few cases have legislatures or key committees sought to participate extensively in SIP policy making, notably in Arizona where experience since the mid-1980s with a court-ordered Federal implementation plan had sensitized the legislature to clean air and transportation issues. At the SIP adoption phase, legislative involvement occurs more typically when enabling laws are necessary for certain required programs -- for example, ECO or enhanced I/M. (EPA requires a timely demonstration that appropriate legal authority is in place before it will approve a state implementation plan; but it has permitted SIP submissions with a "commitment" to provide evidence of necessary legal authority later.[39]) Legislative involvement is more likely, however, when appropriations are necessary to operate regulatory programs. And individual legislators or committees may seek political credit by playing an "ombuds" role for aggrieved interests, aggressively calling attention to some element of the state's plan. Thus, much legislative involvement typically comes only after the state's administrative agencies have gotten far down the road of SIP development.

In many states, therefore, SIP developers can operate outside the scrutiny of elected officials for a considerable period. Consequently, they may feel relatively little immediate pressure to build support coalitions that can withstand attack in more visible policy-making forums.

[39]A recent federal court decision has curtailed EPA's capacity to permit such "committal SIPs."

6.2 PUBLIC INVOLVEMENT AND OUTREACH

In response to this low visibility, the government and private groups involved in CAAA planning at the state and regional levels have done very little proactive public outreach or education. There are only a few exceptions. In the Philadelphia area, for example, the Delaware Valley Clean Air Council has recently launched a campaign to promote ECO policies.

The lack of outreach and education efforts is explained by several factors. First, while CAAA in principle requires opportunities for public *participation* in policy making, it provides neither a strong public mandate nor funds for public *education*. Second, the technical complexity of transportation and air quality policy makes it inherently difficult to explain through the mass media. Moreover, few involved in the process feel that they know how to get the public's attention, what an effective information dissemination "technology" would be, and what they should communicate. While some concerned officials and activists see potential analogies in campaigns to encourage recycling or discourage smoking, none seems to have developed a potentially effective public relations strategy to promote voluntary changes in transportation behavior or support congestion pricing and restrictions on vehicle use. The Federal Government and national interest groups have made some recent efforts to fill this gap, but these steps have not been adequate given the scale of the problem.

Finally, promoting widespread discussion and participation is not necessarily in the interests of the policy professionals in the core public agencies and private organizations. Some government officials fear a loss of the flexibility needed to manage interest group bargaining over policy. Moreover, these officials fear that if public information efforts activate quiescent interests and engender new demands or conflict, they will find themselves in difficulty with their superiors. Business groups, for their part, are wary of being publicly scapegoated for pollution problems. Rather than trying to rally public opinion, they usually prefer low visibility policy making forums, such as the "clean air task forces" described above, or directly lobbying agency officials and legislators. Environmental advocates cite broad public support for clean air; but they recognize that attentive citizens may, in fact, oppose some of the specific measures the environmental movement favors to achieve its goals. They, too, often feel strongest participating in task forces in which their willingness and capacity to litigate gives them bargaining leverage.

6.3 POTENTIAL POLITICAL VULNERABILITY

A policy-making process primarily involving an inner circle of agencies and interest groups facilitates exploration of technical options, preliminary assessment of political acceptability, and compromise and consensus building on emission reduction policies. But as noted above, the lack of public participation and "buy in" may leave transportation and air quality policies highly vulnerable to volatile public reactions, the activation of opposing interest groups, and opposition from elected officials. This effect has already appeared in some jurisdictions in reaction to the

employee commute option (ECO) program and enhanced inspection and maintenance (I/M) requirements.

6.3.1 ECO

Opposition to ECO, mandated in "severe" and above nonattainment areas, has been widespread because its requirements are seen as very onerous, especially by groups like retail merchants who have not been previously subject to CAAA regulation. Vehement opposition to ECO was initially spearheaded in Chicago by the Illinois Retail Merchants Association, which lined up other business groups to support its position. In the Philadelphia area, the Penjerdel business group lobbied aggressively against the program at each step of Pennsylvania's complex regulatory adoption process. Even in Houston, where the business community initially backed the program, business opposition to implementation has recently emerged.

Opponents in individual states have sought to defeat or sharply weaken ECO enabling statutes in state legislatures, insisted on ECO program designs at variance with EPA program guidance, and sought Congressional support to eliminate the CAAA requirement, make it voluntary, or permit it to be imposed episodically in the event of forecasted ozone exceedances. In both Chicago and Philadelphia, opposition to ECO has also led to calls for reclassifying of the area's ozone nonattainment status to "serious," which would exempt them from the ECO requirement.

State legislators have frequently been very receptive to ECO opponents, but governors have hesitated to oppose the program outright because of concern about CAAA sanctions. In Maryland, Governor William Schaefer felt ECO unfairly punished his home city of Baltimore because the regulations did not also apply to Washington, DC, but he authorized the program. In Illinois, however, Governor James Edgar, who originally backed an ECO statute in the legislature, eventually threw his weight behind the ECO opposition.

Nationally, ECO foes have begun to communicate and cooperate. Facilitated by the Urban Mobility Corporation, a consulting firm, business groups from Chicago, Philadelphia, Baltimore, and Houston, together with the National Conference of State Legislatures, have formed a coalition to lobby for episodic controls instead of the permanent restrictions mandated by EPA guidance.

In the face of this opposition, EPA, which had threatened sanctions for noncompliance, has softened its interpretation of the ECO requirement. Administrator Carol Browner has shown new flexibility in interpreting the statutory mandate, indicating that seasonal (but not episodic) controls may be acceptable to the agency; that employers will be held accountable for carrying out their planned program commitments, not for achieving numerical targets; and that the Clinton Administration's "parking cash-out" proposal could be a large part of an acceptable employer program.

6.3.2 I/M

Enhanced I/M, required in "serious" and above nonattainment areas, has also evoked fierce political resistance in some states, notwithstanding the conviction of EPA and most state and regional policy professionals that it is the most potent and cost-effective mobile source emission reduction measure available. Commitments to implement I/M were a central part of the strategy adopted by nearly all of these areas to fulfill the requirements of the 1993 15% VOC-reduction SIP.

But EPA's regulations for enhanced I/M require a "test" only program rather than the combined "test-and-repair" programs that have typically been run under the older "basic" I/M program. In many states, therefore, the auto repair industry, which sees enhanced I/M as a threat to a significant market and to customer relations, has placed great pressure on governors and legislatures to resist EPA's requirements. Elected officials, for their part, have been concerned that many citizens will resent the inconvenience of bi-annual inspections (where no previous inspection system has existed) and possible emission control system repair costs up to the $450 waiver limit.

Many states adopted I/M programs nonetheless: EPA threatened sanctions against states refusing to comply with statutory requirements, environmentalists and stationary source interests (seeking to avert further controls on themselves) publicly back the program, and policy makers knew that securing equivalent emission reductions would require even more controversial regulatory actions. Only a few states remained adamantly opposed -- including California, where the State legislature gave strong support to the service stations running its "Smog Check" program. In early 1994, EPA, facing intense political pressure, agreed to a hybrid plan for California that satisfied the opposition. But EPA's evident retreat from its previously adamant stand on the permissible design of an enhanced I/M program and its threat to impose discretionary sanctions has encouraged numerous other states to reopen their own I/M plans. EPA has approved some of the proposed revisions but has remained firm in dealing with other states, most notably Virginia.

Opposition to ECO and I/M has come from intensely motivated interest groups that want to avoid responsibility for or the consequences of EPA's policies and from elected officials who support these groups and/or fear public backlash from these programs. There has been very little countervailing pressure from state- or region-level sources. Policy proponents in State government, business groups, and environmental advocacy organizations have devoted little effort to building broad constituencies in support of either ECO or I/M, an admittedly difficult undertaking; and once vigorous controversies have broken out, many have retreated to the sidelines. When strong opposition has emerged EPA's threat of sanctions has therefore been the major inducement for State compliance; but the agency's ability actually to impose *discretionary* sanctions, given perceived White House intervention to block pressure on California, has greatly weakened the deterrent power of its threat. (The test of *mandatory* sanctions under CAAA has yet to come.)

Whether this resistance to ECO and I/M foreshadows more widespread opposition to CAAA mandates on transportation is unknowable. But the failure of those leading state implementation efforts to broaden their base of support leaves them highly vulnerable. Implementation of the 1970

and 1977 CAAA foundered when politically difficult policies were blocked by strong opposition or sidetracked by elected officials unwilling to risk such opposition. If this history is a guide, those currently managing CAAA and ISTEA implementation at the national, state, and regional levels should be seeking better ways of educating and securing consent from the diverse interest groups and citizens likely to be affected by the provisions of these laws. Such efforts are quite difficult to organize in the early phases of implementation; but they are far less likely to be effective if undertaken only when opposition has already mobilized.

7. FUTURE IMPLICATIONS

To date, the political volatility of CAAA implementation has been minimized by several factors. With the notable exception of ECO and I/M, most nonattainment areas were able to meet the pollution reduction goals of the 1993 ozone SIPs without imposing significant restrictions or costs on the driving public. Interim conformity procedures did not demand major shifts in transportation investment priorities. The 18-month "clock" for mandatory CAAA sanctions has provided a "safety valve" for states experiencing difficulty meeting CAAA deadlines or securing necessary legislative or regulatory authority for SIP measures; and EPA's handling of SIP submissions -- permitting committal SIPs and issuing "protective findings" for conformity purposes on SIPs under agency review -- has given states additional flexibility. EPA has threatened to use its most powerful policy instrument, discretionary sanctions (which can be imposed without delay), only in a few instances for refusal to institute enhanced I/M. And it has so far demonstrated both a decided reluctance actually to impose sanctions and considerable policy flexibility when confronted by tough controversies with states. Moreover, environmental advocates have brought few major suits against EPA under the transportation provisions of CAAA of 1990 -- both for strategic reasons and because the litigation "handles" of CAAA have proved more slippery than anticipated.

For several reasons, however, CAAA politics is likely to become more intense in the near future. ECO and enhanced I/M programs are actually being implemented, raising their public visibility still higher. (Maine's I/M program, for example, became embroiled in public controversy this past summer when inspections were initiated. The program was suspended at least temporarily in September.) Many areas expect difficulty in finding the emission reductions required for the 1994 SIPs; some face the choice of proposing more extensive and controversial transportation controls or failing to demonstrate attainment. Meanwhile, as MPOs phase in the final conformity procedures, they may have to make significant changes in the mix of transportation projects they program (especially to satisfy NO_X reduction requirements) or see their TIPs lapse, leaving only exempt projects eligible for Federal funding. As sanction "clocks" run down and tougher CAAA requirements activate more sanction countdowns, it becomes more likely that new-stationary-source-offset and highway-funding sanctions will actually be imposed on some states, as has already been the case for Vermont.

Any of these outcomes is likely to stir regional controversy and may result in conflict between the States and Federal Government, heightening pressure on EPA to relax CAAA enforcement or on Congress to countenance non-enforcement as it did under the 1970 and 1977 acts. (Indeed, in recent months, EPA has made a number of moves designed to ease the burdens imposed by the November 1994 SIP requirement and by the final conformity rule.) Moreover, as states and EPA address more difficult regulatory demands, the probability of litigation by environmentalists increases. Inevitably, Congress will be pressed to weaken CAAA. Whether these pressures once again will derail implementation is not clear, but CAAA institutional relationships and politics bear continued watching.

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