

2. MPO policy boards are beginning to recognize air quality issues. They are starting to understand that transportation systems have significant impacts on air quality.

3. FHWA and EPA are continuing their open dialogue on air quality issues. The Region 3 offices of EPA and FHWA have initiated joint meetings with MPOs to review air quality issues. EPA is active on the Region 3 intermodal planning group and comments on unified work programs. FHWA has been very responsive to these comments.

The Clean Air Act Amendments of 1977 substantially strengthen the role of local governments in development of transportation measures for air quality. Section 174 authorizes the designation of MPOs to develop transportation plans. Section 175 authorizes Congress to appropriate funds for the planning process. If the funds become available, the consistency review process as it now exists will be changed radically. TCPs will be developed through the federal transportation planning process and be incorporated by the state as part of the SIP. Whether or not additional funds become available, changes must occur to make air quality a regional goal.

1. MPOs must recognize that attainment and maintenance of air quality standards are not optional;

2. MPOs must accept responsibility for a portion of the emission reductions needed for attainment and maintenance of the air quality standards; and

3. Federal policies must require complete integration of functional planning (transportation, water quality, and housing) with air quality as a constraint.

The Clean Air Act Amendments of 1977 allow until 1987 for attainment of CO and HC standards. If those dates are to be met, state and federal agencies and MPOs must make a commitment to do everything reasonable to attain standards. The first step is the development of an adequate planning process.

#### REFERENCES

1. Federal-Aid Highway Program Manual, Vol. 7, Chapter 7, Section 9. Federal Highway Administration, Transmittal 105 HEV-10, Nov. 26, 1974.
2. Guidelines for Analysis of Consistency Between Transportation and Air Quality Plans and Programs. Interagency agreement between U.S. Environmental Protection Agency and Federal Highway Administration, April 1975.

## Air Quality Considerations in Transportation Planning

Elizabeth A. Deakin, Cambridge Systematics, Inc., Berkeley, California

For the past 5 years, transportation control plans and related air quality analyses of transportation projects have been the major focus of air quality considerations in transportation planning in metropolitan areas. Experience with control plans has been mixed: In many areas, tight deadlines, weak intergovernmental coordination, limited analysis of the costs and effectiveness of measures, and lack of public support for the plans combined to limit implementation of control measures. The Clean Air Act Amendments of 1977 include provisions to correct these problems. The amendments call for the development and implementation of plans to attain the national ambient air quality standards by 1987 under procedures that emphasize metropolitan, state, and local participation, consultation with elected officials and the public, and incremental progress in implementing transportation measures that improve air quality. The amendments authorize \$75 million for planning grants to nonattainment areas and forbid federal agencies to approve or fund any activity that does not conform to the plan approved by the U.S. Environmental Protection Agency. Federal agencies also must give priority to plan implementation. The amendments point to a process in which air quality considerations are an integral and continuing part of transportation planning. Wherever possible, the metropolitan planning organization would coordinate transportation air quality activities as part of the continuing, cooperative, comprehensive transportation planning process for the area. The unified work program, the long-range and transportation systems management elements of the transportation plan, and the transportation improvement program would document the actions being planned or programmed to improve air quality. Periodic reviews of procedures being followed and progress in implementation would serve as the basis for determinations of conformity and for funding decisions. A major unresolved question is whether the transportation planning process can be shifted away from consideration of air quality to the imple-

mentation of air quality improvement measures. This implies that the role of the metropolitan planning organization may have to evolve from coordinating and summarizing planning activities to orchestrating and catalyzing action. Next is the question of whether the incentive of planning funds and the threat of possible loss of federal assistance will be sufficient to induce agencies to experiment with those measures that often are perceived as visiting very clear inconveniences or costs on the public to reduce diffusely perceived threats to health and welfare. Finally, there are great uncertainties about whether and how a combined transportation and air quality planning process would be evaluated and whether pressures for responsiveness could be brought to bear effectively.

In recent years Congress has enacted legislation and the U.S. Department of Transportation (DOT) and the U.S. Environmental Protection Agency (EPA) have issued regulations to improve the quality of the ambient air in our cities through judicious management of the transportation system. To date, however, the results of these initiatives have been mixed. The goal of attaining national air quality standards by 1977 (enunciated in the Clean Air Act Amendments of 1970) could not be met in a number of metropolitan areas, so Congress responded by enacting the Clean Air Act Amendments of 1977. The 1977 amendments contain major provisions that will have a significant and direct impact on the process by which air quality is considered in transportation planning.

## EXPERIENCE WITH AIR QUALITY CONSIDERATIONS IN TRANSPORTATION

Transportation control plans (TCPs) developed in response to requirements of the Clean Air Act Amendments of 1970 have been the predominant factor in the transportation-air quality interface in most large urban areas. The plans, which at least initially included measures ranging from transit improvements to traffic management and, in some cases, gasoline rationing, became controversial from the moment they were announced. Experience in implementation has been mixed.

The problems TCPs have faced can be summarized: Extremely tight deadlines for plan development and promulgation took their toll on the quality of the plans that were produced. Rapid adoption of proposals for some very substantial and, in some cases, disruptive changes in urban transportation systems did not allow for adequate exploration of the social and economic consequences of the proposed measures, nor did it allow for adequate participation of metropolitan, state, and local agencies and officials in the planning and decision-making process. Limited or nonexistent experience with many of the proposed measures left doubts about their feasibility and cost-effectiveness. The 1977 deadline for attainment of the air quality standards allowed little time for investigation of alternatives, for experimentation with untested measures, and for accommodating the proposals within the budgetary and programming processes of the affected areas. Furthermore, the pressures of the attainment date forced the inclusion in the plans of measures that were universally agreed to be not only infeasible, but undesirable (gas rationing is the best example). These problems combined with a public perception that the benefits to be gained were uncertain, indirect, diffuse, and long term, whereas the costs were perceived to be immediate and, frequently, severe. The net result was opposition not only to some of the proposed measures, but in large part to the process by which TCPs were promulgated. In short, TCPs were viewed as constraints being imposed on the public, rather than as improvements being proposed for the public.

The TCP experience has not been without its successes. In fact, most urban areas have implemented several components of their TCPs, including preferential treatment of high-occupancy vehicles, employer-based carpooling programs, traffic flow improvements, and parking management actions. TCPs have been revised to eliminate many of the more controversial measures, and great emphasis has been placed on developing transportation actions that improve air quality through the normal transportation planning processes. Nevertheless, the TCP experience has highlighted the difficulties of achieving a specific environmental objective through modifications to the transportation system, particularly over the short term.

### DOT Requirements and Activities

It is useful to review two other DOT requirements that are relevant to air quality considerations in transportation. One is section 109j of title 23, U.S. Code, the Federal Highway Administration (FHWA) consistency determination requirements. The other is DOT's transportation improvement program-transportation systems management (TIP/TSM) regulations, which govern the planning and programming of urban transportation improvements administered by FHWA and Urban Mass Transportation Administration (UMTA).

Section 109j directed DOT to develop and promulgate guidelines to assure that highways constructed through

the use of federal funds are consistent with the applicable plan to achieve the ambient air quality standards. The FHWA regional administrator, after consultation with the EPA regional administrator, is responsible for making consistency determination annually, based on information and analysis provided by the metropolitan planning organization (MPO). A finding of inconsistency can lead to decertification of the MPO's transportation planning process and eventual withholding of federal highway funds.

FHWA and EPA have published joint guidelines for determining consistency. The guidelines state that a highway plan or program should not cause or exacerbate a violation, delay attainment, or interfere with maintenance of an air quality standard, and should contain all appropriate transportation measures from the plan to improve air quality. Interpretation of the guidelines is still being sorted out, and disagreements have surfaced over data and modeling for consistency determinations and over what response is appropriate when certain inconsistencies appear. Moreover, FHWA has based its determinations primarily on whether an adequate process for consultation with air quality agencies and for evaluation of air quality impacts has been established and followed. EPA has lobbied for greater emphasis on results—whether the process has led to decisions and actions that would improve air quality. This significant difference in the orientation of the two agencies highlights a major issue in the air quality-transportation interface: Is thorough consideration of air quality sufficient, or must that consideration result in decisions to take actions to improve air quality? The 1977 amendments partially address this issue. In any case, however, the consistency requirement explicitly links highway planning and air quality objectives by requiring assessment of the air quality impacts of proposed highway actions.

The TIP/TSM regulations, which were promulgated in September 1975, are less explicitly linked to air quality, but in fact hold great potential for integrating air quality and transportation planning by setting forth DOT policies and objectives that overlap to a considerable extent with EPA's. The regulations call for the annual development by the MPO of a transportation systems management plan designed to meet the short-term transportation needs of the urban area and emphasize the efficient use of existing facilities. TSM measures identified by DOT include many of the same measures proposed by EPA for their potential air quality benefits: preferential treatment of high-occupancy vehicles, carpooling programs, improved transit service, traffic flow improvements, automobile-restricted zones, parking management. TSM plans thus consider a variety of locally initiated policies and programs to bring about a more responsible and balanced use of the private automobile and a more effective utilization and organization of public transportation facilities and services. Although the major emphasis in the TSM regulations is on transportation efficiency, air quality considerations are listed as one of the criteria for TSM decisions.

The TIP requirement calls for the continuing development of a program of projects recommended from the TSM, long-range elements of the transportation plan, and plans scheduled for implementation over the short to medium range (3 to 5 years or more). UMTA requires programming and progress in implementation of selected TSM measures in urban areas that have a population of 200 000 or more (FHWA has not yet required TSM programming). Thus, the TIP is the link between planning and implementation in metropolitan areas. Like the TSM requirement, the TIP requirement is of great interest to EPA because it provides for the orderly pro-

gression of projects from planning to actual funding, a mechanism sorely needed if proposals to improve air quality are to become realities.

EPA views the TSM and TIP requirements as holding great promise for the implementation of air quality measures. But currently there are basic differences between the DOT requirements and EPA's needs:

1. DOT neither requires that specific criteria be met nor sets deadlines for attainment of objectives. EPA, in contrast, is responsible for ensuring that the air quality standards as well as the attainment deadlines are met.

2. DOT approves the process leading to plans and programs, not the MPO's plan and program measures. (UMTA capital grants are a clear exception.) EPA must approve the adequacy of the air quality plan's measures, in addition to the process.

Thus, although the TIP/TSM regulations are compatible with EPA's air quality program needs, they do not by themselves tie transportation and air quality planning together neatly.

#### Provisions of the Clean Air Act Amendments of 1977

The Clean Air Act Amendments of 1977 make sweeping changes to the procedures through which transportation-based air quality improvement measures are to be developed and implemented. Many of the new provisions were designed to avoid problems that occurred in transportation control planning under the 1970 amendments. Other provisions clarify the responsibilities of DOT and other agencies in support of actions to reduce air pollution.

The new amendments extend to 1987 the time for attainment of the standards for carbon monoxide (CO) and photochemical oxidants (section 172). By 1987, state, regional, and local officials in nonattainment areas must determine jointly the planning, implementation, and enforcement responsibilities that each level of government will assume. Where feasible, the MPO or the air quality maintenance organization should be responsible for the air quality planning process (section 174). An implementation plan remains the foundation for transportation-related air quality attainment; the amendments encourage the inclusion of programs for improved transit, exclusive bus and carpool lanes, street parking control, park-and-ride facilities, road user charges and tolls to discourage single-occupancy automobile trips, improved traffic flow, bicycle lanes and facilities, and employer participation in carpooling, vanpooling, bicycling, and walking incentive programs (section 108). Section 105 requires EPA to develop guidelines for planning transportation and air quality improvements, in consultation with DOT, U.S. Department of Housing and Urban Development (HUD), and state and local governments, and authorizes \$75 million for planning grants to the MPOs (to the designated agencies) for developing a planning process to link air quality planning to transportation and urban development planning.

By July 1, 1979, nonattainment areas must submit implementation plans that either show attainment of the CO and oxidant standards by 1982 or demonstrate to the satisfaction of EPA that such attainment is not possible despite the implementation of all reasonably available measures. In the latter case, a plan must be submitted by 1982 to demonstrate attainment as expeditiously as practicable but not later than 1987. The plan provisions must be adopted or promulgated after notice and reasonable public hearing (sections 172 and 178). After

July 1, 1979 or 1982 (depending on the attainment status), if a nonattainment area has not submitted or made reasonable efforts toward submitting a plan, EPA cannot approve projects or award grants authorized by the amendments and DOT cannot approve projects or award grants under title 23, U.S. Code, other than for safety, mass transit, or transportation improvement projects related to air quality improvement or maintenance in that area (section 176). The plans submitted to EPA must include not only measures to ensure attainment and maintenance of the standards, but also schedules and timetables for compliance (section 110) and other evidence of the necessary commitments to implement and enforce the plan provisions (section 174).

Two provisions of the amendments should increase the likelihood that the plans developed will be implemented. Section 108 provides that EPA, after consultation with DOT, HUD, and state and local officials, shall publish guidelines on:

1. Methods to identify and evaluate alternative planning and control activities;
2. Methods to review plans on a regular basis as conditions change or new information is presented;
3. Identification of funds and other resources necessary to implement the plan, including interagency agreements on providing such funds and resources;
4. Methods to assure participation by the public in all phases of the planning process; and
5. Such other methods as the administrator determines necessary to carry out a continuous planning process.

Section 108 also calls for EPA to publish information (in cooperation with DOT) on a variety of methods and strategies that will contribute to the reduction of automobile-related pollutants and on the effectiveness and impacts of such methods.

Section 176 adds the provision that all agencies of the federal government that have authority to conduct or support any program having air quality-related transportation consequences shall give priority in the exercise of such authority to implementation of air quality plan provisions, and specifies that the section extends to authority exercised under the Urban Mass Transportation Act of 1964, title 23, U. S. Code, and the Housing and Urban Development Act of 1965. Furthermore, section 176 stipulates that no federal agency shall engage in, support, financially assist, license, or approve any action that does not conform to an air quality plan, nor shall any MPO approve any nonconforming plan, program, or project.

#### THE EMERGING TRANSPORTATION AND AIR QUALITY PLANNING PROCESS

The transportation and air quality planning process that is taking shape as a result of the experience of the past few years and the provisions of the Clean Air Act Amendments of 1977 has several general characteristics. As experience in planning and implementing measures to improve air quality has accumulated, there has been a growing movement to locate primary responsibility for most transportation and air quality programs at the regional level, consistent with air quality control region designations and with transportation planning and funding practices. The 1977 amendments should accelerate this trend by assigning to the MPO (or air quality maintenance agency) lead responsibility for the air quality plan revision process.

The 1970 amendments assigned TCP responsibilities to state agencies, creating an inability to tie plan ele-



ments to programming and funding processes at the regional and local levels, vagueness about implementation and enforcement responsibilities, and a lack of local and regional agency commitment to policies and programs developed largely without their input. Here too, the trend has been toward greater sharing of planning and decision-making responsibilities consistent with existing institutional lines of authority. The 1977 amendments formalize this sharing by calling for state and local agencies to determine jointly which agency and levels of government shall have responsibility for each element of the vast array of planning, implementation, and enforcement actions necessary to carry out an adequate air quality plan. Furthermore, provisions of the amendments that call for continuing consultation and for evidence of ability to carry out the plans emphasize the need for a clearly defined, participatory planning process.

A major criticism of the first round of TCPs was that insufficient attention was given to alternative planning and control actions, to the identification of social and economic impacts, and to cost-effectiveness. The amendments not only require the development of information on these issues but also call for a planning process in which such information is developed and weighed in reaching decisions about appropriate courses of action. Furthermore, public involvement in the process and the provision of information to the public about air pollution problems and potential solutions should help make the alternatives analysis more meaningful.

The 1970 amendments set a tight deadline for attainment of the air quality standards but were mostly silent about procedures for meeting the deadline and about interim results. In contrast, the 1977 amendments set a more reasonable attainment date, but also call for expeditious implementation and incremental progress in the years preceding the deadline.

Under the 1970 amendments, EPA stood virtually alone in its responsibility for assuring that transportation control plans were implemented. The new amendments assign the major federal responsibility to EPA but also call for DOT and HUD support, not only in the development of guidance for the planning process but also through their approval and funding of transportation activities and other programs with air quality impact.

As the experience of the past 5 years has proven, the planning of transportation and air quality improvements overlaps to a considerable extent with ongoing transportation planning activities, and efficiency and effectiveness considerations indicate that at least some degree of merger is appropriate. The policy in many metropolitan areas is to develop air quality improvement measures through the ongoing transportation planning process. The new amendments affirm this practice, requiring coordination with the federal urban transportation planning process, and go further to require both compatibility between the air quality plan and other plans, programs, and projects that receive federal assistance, and priority assignment to air quality plan elements.

The process that is emerging thus creates a two-way link between air quality planning and transportation planning by requiring not only that the air quality planning process be consistent with the transportation planning process, but also that the transportation planning process support and assist air quality improvement efforts.

#### Proposed Guidelines

In response to section 108 of the Clean Air Act Amendments of 1977, EPA prepared draft guidelines on the

planning process for developing transportation components of air quality plans. The guidelines, which are being prepared with considerable input from representatives of state and local governments and federal agencies, emphasize the continuing development and implementation of transportation projects and transportation system management measures that provide incremental reductions in emissions from mobile sources as expeditiously as possible. The guidelines are designed to allow sufficient flexibility to accommodate the characteristics and practices of a variety of institutional arrangements.

The guidelines contain five major sections. The first section calls for the modification of the transportation planning process specified in DOT regulations to incorporate the air quality-related provisions of the Clean Air Act Amendments of 1977. Consistent with those amendments, the guidelines also call for strengthening certain elements of the existing process, including involvement of elected officials, assignment of responsibility to state, regional, and local agencies, alternatives development and analysis, public participation, and plan implementation.

The next sections of the guidelines address documentation of the transportation and air quality process in the transportation planning work programs, plans, and programs of projects, as well as in the air quality plan for the area. The guidelines recommend that the prospectus include a discussion of the transportation-related air quality issues facing the area and a summary of the planning program. The unified work program would include all air quality-related transportation planning activities anticipated for the metropolitan area, including planning to be funded by EPA grants.

The TSM element of the transportation plan would document the area's consideration of all short-range measures that have the potential of reducing transportation emissions; the long-range element would summarize the consideration of major changes to reduce emissions. The TIP, including the annual element, would specify the projects being programmed and implemented that would improve air quality; priority would be given to such projects in compliance with the 1977 amendments.

The revised air quality plan would be based on these modifications and inclusions to the transportation documents. In addition, an emissions inventory and a description of programs for citizen participation, inter-agency coordination, and involvement of elected officials would be included in the air quality plan.

The next section of the guidelines calls for periodic progress reports on the status of the unified work program and the transportation improvement program. The progress reports would be used as the basis for determining continued eligibility for EPA planning grants and to assist the determination of compliance with the conformity, priority, and reasonable progress provisions of the 1977 amendments.

Finally, the guidelines describe the process for progress and conformity determinations. The determinations would be based on a review of the transportation plan and program documents, the progress reports, and the area's consistency analysis. After consultation with the states, the responsible agency, FHWA, and UMTA, EPA would make a finding of conformity and determine that satisfactory progress could be achieved by taking specified corrective actions or would find that serious deficiencies require adjustment or termination of EPA funding or other actions.

The emerging process, then, would have self-enforcing provisions for the compatibility of air quality planning and transportation planning: the two plans would be, simply, documentation of the same planning process

and implementation activities. And the process would include a system of procedures, incentives, and sanctions designed to ensure that reasonable progress in implementing air quality improvements actually would occur.

#### Unresolved Issues

Although the emerging transportation-air quality process offers greatly increased potential for success, several nagging questions remain. The major objective of the proposed process is to shift transportation planning away from mere consideration of air quality toward actual implementation of air quality improvement measures. If this objective is to be attained, several issues must be resolved favorably.

#### The Role of the MPO

Currently, most MPO staffs perform feasibility studies and conduct certain area-wide planning efforts, but primarily they summarize and compile the planning and programming activities of local and state agencies and operators. In order to achieve the goal of regional and subarea air quality improvement, however, these disparate agencies and organizations will have to be mobilized for coordinated action. As planning agencies, MPOs simply do not have the authority (nor do they have the mandate) to direct other agencies to conduct studies or implement measures. Therefore, if coordinated action on air quality is going to occur, it will be largely dependent on the MPO in its role as a consortium of local (and state) officials reaching agreement that the members individually will take responsibility for air quality improvements.

MPO can offer valuable assistance, ranging from lend-a-planner programs and pass-through funding earmarked for particular studies or projects to studies of promising actions and identifications of the local or state agencies and officials who appropriately would perform further investigation of the actions. Many measures are appropriately planned and carried out by MPO staff (such as development of employer-based ridesharing programs). Nevertheless, the proposed process would necessitate goal-oriented commitment and responsibility on the part of local agencies and officials to a greater degree than has typically occurred in the past, plus stronger direction from the MPO as a forum and as a planning staff than has been common. Whether or not the incentives and sanctions of the proposed process will be sufficient to catalyze these changes remains to be seen.

#### The Problem of Perceived Costs

The transportation control planning experience of the past 5 years demonstrates the difficulties of implementing measures that are perceived by the public as imposing direct and immediate costs or inconveniences in return for modest reductions of dangers that are uncertain, indirect, diffuse, and long term. Although the proposed transportation-air quality planning process includes provisions for informing the public about air pollution problems, on one hand, and for selecting the most cost-effective, least disruptive measures possible, on the other, there is little reason to believe that political resistance to at least some of the proposed measures

(automobile restraints, for example) will fade away. In some areas, attainment by 1987 may be possible through some combination of reduced emissions from a better controlled and maintained vehicle fleet, with only a modicum of voluntary programs and transit improvements for good measure. In the metropolitan areas having the worst air pollution problems, however, attainment may necessitate the implementation of measures that do impose certain restrictions on automobile mobility, increase costs, or both. No doubt these measures would be controversial, and judicious use of incentives, sanctions, and lobbying would be necessary to achieve implementation.

#### Progress Evaluation and Sanctions

Implementation of transportation measures to improve air quality is likely to be heavily dependent on periodic evaluations of progress and threats of sanctions, as specified in the 1977 amendments. The assessment of how much progress is reasonable is always dependent on facts and circumstances and in each case will depend on intensive and complex negotiations, lobbying, and compromises. Sanctions are more difficult: for example, although the law specifies that DOT must give priority to air quality improvements and must not fund incompatible activities, it is vague on who actually determines what giving priority means and what constitutes incompatibility. For that matter, what does it mean to give priority to the implementation of certain projects, when the DOT approval process focuses on process adequacy, not plan and program specifics? The implication may be that in order for DOT to find the process adequate, that process will have to produce programming and implementation decisions that are in accord with the air quality plans. Such an interpretation is speculative, however. Moreover, the effectiveness of imposing sanctions on an MPO in instances where responsibilities assigned to state and local agencies and officials have been neglected is questionable. Thus, perhaps the greatest uncertainty is whether the driving force of the process (periodic evaluation, incentives, and sanctions) can be designed in a way that produces sufficient pressures to assure real action.

In summary, the outlook for improved consideration of air quality in transportation planning is promising, but the potential for controversy and conflicting objectives remains. The emerging process should correct many of the problems that occurred in the past, but a great deal of work is ahead for regional, local, and state agencies and officials in establishing the process and for EPA and DOT in managing it. Where air quality problems are worst, the success or failure of the process will depend, as it always has, on whether or not the public can be persuaded that cleaner air is worth certain sacrifices and that transportation actions can in fact improve air quality.

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