

sources of these pollutants. Therefore, if an MPO is the designated planning agency, how will it arrange for the planning of stationary-source controls? Conversely, if an AQMO is the designated agency, what arrangements are needed to coordinate its activities and those of the MPO?

Another set of issues concerns the structure of the transportation planning process. How does one identify transportation measures that improve air quality? How does one combine these measures into coherent packages that both improve air quality and serve other community objectives? How should potential measures and packages of measures be evaluated? When and how should elected officials and the public be consulted?

A final set of issues concerns decision making and

priorities. What criteria should be used to determine whether the transportation sector is making an adequate contribution to air quality improvement? Who should apply these criteria? How should conflicting claims on scarce planning resources by air quality planning activities and other planning activities be resolved? How should decisions be made as to the relative priorities of improving air quality and achieving other objectives when trade-offs must be made?

There clearly are no simple answers to these questions. Attempts to answer them must rely heavily on the experience of people who have dealt with them. The sharing of experience in transportation and air quality planning will contribute to an improved, integrated transportation and air quality planning process.

Experience With Consistency Reviews in Four Metropolitan Areas

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This paper reviews the experience of Region 3 of the U.S. Environmental Protection Agency in enforcing the section 109j consistency review process. After a description of the process, U.S. Environmental Protection Agency and Federal Highway Administration positions on consistency are examined and some reasons for differences are discussed. U.S. Environmental Protection Agency's experience in reviewing consistency in the Delaware Valley Region (Philadelphia), Southwest Pennsylvania Region (Pittsburgh), Baltimore Region, and National Capital Region is discussed. An assessment is then made of the status of the consistency process and future directions for consistency review are proposed. Although some progress has been made, the section 109j consistency review process has been generally ineffective. Some basic changes in attitudes and policies of metropolitan planning organizations and state and federal agencies are needed if the consistency review process is to become a useful tool for improving air quality.

The Federal-Aid Highway Act of 1970 added section 109j to title 23 of the U.S. Code, which requires that all highways constructed with federal funds be consistent with state implementation plans (SIPs) to attain and maintain national ambient air quality standards (NAAQS). In 1974 the Federal Highway Administration (FHWA) published regulations (1) for determining consistency with state air quality plans. These regulations set out the procedure that the state highway agency and metropolitan planning organization (MPO) first assess consistency and solicit comments from state and local air pollution control agencies. Differences should be identified and, if possible, resolved. The MPO annually makes a determination of consistency. This determination is forwarded through the state to the FHWA. FHWA, in consultation with the U.S. Environmental Protection Agency (EPA) annually assesses the degree of coordination between transportation and air quality

planning and reviews the determination of consistency. Significant deficiencies are grounds for FHWA to withhold planning certification.

In 1975, FHWA and EPA published joint guidelines for analysis of consistency between transportation and air quality plans (2). The guidelines were intended to identify levels of technical analysis required, commensurate with the severity of the air pollution problem in an urban area. The guidelines also set out five criteria that transportation plans and programs should meet in order to be consistent with SIPs. These criteria are

1. MPO transportation plans and programs must not exacerbate any existing violations of the NAAQS.
2. MPO transportation plans and programs must not contribute to a violation of the NAAQS for a pollutant for which no concentrations in violation of the NAAQS have been measured.
3. MPO transportation plans and programs must not delay the attainment of NAAQS.
4. MPO transportation plans and programs must not interfere with maintenance of the NAAQS once the standards are attained.
5. MPO transportation plans and programs must include all appropriate portions of state plans to implement NAAQS, including transportation control measures either adopted by a state or promulgated by EPA to reduce vehicle miles of travel (VMT), such as exclusive buslanes or carpool matching programs.

POSITIONS ON CONSISTENCY

After several years of experience reviewing consistency of urban transportation plans, it has become apparent

that there are significant differences in the way EPA and FHWA interpret section 109j, despite the existence of joint EPA-FHWA guidelines. These differences have made the section 109j process ineffective as a device for improving air quality. The major issues on which EPA and FHWA differ are

1. Definition of consistency,
2. Responsibility for air quality,
3. Adequacy of models, and
4. Corrective action required.

The five criteria contained in the FHWA-EPA guidelines are too general. FHWA's position is that consistency should be judged only on whether the transportation plan and program are consistent with the approved SIP. Although section 109j uses the word "approved", EPA believes that an inadequate SIP does not relieve the transportation planning process of responsibility for air quality. EPA's position is that a simple comparison of measures in the approved SIP with the transportation plan and program is not adequate.

FHWA believes that primary responsibility for attainment and maintenance of the NAAQS rests with air pollution control agencies. The transportation planning process has no responsibility to actively undertake measures to improve air quality, although FHWA believes such measures are desirable. EPA's position is that the transportation planning process and the resulting plan and programs must assume responsibility for at least a portion of the emission reductions needed for attainment and maintenance of the clean air standards.

FHWA's position is that currently available models are not adequate to make determinations of the attainment and maintenance status of air quality standards. EPA recognizes the shortcomings of current models, but believes that they exhibit at least the same degree of confidence as transportation planning models and are adequate for making decisions about air quality standards.

FHWA believes that strong encouragement of MPOs to consider air quality measures as transportation systems management (TSM) improvements is adequate. EPA believes that much stronger action is required because experience has shown that MPOs do not place a high priority on air quality.

Areas where EPA and FHWA have reached substantial agreement can be summarized as follows:

1. Complete implementation of control measures for both stationary and mobile sources will be required to attain and maintain air quality standards. EPA and FHWA agree that the transportation plan and program should not be solely responsible for attainment and maintenance of air quality standards. However, the degree of responsibility that transportation should assume is still a subject of disagreement.
2. The transportation portion of the SIP should be developed as part of the federal urban transportation planning process. One failure of the first transportation control plans (TCPs) is their lack of coordination with the existing transportation planning process. Transportation control measures for the first TCPs were developed by EPA and state and local air pollution control agencies. Attempts were then made to incorporate these measures into the transportation plan and program. The proper way to develop a new TCP is for the MPO to develop the measures and have the state incorporate them in the SIP.
3. FHWA and EPA should not dictate future land-use patterns. Major changes in land-use patterns may be

necessary to attain and maintain the air quality standards; however, FHWA and EPA agree that land-use decisions should not be made by the federal government.

REASONS FOR DIFFERENCES

Some of the differences in EPA and FHWA positions exist because of the differing nature of each agency's responsibilities. The Clean Air Act Amendments of 1970 require EPA to approve SIPs. Federal highway legislation does not give the FHWA authority to approve plans. The Clean Air Act requires that SIPs result in attainment of NAAQS. Federal highway legislation does not contain any specific standards that transportation plans must meet. The Clean Air Act Amendments of 1970 give no direct responsibility to FHWA for attainment of NAAQS. The Clean Air Act Amendments of 1977, however, have given FHWA authority to invoke funding sanctions in areas where adequate SIPs are not developed. The EPA is a regulatory agency and has no funds to implement transportation measures. EPA must, therefore, rely on other agencies for such implementation. FHWA is not a regulatory agency. It has responsibility to administer federal-aid highway funds.

CONSISTENCY REVIEW

Region 3 of EPA contains four major MPOs. The Delaware Valley Regional Planning Commission (DVRPC) is responsible for five counties in Pennsylvania and four in New Jersey; Philadelphia is the only major city. The Southwest Pennsylvania Regional Planning Commission (SPRPC) performs planning for six counties; Pittsburgh is its major city. Regional Planning Council (RPC) in Maryland is responsible for planning in the Baltimore area. The Transportation Planning Board (TPB) is the MPO for the Washington area, which is composed of the District of Columbia and portions of Maryland and Northern Virginia. The first year for MPO consistency determinations was 1974-1975.

Delaware Valley Region

The 1974-1975 assessment of consistency was based on an emissions burden analysis for carbon monoxide (CO) and hydrocarbons (HC) and contained some positive discussion on the implementation of the TCP. FHWA concurred with DVRPC's determination of consistency. Based on the submission, EPA's response was that, with the information given, a determination of consistency between transportation and air quality planning was not possible. The substantive issues of meaningful coordination between air and transportation planning and the responsiveness to air quality by the process were not addressed.

In 1975-1976, DVRPC performed a detailed diffusion modeling analysis for CO using the APRAC air pollution model and a burden analysis for HC. Also contained in the submission was a discussion of the Delaware Valley Region's active implementation of the TCP. FHWA in their letter to EPA expressed satisfaction that the transportation plan and program were consistent with the SIP. EPA responded by saying that the plan was inconsistent with respect to air quality and violations of the standards continued while the substantive planning issues were not addressed. EPA recommended that FHWA withdraw certification of DVRPC until the transportation plan was revised to be consistent with the SIP. Three meetings were held to discuss the technical issues on which EPA and FHWA disagreed. Little was resolved. FHWA strongly urged

DVRPC to consider air quality in their planning, but unconditionally certified DVRPC.

The 1976-1977 assessment of consistency again used APRAC to better define the air quality problem through the use of a hot spot analysis. The report was a fair assessment of the air quality problem: It noted the violation of air quality in the region and indicated failures in implementation of the TCP. The resolution adopted by the DVRPC board, however, gave little recognition that transportation plays a major part in the CO and oxidant problem. The board made no commitment to work actively to solve the problem. After further consideration of the air quality problem, however, the DVRPC board adopted a stronger resolution, which states in part:

... The DVRPC Board ... recognizes that air quality standards for the Region are not being met and that existing transportation plans will not by themselves result in attainment and maintenance of the carbon monoxide and photochemical oxidant standards. However, the Board also recognizes that attainment of these standards is directly tied to the long-range regional comprehensive planning process now underway and the Board confirms its commitment to develop functional plans and programs with achievement of national air quality standards as a goal. This will be done in close coordination with responsible air quality control agencies. Additionally, in the further refinement of the TSM element, full consideration will be given to measures that will aid in improving air quality. In view of these efforts, the Board finds the transportation planning process generally consistent with the state implementation plans.

In responding to FHWA, EPA stated that it was encouraged by the resolution and believed that implementation of the commitments would eventually result in a consistent plan, program, and process. EPA asked FHWA to monitor progress closely in carrying out the commitments and consider failure as grounds for withdrawal of certification.

Southwest Pennsylvania

The assessment of consistency for both 1974-1975 and 1975-1976 was based on a CO and HC emissions-burden analysis and some discussion of the implementation status of the TCP. In neither year was an adequate demonstration of consistency made. The substantive planning issues and meaningful coordination between air quality and transportation planning were not addressed. FHWA's determination for both years was that the planning process was consistent and adequately considered air quality. EPA did not agree with this determination and, in 1976, EPA recommended that FHWA withdraw certification of SPRPC until the plan is revised to be consistent with the SIP. FHWA did not accept this recommendation and certified SPRPC. FHWA, however, has been strongly urging SPRPC to perform adequate air quality analysis. The 1976-1977 determination has been delayed because of FHWA's dissatisfaction with SPRPC's technical evaluation.

Regional Planning Council (Baltimore)

The 1974-1975 statement on consistency between the regional transportation plans and programs and the air quality implementation plan for the Baltimore Region was approved by the Baltimore Region Transportation Steering Committee on June 26, 1974. The resolution by the committee found the plans to be generally consistent. The statement was based on some projections in the Baltimore Regional Environmental Impact Study and the TCP analysis that showed standards would not be met in 1977. Using this as a basis, RPC concluded that no change in the highway construction programs

would help achieve standards. EPA found the transportation plans and programs were inconsistent with the applicable SIP. FHWA did not agree and certified RPC.

The 1975-1976 statement was a reaffirmation of the earlier determination based on an update of status of implementation of some items of the TCP. EPA again found the transportation plans and programs to be inconsistent with air quality goals and recommended that FHWA withdraw certification of RPC. FHWA did not agree with the recommendation and certified the transportation planning process, but added a strong request that air quality be considered.

The 1976-1977 submission by RPC did not address previous concerns expressed by EPA. However, EPA noted that the draft general transportation plan and the recommended transportation system management elements indicated that the planning process was beginning to be responsive to air quality concerns. Although the plan was still inconsistent, EPA recommended that FHWA monitor progress carefully.

Washington Area

The 1974-1975 statement on consistency for the Washington, D.C., urban area was based on an emission analysis of the long-range transportation plan for the year 1992 and a working paper that reviewed the status of implementation of the control strategies. The FHWA submitted the determination to EPA and expressed the conclusion that the transportation plans and programs were generally consistent with the SIP with the exception that the plans and programs did not provide for the maintenance of NAAQS.

In the 1975-1976 determination of consistency, the supporting materials consisted of an air quality analysis for 1992 and a status of implementation of the TCP-related measures in the short-range plans. The analysis indicated that in 1992 microscale violations of the CO standards may occur in those areas of heavily congested traffic in central Washington. Also taken into account by EPA was the analysis of air quality data to determine the adequacy of SIP to attain and maintain the NAAQS, which resulted in a notification of the appropriate elected officials in the Washington, D.C., region that the SIPs needed revision. After consideration of these documents, EPA concluded that the highway portion of the plan was inconsistent with air quality goals and recommended that FHWA withdraw certification of the TPR. FHWA did not concur with EPA's recommendation and unconditionally certified the planning process. FHWA urged TPB to continue development of transportation measures to improve air quality.

In 1976 to 1977, EPA again found the plan and program inconsistent with air quality goals. EPA was encouraged, however, by TPB's endorsement of the need for continual refinement of plan elements to complement air quality planning. EPA asked FHWA to monitor implementation of this policy.

STATUS OF CONSISTENCY PROCESS

The experience of EPA Region 3 with consistency reviews in the four major metropolitan areas leads to several conclusions regarding the status of the consistency process.

1. The quality of the technical analysis has improved. The four MPOs are developing staff expertise to deal with air quality issues in transportation planning. This is an important step because of the need to know the air quality impacts of transportation plans and programs.

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

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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.