TRB Report Summary

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THE CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM Assessing 10 Years of Experience

The Congestion Mitigation and Air Quality Improvement (CMAQ) program was enacted as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 to assist nonattainment areas in meeting the strict new deadlines imposed by the Clean Air Act Amendments (CAAA) of 1990. In 1998 the program was reauthorized by the Transportation Equity Act for the 21st Century (TEA-21) for another 6 years, and funding was increased to \$8.1 billion.

STUDY CHARGE

After a decade of operation, congressional sponsors are interested in knowing whether the CMAQ program has been effective and whether its projects are cost-effective relative to other strategies for reducing pollution and congestion. *Special Report 264* presents the findings of a committee appointed by the Transportation Research Board in response to a formal congressional request for an evaluation of the program.

OVERVIEW OF PROGRAM OPERATION

The CMAQ program is targeted to states by means of a formula that takes into account the severity of air quality problems and the size of affected populations. The states are required to spend the funds in nonattainment and maintenance areas (areas that have not and have achieved compliance with air quality standards, respectively). The primary focus has been on areas designated as being in nonattainment for ozone and carbon monoxide, reflecting the pollutants of greatest concern when the CAAA and ISTEA were passed.

CMAQ funds are focused primarily on the transportation control measures (TCMs) contained in the 1990 CAAA, with the exception of vehicle scrappage programs, which are not eligible. TCMs are strategies whose primary purpose is to lessen the pollutants emitted by motor vehicles by decreasing highway travel (e.g., bicycle, pedestrian, and some transit projects) and encouraging more efficient facility use (e.g., ridesharing, traffic flow improvements). In addition, CMAQ funds may be used for projects that reduce vehicle emissions directly through vehicle inspection and maintenance (I&M) programs and fleet conversions to less polluting alternative-fuel vehicles. The funds are intended primarily for new facilities, equipment, and services aimed at generating new sources of emission reductions. Operating funds that support these projects are generally restricted to a 3-year period. The CMAQ en-

abling legislation explicitly prohibits funding construction projects that provide new capacity for single-occupant vehicle travel, such as the addition of general-purpose lanes to an existing highway or a new highway at a new location.

In the spirit of ISTEA, CMAQ project planning and decision making are decentralized. Policy guidance and eligibility criteria are provided by the program sponsors—the Federal Highway Administration (FHWA) and the Federal Transit Administration in cooperation with the U.S. Environmental Protection Agency (EPA)—but projects are initiated locally. Metropolitan planning organizations—the key agencies responsible for transportation planning and conformity determination at the regional level—generally have the primary responsibility for developing a consensus list of CMAQ projects for funding and programming in nonattainment and maintenance areas.

EVALUATION CONTEXT

Any evaluation of the CMAQ program must be undertaken with a realization of the magnitude of the air quality problem in the United States and with realistic expectations concerning the influence one relatively small program can have on reducing transportation-generated pollution, only one source of emissions. The resources provided by the CMAQ program are modest by federal transportation program standards, typically on the order of 2 to 3 percent of any given region's total transportation budget, and the funds are often widely disbursed in a diverse program of eligible activities. Relative to new-vehicle emission and fuel standards that apply to large segments of the vehicle fleet, most CMAQ-funded TCMs are very local in scale (e.g., an intersection improvement, a bicycle path) and affect a small segment of a large regional transportation system.

FINDINGS

On the basis of its review, the committee found strong support for the CMAQ program among a broad range of regional transportation planners, operating agency staff, air quality officials, and interest groups consulted for the study. However, it was not possible to undertake a credible scientific quantitative evaluation of the cost-effectiveness of the CMAQ program at the national level. The scale issues previously discussed, limited methods for measuring project effects on outcomes, and

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Nevertheless, with its diverse and often innovative project mix, the CMAQ program offers a valuable laboratory for measuring the costeffectiveness of individual projects or groups of projects at the local level. With more attention to evaluation procedures, great improvements could be made in the ability to track project effectiveness. The limited evidence available suggests that, when compared on the sole criterion of emissions reduced per dollar spent, control strategies aimed directly at emission reductions (e.g., new-vehicle emission and fuel standards, well-structured I&M programs, vehicle scrappage programs) generally have been more successful than most CMAQ strategies relying on changes in travel behavior. Nonetheless, the cost-effectiveness of some CMAQ-eligible TCMs—those involving regional ridesharing, regional transportation demand management, and pricing strategies.

There is considerable uncertainty about these conclusions, however. First, the comparisons are based on estimates of emission reductions for the ozone precursors only. Second, the wide range of cost-effectiveness results, even for the same type of CMAQ strategy, suggests that performance depends largely on context. Third, many TCMs may have benefits other than pollution reduction (e.g., congestion relief). Fourth, the estimates for nearly all strategies are affected by modeling uncertainties. Furthermore, measuring project cost-effectiveness involves a moving target; the pollution baseline against which project effectiveness is measured changes as vehicles and fuels become cleaner. Hence, the historical performance of CMAQ projects does not necessarily provide a basis for confident projections about their future cost-effectiveness.

The strongest evidence in favor of the program is qualitative. First, it is the only federally funded transportation program explicitly targeting air quality improvement. Arguably the most important benefits of the CMAQ program are the incentives and resources provided to local agencies to think seriously about strategies for improving air quality and reducing congestion. Second, the funds provided are restricted to these purposes, offering an opportunity for local nonattainment areas to experiment with nontraditional transportation approaches to pollution control and to forge new partnerships and greater interagency cooperation in the development of such approaches. Third, some of the most promising TCMs in terms of cost-effectiveness (according to admittedly uncertain data) receive limited if any support from traditional transportation funding sources, and thus depend on CMAQ for a full exploration of that promise. Fourth, the program helps nonattainment and maintenance areas fund the strict mandates and pollution control schedules required by the 1990 CAAA. Finally, CMAQ provides a flexible source of funds that can be used for a wide range of activities tailored to local pollution and congestion problems.

RECOMMENDATIONS

The committee's evaluation of the CMAQ program led to the following recommendations.

Program Continuation and Focus

1. The CMAQ program has value and, in the collective judgment of the committee, should be reauthorized with certain modifications noted below.

2. Air quality improvement should continue to receive high priority in the CMAQ program. Congestion relief projects that make important contributions to vehicle emission reductions should continue to be supported by the program, but existing restrictions on projects involving construction of new highway capacity should be maintained.

3. Consistent with maintaining a focus on the air quality dimensions of the program, state and local air quality agencies should be involved more directly in the evaluation of proposals for the expenditure of CMAQ funds.

Program Scope

4. The components of air quality addressed by the CMAQ program should be broadened to include all pollutants regulated under the Clean Air Act. At a minimum, the program funding formula and eligibility criteria should include particulates—now believed to pose a greater health hazard than any of the other criteria pollutants—as well as sulfur dioxide and air toxics.

5. Any local project that can demonstrate the potential to reduce mobile source emissions should be eligible for CMAQ funds.

6. Restrictions on the use of CMAQ funds for operating assistance should be relaxed if it can be demonstrated that using funds for this purpose continues to be cost-effective.

7. The use of CMAQ funds should be considered for land use actions designed to establish conditions for long-term reductions in future mobile source emissions.

Program Operation

8. The agency responsible for CMAQ project selection in each nonattainment area should develop a process by which projects can be identified, selected, and evaluated in the context of the specific air quality and congestion problems of that region. In turn, the federal CMAQ project approval process should be streamlined.

Program Evaluation

9. Recipients of CMAQ funds should be given incentives to conduct more evaluations of funded projects, and federal program sponsors should provide guidance on best practices.

10. A more targeted program of evaluation should be undertaken at the national level, to include in-depth evaluation studies, synthesis and dissemination of results, research on appropriate analysis methods, and monitoring. FHWA, in consultation with EPA, should take the lead in initiating such a program, financed in part by CMAQ funds set aside for this purpose.

COMMITTEE FOR THE EVALUATION OF THE CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM

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