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Institutional Factors in the Implementation of Automobile-Restrictive Measures

Part 1: Implementation Experience with Transportation Air Quality Measures in the Denver, Colorado, Urban Area

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In recent years, Denver's high altitude, topography, rapid growth, and heavy reliance on the automobile have combined to cause a severe air pollution problem. According to the Colorado Air Pollution Control Commission, the principal cause of the pollution is the use of motor vehicles. The Denver region developed an air quality plan that was submitted to the U.S. Environmental Protection Agency as part of the state implementation plan for air quality. The Denver element of the plan relies on strategies that reduce emissions at the tailpipe rather than strategies to restrict automobile use. Several institutional and attitudinal factors played a role in determining that automobile-restriction measures were not acceptable: (a) the no-problem syndrome, (b) the no-solution syndrome, (c) lack of public acceptance, (d) possibility of unequal burdens, (e) changing economic impacts, (f) agency priorities, and (g) difficulty in resolving conflicts. As the Denver region moves from planning to implementation of air quality strategies, it will be important for the state to transcend parochial political interests and take the difficult stands necessary. The state must also be careful not to make decisions in a vacuum. Ascertaining the public's opinion on air quality strategies will be critical to their successful planning and implementation.

Denver is known for its attractive environment and healthy climate. In recent years, however, Denver's high altitude, topography, rapid growth, and heavy reliance on the automobile have combined to give the "Mile-High City" a severe air pollution problem. The Denver region is currently experiencing frequent violations of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide, ozone, nitrogen dioxide, and suspended particulate matter. For example, in 1977 the second highest recorded 8-h average carbon monoxide concentration was 120 percent greater than the 8-h carbon monoxide standard [22.8 mg/m^3 (19.8 ppm) versus 10.4 mg/m^3 (9 ppm)].

According to the Colorado Air Pollution Control Commission (APCC) the principal cause of the pollutants is the use of motor vehicles. The commission estimates that vehicular sources account for 93 percent of the carbon monoxide emissions, 85 percent of hydrocarbon emissions (which are a primary precursor to ozone), 75 percent of particulate emissions, and 37 percent of nitrogen oxides. For three of the four standards, automobile use is the primary cause of the violations (1, pp. 11-20).

States in which there are areas that do not now meet the NAAQS must prepare revised state implementation plans (SIPs) that will ensure compliance with the air quality standards by December 31, 1982. Under certain circumstances, attainment of the standards for carbon monoxide and ozone may be extended to December 31, 1987. These revised SIPs must be submitted to the U.S. Environmental Protection Agency (EPA) by January 1, 1979. If the plans do not demonstrate the required compliance to EPA's satisfaction, severe sanctions on federally funded highway, sewer, and other construction can be imposed on the states and local governments.

DEVELOPMENT OF THE COLORADO SIP

Final responsibility for development of the Colorado plan rested with the APCC, an independent body appointed by the governor with the consent of the senate.

In order to prepare the statewide plan, the APCC considered the plans submitted by Denver and the four other nonattainment areas.

The Denver Regional Council of Governments (DRCOG) was designated by the governor as the principal participating agency for preparation of a proposed Denver regional element of the SIP. The DRCOG established two key working committees to prepare a draft plan. These were the Clean Air Task Force, which consisted of representatives of key interest groups in the Denver regional community and whose membership was jointly appointed by the DRCOG chairman and the governor and the Air Quality Policy Committee, which was composed of an equal number of voting representatives from the DRCOG and the Colorado APCC. The policy committee also had one nonvoting member from the Colorado Highway Commission and the Board of the Regional Transportation District, the local transit operating agency. The Clean Air Task Force and the Air Quality Policy Committee met regularly from July to November to prepare a draft proposed air quality plan for submittal to the DRCOG (2, p. 34). On November 17 and 18 the APCC held public hearings on the SIP, which included the Denver element. After adoption by the state APCC, the governor submitted the SIP to the EPA on January 2, 1979.

RECOMMENDATIONS OF THE DENVER PLAN

The Denver plan relies almost entirely on strategies to reduce automobile emissions at the tailpipe and strategies that encourage the voluntary use of modes of transportation other than the single-occupant automobile. For example, the plan asks the state legislature to expand the automotive inspection and maintenance program to include 1968 and later vehicles instead of 1977 and newer automobiles. Other strategies include a doubling of transit ridership by 1982, a vanpool demonstration program, a regional bicycle plan, expansion of the carpool matching service, studies of a regional traffic signal control system and high-occupancy vehicle (HOV) treatments, and the preparation of a regional parking management plan "designed to complement other transportation control strategies...." (2, p. 34).

All in all it is a modest, but perhaps realistic, plan. According to the preliminary assessment conducted by the APCC, the proposed measures will not permit attainment of the standards for carbon monoxide and ozone by 1982 nor for ozone by 1987, unless ozone standards are liberalized. In other words, Denver has come up with a plan that will not make compliance with the national standards possible, either by 1982 or 1987.

Some members of the Clean Air Task Force and the Air Quality Policy Committee issued a minority report that makes more stringent recommendations. The minority report supports the majority's inspection and maintenance proposal but otherwise characterizes the adopted plan as being composed chiefly of preexisting highway and transit plans, of calling for innumerable studies, and of relying on voluntary action. The minority plan, among other things, recommends three strategies to limit automobile use:

1. Use of private automobiles restricted one day a week, through a mandatory program to begin January 1, 1982, if voluntary efforts are inadequate (this was formally included in the SIP just prior to adoption and submittal by the governor);
2. Parking management plans to be developed by all local governments that must consider numerous strategies, including a moratorium on all new parking facilities, a surtax on all parking in the region, and preferential parking for HOVs; and
3. Development of automobile-restricted zones in addition to the one planned for the central business district.

Many factors, of course, played a part in the decision not to include automobile restrictions in the majority plan. Included are the institutional and attitudinal factors listed below.

The No-Problem Syndrome

Because of the difficulty in determining air pollution's causative role in diseases or disorders, it is asserted by some interests that Denver's air quality situation is an aesthetic, but not a public health, problem. It is then argued, quite logically, that if there is no problem, no remedial steps are necessary.

The No-Solution Syndrome

Although they concede that there is a problem, some opponents to automobile restrictions believe constraints on automobile use offer no solution. For example, this group theorizes that proposals to limit downtown parking would force shoppers to shop in the suburbs and encourage businesses to relocate to the suburbs. Such changes, it is said, would increase vehicle travel distances and, consequently, air pollution because of the greater distances to be driven and the decreased access of public transit in the suburbs. Also, they insist that restrictions should not be considered unless there is absolute proof that they will solve the problem. Such proof clearly is not feasible.

To complicate things even further, a recent study by DRCOG on the impact of air quality from changes in land-use and transportation patterns showed some interesting results. Changes in development patterns, densities, and modal splits between automobiles and transit showed insignificant changes in carbon monoxide levels. The inability of the predictive models to relate development densities with travel behavior may account for these unexpected conclusions. For ozone, a more pernicious pollutant in Denver, only an increase in the highway level of service showed an improvement leading to near attainment of the proposed 195 $\mu g/m^3$ (0.1 ppm) standard by the year 2000. This is due to the fact that ozone pollution, which results from mixing hydrocarbons and oxides of nitrogen in sunlight, increases with congestion and resulting speed reductions, remains essentially constant with decreases in vehicle kilometers of travel because reduction in vehicle kilometers of travel results in a constant balance of hydrocarbons and nitrogen oxides, and is reduced only with increases in traffic speed.

Lack of Public Acceptance

Numerous surveys of residents of the Denver metropolitan area indicate a high level of concern about the region's air pollution problem. A recent survey commissioned by the APCC revealed that air pollution was believed to be the area's most serious problem. On the other hand, this and other surveys also reveal an unwillingness to alter automobile driving habits. This uncertainty about the public's reaction to automobile-restriction measures has been a significant factor in the reluctance of elected officials to enact stringent air pollution measures. If a clear mandate to clean the air and to change life-styles were evident to the local and

state legislators, they would pass the appropriate legislation.

Possibility of Unequal Burdens

Referring to the concept of a no-drive day, one day a week, the draft Denver element of the SIP depicts one of the disadvantages (2, p. 34): "...(it) may place serious burdens on those for whom there is no practicable alternative to the automobile, especially one-car households."

Inspection-maintenance programs and increased parking rates are other strategies that may affect most acutely those who are least able to afford the sanctions.

Changing Economic Impacts

One of the major factors in resisting automobile constraints is the fear of economic dislocations. Many communities, especially those that represent the core city areas, are concerned that transportation controls may exacerbate the problems of inner-city stagnation; they are concerned that the attractiveness of the city vis a vis the suburbs for working and living will be tipped in favor of the suburbs. There also exists a fear that, if the Denver region implements automobile-use restrictions, it may be at a disadvantage when competing for new businesses with cities that have less severe air pollution problems and hence less stringent automobile restraints. Continued air pollution could also place the Denver area at such a disadvantage. A study recently completed by Cambridge Systematics reported (3, pp. 1-36):

> In addition to their intended results, air quality transportation measures may change the competitive position of one area relative to other locations in the metropolitan region. Although they are unplanned, these secondary economic impacts are not unimportant. If they are adverse, they can impose economic hardship, producing a loss of retail sales, a contraction of job opportunities, vacancies in buildings, and declines in the value of property as economic activity shifts to other parts of the region. Fear of such losses lies behind the common opposition of the downtown business community to transportation controls and associated policies.

Agency Priorities

Each agency involved with transportation in Denver has its own agenda consistent with its particular mission. Even though most of these agencies are pursuing programs that are compatible with clean air goals, these goals are rarely a high priority within each agency. In order for air quality programs to receive a higher priority, each agency will have to reallocate its financial and staffing resources. Most entities are unwilling to do this when such programs are not synonymous with their highest priorities. No agency, with the possible exception of the APCC, has moved automobile-restriction measures to a position of high priority. Hence, there is little institutional push for these measures.

The priorities and activities of several agencies illustrate this problem. For example, the 1978-1982 transportation improvement program of DRCOG describes potential highway projects as being evaluated by a volume-to-capacity ratio, a hazard index, and a sufficiency rating. Air pollution mitigation factors are added on as one of the criteria, but not the primary one (4, p. 27).

The Denver Regional Transportation District feels that all of its actions improve air quality and, therefore, tends to emphasize objectives that indirectly affect air quality, such as fleet modernization and expansion, efficient use of road space, and park-and-ride facilities.

Indicative of the problem of priority that faces local traffic engineering divisions is the situation of the Denver Department of Public Works. Long known for its innovative approaches to improving vehicular flow and access to the central business district, this division is understandably reluctant to implement strategies that are contrary to these objectives.

The Colorado Department of Highways is not immune from the conflict of priorities. Since the air quality problem is so closely tied to transportation, many agencies, interest groups, and individuals look to the department to implement and influence the implementation of many SIP strategies. Often the expectations are beyond financial or legislative limits placed on the department. The department's primary mission is to build, operate, and regulate an effective and safe highway transportation system. Efficiency, economy, and safety, not cleaner air, are the forces that motivate the development and programming of highway actions. On the other hand, each major highway project is subject to an environmental assessment in which air quality impacts are calculated and compared to federal ambient standards and requirements within the SIP for air quality. The assessment is also reviewed by the Colorado Department of Health and appropriate federal agencies. On this basis, air quality does not drive the highway program but rather is a check on the development of a particular project.

In recent years, however, the highway department has become much more sensitive to the issue of air quality and energy conservation and has programmed and expanded several million dollars of Interstate highway funds for park-and-ride lots operated by Denver's Regional Transportation District and has made state and federal highway funds available for carpooling and vanpooling activities as well as bikeway construction.

Some clean air activists have charged that these steps are not sufficient and that the highway department as well as local government should formulate transportation improvement projects, highway and transit, with the express purpose of improving air quality with other transportation objectives that receive less emphasis and should avoid adding to the highway capacity in the Denver area. This is an unreasonable challenge to transportation planners since it is contrary to the mission and legal charge of transportation agencies. In many instances, such an objective could lead to the closing of major streets to vehicular traffic or the indiscriminate designation of existing lanes for HOVs. The closure of state highways that are major arterials for leading traffic to and through communities would be a disservice to the traveling public. The closure of local city streets, however, is more likely to be accepted and is being considered by the city of Denver and the Regional Transportation District. Dedication of new lanes for HOVs is being considered but with much greater caution. The experience on the Santa Monica Freeway in Los Angeles has put all transportation professionals on their guard. Preliminary studies have indicated that the total breakdown of traffic flow in the non-HOV lanes would clearly be unacceptable to the public in terms of accidents and congestion and would also be damaging to efforts to clean the air. The department supports careful consideration of other automobile disincentives, including no-drive days on a voluntary basis, judicious use of parking charges to discourage excessive automobile use, and more compact mixed land-use developments where it can be clearly shown that single-occupant automobile use will be reduced without disproportionate degradation of social, economic, or environmental conditions.

Denver is experiencing a 7 percent annual growth in vehicle kilometers of travel, and its buses are filled to capacity during peak periods. On this basis a deliberate

policy of no expansion of highway capacity, as has been proposed by many air quality activists, would be unacceptable. One exception is along corridors that lead to the center city of Denver, where bus line-haul capacity can more readily be expanded and where downtown congestion and excessive dedication of scarce land for parking purposes make an increase of automobile traffic particularly undesirable. In fact, the DRCOG's Transportation Committee, at the highway department's urging, has adopted a policy of giving transit expansion preference over highway expansion along radial corridors that lead to the center city of Denver.

Difficulty in Resolving Conflicts

As the agency responsible for developing the Denver element of the SIP, the DRCOG is in a sensitive position. DRCOG receives funding support from local units of government—both suburban and urban. The problem of changing economic impacts is essentially a problem of urban versus suburban fortunes. Therefore, in order not to jeopardize support from either faction, the DRCOG tends to avoid those issues of economic impacts. Another element in DRCOG's fragility is the fact that its governing board consists of local elected officials. This dilemma is characterized in the Cambridge Systematics study as follows (3, pp. 1-36):

> The Denver Regional Council of Governments, recently designated as Denver's metropolitan planning organization, has been reluctant to become actively involved in either the planning or implementation of air quality measures, in large part because of their controversial nature. Because of its voluntary membership and lack of independent funding sources, DRCOG must be very sensitive to the views of its diversified member jurisdictions. As a result, DRCOG has difficulty in making policy choices on controversial issues, and the policies which it adopts are moderate enough to satisfy the majority of its members.

Shifting economic balances is not the only controversy that can complicate DRCOG's role. Only two weeks after the Denver element was officially adopted, the city of Boulder, one of the members of DRCOG, considered a move to withdraw from the council of governments. Boulder's stated reason for such a consideration is the fact that the region could lose some of its federal funds because of the Denver element's inadequacy in meeting federal criteria. Boulder's air is cleaner than Denver's, and it might be penalized even though it meets the air quality standards.

CONCLUSION

Of the factors that I have cursorily examined, the two most critical are the fears of changing economic impacts and the difficulty of regional councils of government in resolving conflicts. In fact, these problems probably underlie many of the other factors. It may also be true that some of the other concerns are put forth to divert our attention from the real issues.

As we move from planning to implementation of transportation control strategies, I think the lessons provided in the development of the SIP will be valuable. It is imperative to devise strategies that will not adversely affect the economy of one area to the benefit of another.

The state must play its part in addressing the issue. The state should have the expertise, authority, and broad perspective to transcend parochial political interests to take the difficult stands necessary. In this role, however, the state must be careful to avoid making decisions in a vacuum. Previously, the APCC developed regulations that did not sufficiently incorporate the other actors into the process and the regulations were not well received or enforced. The state needs the advice and support of local governments, the state legislature, and the public at large in order to select strategies that will be workable.

Finally, and perhaps most importantly, it is essential to ascertain the opinion of the public. In the discussions that occurred during the preparation of the Denver element, a recurring argument was that a given strategy would not be acceptable to the public. When the public hearings were held, however, many observers were surprised at the support voiced for stronger measures and the willingness of citizens to change their life-styles. Such demonstrations of public will are necessary to influence the APCC in its drafting of the final SIP, to encourage the state legislature to adopt strict laws, and to convince public agencies to rearrange their priorities. But are those who show up at meetings truly representatives of the public? Perhaps not, but regardless, they are the ones who showed concern and interest and, therefore, their views should guide officials.

Overall, the Denver process is workable. A broad range of interests and perspectives was brought together under difficult time constraints and a modest and realistic plan was produced. It will be interesting to follow the machinations of the institutions once the implementation of the programs begins.

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