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Changing Highway Priorities: Construction, Economy, and Environmental Improvement

Peter G. Koltnow

American highway development has entered a new era in which improving the quality of the environment, especially the urban environment, has become one of the important purposes of road development. It is no longer satisfactory to build a good road that will simply permit the safe and efficient movement of people and goods. This changing pattern of United States highway development follows a well known sequence of primary considerations affecting all modes of transportation.¹

Three Stages of Transportation Development

The traditional first stage in transportation development is the provision of a linkage that overcomes physical boundaries between origins and destinations—rivers and mountains, for instance. The main object is simply “getting there,” regardless of the difficulties involved. During this stage, advantage is taken of whatever assistance nature can offer—*e.g.*, river fords and mountain gaps. The second stage places greater emphasis on economy and efficiency of movement. As physical barriers are overcome, it becomes important to provide transportation which best minimizes cost of movement. The third stage involves the effort to use transportation to further other worthy goals, as the system involved has already overcome the physical barriers to movement, and provides an acceptable level of economy. Chief among these goals, certainly in our urbanized society, is the improvement of the quality of life for those living in cities.

The progress of the American highway system from the first transportation stage into the beginnings of the last is reflected in the scope of federal legislation and administrative requirements. The first substantial federal

1. Davis, *The Transportation Horizon*, INSTITUTE OF TRAFFIC ENGINEERS, 1965 PROCEEDINGS, 35TH ANNUAL MEETING, 44, 47 (1965).

step was the Federal-Aid Highway Act of 1916² which provided for construction of rural post roads and established the still-functioning federal-state partnership in road matters. By 1969, the federal emphasis had shifted from "getting the farmer out of the mud" to more urban needs, particularly those involving environmental matters. This is demonstrated by Bureau of Public Roads Policy and Procedure Memorandum 20-8 which established the so-called "two hearing" process.³ This process, designed to improve and expand upon the longstanding provisions of federal highway regulation regarding public hearings, includes reference to 23 categories of subjects having economic, social, or environmental effects, which should be considered in the planning and design of federal-aid highways.⁴

Changing Priorities

Regulations have mirrored the substantial changes in attitudes toward highways, and have usually followed, rather than preceded them. One of the problems facing roadbuilders today is that the institutional and organizational arrangements which govern highway development have lagged behind public—and even road builders'—concern over environmental issues. This tends to put public agencies in a position of response, rather than leadership.

The shift in attitudes with respect to the primary purpose of highways can be seen by comparing the Federal-Aid Highway Act of 1944,⁵ which established the interstate highway program, with a recent policy statement from the National League of Cities⁶ which typifies a later point of view. The Act states that among the purposes of the interstate system is "to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers"⁷ This excerpt contains elements of both the first and second stages of road development: connections between important points, and routes as direct as practicable—the economic function. On the other hand, in a 1970 policy statement the League states as its first urban transportation objective: "The transportation system is a tool for shaping the growth of urban areas and must have as a *primary* goal the improvement of the quality of the urban environment."⁸ From some points of view, at

2. Act of July 11, 1916, Pub. L. No. 64-156, 39 Stat. 355.

3. 23 C.F.R. ch. I, pt. 1, app. A (1970).

4. "Social, economic, and environmental effects" means the direct and indirect benefits or losses to the community and to highway users. It includes all such effects that are relevant and applicable to the particular location or design under consideration. *Id.*

5. Ch. 626, 58 Stat. 839 (codified in scattered sections of 23 U.S.C.).

6. NATIONAL LEAGUE OF CITIES, 1970 NATIONAL POLICY STATEMENT, pt. 6, § A.

7. 23 U.S.C. § 103(d) (1964).

8. NATIONAL LEAGUE OF CITIES, *supra* note 6.

least, urban transportation is clearly into its third stage.

The League's statement reflects a common concern, and, of course, omits mention of a commonly overlooked fact, *i.e.*, that our technology is far more able to devise transportation systems to satisfy transportation needs than it is able to use these systems to shape growth and improve environmental quality. Also overlooked is the fact that safety and mobility, the traditionally desired end products of transportation improvements, are themselves highly valued as part of a total "environment."⁹

We are now clearly in transition between the second and third stages of highway transportation development. The national highway system—composed of federal, state, county, and municipal road networks—can certainly use continued improvement in terms of safety and economy.¹⁰ Almost a quarter of our 3.7 million mile road system has no all-weather surface.¹¹ Rapid population and employment decentralization within urban areas has accentuated congestion problems on the peripheries of our major urban centers.¹² Our motor vehicle fatality rates on a registration or vehicle mile basis are no better than they were a dozen years ago. And on a population rate basis we are just where we were forty years ago.¹³ Plainly, the nation must satisfy immense highway transportation improvement needs in order to provide the transportation quality essential to an industrialized society.

At the same time the public looks upon highway transportation as a relatively satisfactory service, even in urban areas. In spite of rhetoric about imminent strangulation and freeways being endless parking lots, most urban dwellers know that they can get to work with predictable regularity and with an acceptable, if imperfect, mobility. When people are free to choose where they want to live, they seldom make that choice on the basis of physical

9. See, *e.g.*, BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT, MASSACHUSETTS DEP'T OF PUBLIC WORKS, EASTERN MASSACHUSETTS REGIONAL PLANNING PROJECT, RECOMMENDED HIGHWAY AND TRANSIT PLAN 15 (1969). The plan contains statements of transportation goals, objectives and policies, and the authors include the objectives of "elimination of existing elements in the transportation system that are harmful and hazardous" as one of the objectives in the general goal of improving the quality of the physical environment. *Id.*

10. BUREAU OF PUBLIC ROADS, FEDERAL HIGHWAY ADMINISTRATION, U.S. DEP'T OF TRANSPORTATION, 1970 NATIONAL HIGHWAY NEEDS REPORT 52-53 (1969). The Bureau of Public Roads estimates capital expenditure requirements for existing highway systems to be \$320 billion for the period 1970-1985—an average of \$21 billion annually. At the present time, annual capital expenditures for all highways amounts to about \$10 billion. Total annual expenditures for highways amount to about \$19 billion for all road systems in the country. *Id.*

11. BUREAU OF PUBLIC ROADS, HIGHWAY STATISTICS 1968, FEDERAL HIGHWAY ADMINISTRATION, U.S. DEP'T OF TRANSPORTATION, Table M-3, at 162 (1968).

12. Allison, *Changes in Travel on the Major Highway Network: 1956 to 1965*, C.A.T.S. RESEARCH NEWS, February 1970, at 1 (Chicago Area Transportation Study).

13. NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 59 (1969).

proximity to work.¹⁴ About nine out of ten motoring commuters get to or from work in 40 minutes or less, and over a quarter of them drive less than 15 minutes.¹⁵ Moreover, a 45 minute radius encompasses the entire area of all but a few American cities.¹⁶

However, perception of urban transportation as a relatively satisfactory service does not extend to transportation as part of a satisfactory environment. While there are examples of attractive urban highways, which are pleasures to drive on, and even to live near, such examples seem far too infrequent and inadequate to satisfy our desires for a more attractive and humane cityscape. Fortunately, there is substantial and growing agreement among planners, highway builders, government leaders, and designers from many fields, that highways can and should be assets to the environment.¹⁷ Highways should fit the landscape, avoid disrupting neighborhoods, and minimize dislocation of residents and businesses. We all want quiet neighborhoods, attractive vistas, intact parks, and clean air. The question is not whether we should have these things, but how.

Environmental Impact

The environmental impact of highways can be divided into three parts. One includes the visual and esthetic impact. A second relates to air and noise pollution. A third encompasses the highway as a physical element on the urban scene, a determinant of land uses and a substantial land use in itself.

Visual and Esthetic Impact

At one time the visual impact of roads was largely the concern of good designers, who found opportunities in the design of individual roads, or occasionally entire road systems, to enhance the visual pleasure of those either using highways or living and working near them. The American parkway

14. Lansing & Mueller, *Residential Location and Urban Mobility*, HIGHWAY RESEARCH RECORD NUMBER 106 at 77 (1966).

15. U.S. BUREAU OF THE CENSUS, 1963 CENSUS OF TRANSPORTATION, PASSENGER TRANSPORTATION SURVEY 62 (1966).

16. Blumenfeld, *The Modern Metropolis*, SCIENTIFIC AMERICAN, Sept. 1965, at 64. In effect, with the special exception of New York City, commuters can live just about anywhere in a metropolitan area and be within about a 45 minute drive of the center. This seems to be an acceptable—and achievable—commuting limit for most people in most areas. Information is harder to obtain for commuting trips to other parts of metropolitan areas. Such trips are assuming greater importance all the time. In large cities only about ten or fifteen percent of metropolitan area employment is in the central business districts. By the end of this decade over half of all metropolitan area jobs will be in the suburbs. A good summary of trends in urban travel and employment is found in Ganz, *Emerging Patterns of Urban Growth and Travel*, TRANSPORT REPORT 68-1 (1968).

17. AUTOMOTIVE SAFETY FOUNDATION, URBAN HIGHWAYS IN PERSPECTIVE (1968).

movement, typified by the Bronx River Parkway, activated in 1922, was specifically viewed as a way of combining the best in automotive transportation with the highest quality of esthetic design. This parkway combined access control, grade separation, and gentle curves, with wide rights-of-way and heavy landscaping. This design provided good transportation for passenger cars, and an acceptable neighbor to local residents. Parkways were relatively uncommon, however, largely because of the costs involved. This reflected the dominant concern of economy in roadbuilding.

In more recent years the renewed emphasis on esthetics in highways has arisen largely from pressures outside the highway construction fraternity, although there has been support from progressive highway builders, as well. The First National Conference on Highways and Urban Development in 1958, and the Hershey and Williamsburg Conferences since then, evoked the following resolves: (1) "Highway engineers should create esthetically attractive facilities . . ."18 (2) "Visual aspects of freeway location and design should be considered . . ."19 (3) "Transportation facilities should be attractively designed to the end that they contribute to the beauty of the areas through which they pass."20 These meetings included representatives from highway agencies, other government groups, and the major design professions.

While highway designers have gradually made progress in highway design techniques, the real impetus to esthetic improvement has been generated through Congressional action and federal directives which sought first to overcome obvious visual problems, and later to identify esthetic opportunities. The Highway Beautification Act of 196521 reflected the Johnson administration's concern about the issue. Without attempting to define "beauty," a hazardous and perhaps futile effort, the Act clearly implied that junkyards and billboards detracted from the highway environment. Here we can see a reflection of the changing definition of public purpose, and a growing desire to use the police power as a creative tool for the good of society—a federal effort which President Johnson termed "a creative conservation."22

The Highway Beautification Act was related to a continuing effort by state and local governments to cope with another undesirable visual and physical product of automotive transportation, the abandoned vehicle. Mo-

18. THE SAGAMORE CONFERENCE ON HIGHWAYS AND URBAN DEVELOPMENT, GUIDELINES FOR ACTION 14 (1958).

19. AUTOMOTIVE SAFETY FOUNDATION, FREEWAYS IN THE URBAN SETTING (1962).

20. AUTOMOTIVE SAFETY FOUNDATION, REPORT ON THE SECOND NATIONAL CONFERENCE ON HIGHWAYS AND URBAN DEVELOPMENT 10 (1965).

21. 23 U.S.C. §§ 131, 136, 319 (Supp. V, 1970).

22. WHITE HOUSE CONFERENCE ON NATURAL BEAUTY, BEAUTY FOR AMERICA 2 (1965).

tor vehicles are among the very few kinds of publicly recorded private properties. Some state registration statutes are clearly aimed at discouraging casual abandonment of vehicles, partly because of the public costs of removal and final "processing," and partly because of the poor visual impact. Abandoned automobiles are a substantial waste product of automotive transportation, as evidenced by the abandonment of 2,500 cars daily.²³ Their final disposition is complicated by the fact that disposal costs may exceed the value gained by the disposer. An attempt to overcome this was recently made in Maryland where financial assistance is offered to dismantlers.²⁴

Junkyard and billboard controls,²⁵ encouraged by the federal government through financial rewards to cooperating states, represent one way of improving the visual effects of automotive transportation after the fact. Billboards represent a land use, not a highway product, but their intimate relationship to highways puts them in the same category as other highway by-products.

More recent progress in improving the looks of roads stems from two developments. One is the growth of design techniques which aid the highway planner and designer in visualizing the appearance of his road before it is built. Another is encompassed in the legal requirements that highways be built with a sensitivity for the important esthetic elements of a community.²⁶

The design techniques are many and varied. One involves an inventory of the dominant visual characteristics of alternate routes and a procedure for recognizing these characteristics in route location. Another consists of graphic displays generated by computers, enabling designers to visualize the results of design alternatives. A third incorporates special cameras "driving" on scale models of proposed highways, producing movies or slides of what the driver will see in the final product. A fourth technique is a renewed emphasis on multidisciplinary design teams, incorporating a number of special skills and including those most attuned to esthetic considerations. A fifth technique is more related to the finished highway product, *i.e.*, greater use of rounded contours, landscaping, and improved street "furniture."

Landscaping in particular is heavily utilized. For example, in Los Angeles, maintenance of plantings is one of the largest single highway maintenance expenditures.²⁷ There are now over 300 landscape architects employed by

23. Address by William S. Storey, Executive Vice President of the Institute of Scrap Iron and Steel, National Conference on the Abandoned Automobile, Washington, D.C., Mar. 31, 1970, reported in *SECONDARY RAW MATERIALS*, Mar. 31, 1970, at 16.

24. MD. ANN. CODE art. 66½, § 71 (Supp. 1969).

25. 23 U.S.C. §§ 131, 136 (Supp. V, 1970).

26. Bureau of Public Roads Policy and Procedure Memorandum 20-8, 23 C.F.R. App. A (1970).

27. 44 CALIFORNIA HIGHWAYS AND PUBLIC WORKS, Mar.-Apr. 1965, at 39.

state highway departments.²⁸

On the legislative and regulatory side, recent federal legislation is aimed at protecting sites of special esthetic value, and at giving interested parties, including those with special esthetic concerns, an early opportunity to review highway proposals, at least those receiving some federal financial assistance. For instance, the National Environmental Policy Act of 1969²⁹ seeks to bring together national efforts to encourage the productive harmony between man and his natural environment, and the Council on Environmental Quality was established to improve policies and procedures to bring about this aim.³⁰ The Federal-Aid Highway Act of 1966 requires the Secretary of Transportation to assure that land for parks, recreation sites, wildlife and waterfowl refuges, and historical sites is not used for transportation purposes unless there is no feasible alternative.³¹ Moreover, the grant review process of the Demonstration Cities and Metropolitan Development Act of 1966³² together with the Intergovernmental Cooperation Act of 1968³³ give interested parties an opportunity to review federal-aid proposals which might affect the environment.

Air and Noise Pollution

The air pollution aspects of urban highway transportation first received substantial attention at the local, rather than the national level. State and federal actions followed pioneering work in Los Angeles. The Los Angeles effort was stimulated by the nuisance and discomfort effects rather than the public health effects, which, as far as automotive sources are concerned, are still largely unknown.

Subsequent state³⁴ and federal³⁵ programs limit emissions of certain chemical compounds from the exhausts of individual vehicles. They require certification of compliance with emission regulations as a condition of approval for sale. The regulations are expressed in objective, numerical terms—so many parts per million of hydrocarbons, etc. In some states inspections for compliance are on a sampling basis, with additional controls applicable when vehicles are reregistered, to assure the presence of required devices.

28. AUTOMOTIVE SAFETY FOUNDATION, *URBAN HIGHWAYS IN PERSPECTIVE* (1968).

29. 42 U.S.C. §§ 4331-47 (Supp. V, 1970).

30. Exec. Order No. 11, 472, 3 C.F.R. 122 (Comp. 1969).

31. 23 U.S.C. § 138 (Supp. V, 1970).

32. 42 U.S.C. § 3334 (Supp. V, 1970).

33. *Id.* §§ 4201-44.

34. *See, e.g.*, CAL. HEALTH & SAFETY CODE §§ 39100-12 (West Supp. 1970).

35. *See* National Emission Standards Act, 42 U.S.C. §§ 1857f-1 to -7 (Supp. V, 1970).

In recognition of the fact that air knows no political boundaries, Congress established air pollution districts so that the problem might be approached on a regional basis.³⁶

Another approach to improving the quality of air is through the improvement of the general quality of traffic flow, particularly in those corridors and at those times that automotive air pollution is most serious. Studies show that hydrocarbons, the chemicals chiefly responsible for smog, vary rather directly with the speed of traffic. Stop and go driving produces about a third more hydrocarbons than does consistent freeway driving.³⁷ Consequently the improvement of general driving conditions, whether by substantial additions to the arterial and freeway systems, or through traffic operations measures, has an environmental side benefit in terms of reduced exhaust emissions.

Most progress in air pollution control, however, will still stem largely from improvements in fuels and combustion encouraged by government regulatory actions establishing emission standards. To a lesser degree community-wide pollution can be alleviated through general traffic improvements and through more careful placement of major roads. For instance, steps are being taken to test wind currents under varying topographic conditions, permitting estimates to be made of the likely air pollution impact of roadways in different locations.

While objective standards for exhaust gas emissions are common, similar controls over noise are in their formative stages. Most state controls over noise are general and subjective. The Uniform Vehicle Code states: "Every motor vehicle shall at all times be equipped with a muffler in good working order and in constant operation to prevent excessive or unusual noise."³⁸ Such laws are enforced with varying degrees of severity, depending upon local custom. Statutory limits on motor noises will only partially quiet the highway environment. Enforcement will continue to be largely a local affair, and will receive only as much attention as can be spared from other enforcement activities of greater priority. In addition, motor noises are only part of the sound problem. Wind and tire noises are also involved and, under some circumstances, may be even more annoying.

One highway design technique which may aid in reducing noise impact is the construction of solid noise barriers immediately adjacent to the road shoulder. However, such walls must be of substantial height to be of any practical value, and their cost and appearance may mitigate against their

36. See Clean Air Act, 42 U.S.C. §§ 1857-1857f (Supp. V, 1970).

37. J. Chipman, Comparison of Auto Exhaust Emissions Freeway vs "Average-Type" Driving, July 3, 1964 (Cal. Vehicle Pollution Laboratory).

38. UNIFORM VEHICLE CODE § 12-402.

widespread use for some time. Some observers point out that it is important for the traveler to see his surroundings for both esthetic and route selection reasons. Thus, sound barriers that improve one aspect of the environment might well detract from another. Such positive environmental tools which also have negative side effects are not uncommon. Improving the environmental impact of roads frequently consists of striking an acceptable balance among competing factors.

Urban Impact

In addition to concern about the esthetic and polluting aspects of highway transportation, there is wide public support for the idea that highways be more amenable users of land and serve as more effective agents for shaping urban growth. There is a strong reaction to locating freeways largely on the basis of economic considerations, and a companion desire that all major urban roadways fit well into the urban fabric. None of these views is particularly new, and several urban highway conference reports indicate that there is agreement on these points among the highway builders.³⁹

Although such goals are generally agreed upon, the methods for achieving them are still in the formative stages. One problem is that the burden and benefits of road improvements are not distributed with absolute equity. Freeways in particular are regional facilities, serving only a limited, although important, local purpose. A well-planned freeway system comprises less than five percent of a regional road system, but will generally handle almost half of a community's traffic.⁴⁰ It provides for a particular part of the essential mobility requirements of a community. At the same time, a road occupies space, is a source of noise and exhaust emissions, and is a visual presence in the neighborhood. While those dislocated by a freeway can be compensated and enabled to relocate, others remain as neighbors to the road, and profit or suffer depending on their own tastes, the quality of the road, and the nature of the land uses.

As an occupier of space the freeway separates what once were adjacent land uses. Where the land uses were incompatible, the barrier effect of a road is an advantage. Where the land uses were closely related in purpose or where one served the other, the barrier effect must be eliminated by adequate crossings. Sometimes the road may be a psychological, rather than a physical barrier, generating a modern version of "the wrong side of the tracks."

Clearly, the road as a land use tool is likely to be most acceptable where the road builder, the citizen, and his elected representatives have a clear

39. See notes 18-20 and accompanying text, *supra*.

40. AUTOMOTIVE SAFETY FOUNDATION, FUNCTIONAL HIGHWAY CLASSIFICATION IN URBAN AREAS 6 (1967).

picture of how road and land will fit together. Congress adopted this notion by requiring that in metropolitan areas of more than 50,000 population, highway planning be part of comprehensive community planning.⁴¹

Theoretically, tying road planning to community planning is of benefit to everyone. The designers have a clear idea of exactly what traffic demands must be met by the major road systems; the planners and civic officials have a basis for recommending route location and connections to local highways. If comprehensive planning functions well, the goals and objectives of a community are put into tangible form. The physical and social characteristics the community wishes to preserve or attain are identified.

However, building a major highway is a continuing process, consuming up to ten years from the first examination of travel corridors to construction of the roadway. If funds are scarce, the period may be even longer. During that time, many community goals and objectives may change. Single events such as an urban riot can quickly reorient a community's focus of interest. Ten years ago, for instance, city officials, planners, and highway builders alike looked upon freeway construction through blighted neighborhoods as a good way to eliminate slums and acquire relatively inexpensive rights-of-way. Today, actions taken on the basis of those early decisions no longer mean slum clearance. They represent dislocation, and when there has been an absence of adequate replacement housing, they have generated substantial freeway opposition.

Indeed, the most serious social impact of urban freeways is upon those dislocated. In response to this problem, Congress enacted the Federal-Aid Highway Act of 1968, permitting excess payments over and above fair market value for property taken.⁴² Beyond this, the Department of Transportation requires that adequate replacement housing be available prior to road construction.⁴³ These federal initiatives suggest to some that state highway departments will have to get into the housing business. At least one state has done so. Recognizing the need to rehouse hundreds of residents of Watts due to freeway construction, California legislators have given the state highway department authority to provide replacement housing.⁴⁴ Other states may well follow suit.

41. See 23 U.S.C. § 134 (1964).

42. *Id.* §§ 501-11 (Supp. V, 1970).

43. "Projects of the Department of Transportation will not be approved if they involve the dislocation of people—black or white—unless and until adequate replacement has already been provided for and built." U.S. Dep't of Transportation, News Release No. 4570, Feb. 16, 1970 (quoting Secretary of Transportation John A. Volpe).

44. CAL. STREETS & HIGHWAYS CODE §§ 135.3-7 (West, 1969); CAL. HEALTH & SAFETY CODE § 37110.5 (West Supp. 1970).

Problems in the Process of Decision Making

The highway decision making process is growing more complex now that the social and environmental effects of transportation schemes are being added to the economic imperative in highway planning and design. Urban highway design teams, which bring together experts from many fields to identify the costs and benefits of road alternatives as completely as possible, help the final decision makers in highway agencies and local government to perceive the trade-offs they have to make. However, the problem of gaining regional consensus in metropolitan areas composed of many local governments still remains. In the absence of metropolitan government, the problem of arriving at acceptable regional decisions will have to rest with voluntary associations of local officials, the councils of governments, or continue to be handled by state governments, which have traditionally arbitrated regional differences.

Sensible highway decision making in metropolitan areas rests on agreement about the predominant function of every road in the area. Roads or corridors that serve the dominant land uses or the most concentrated traffic loads may require freeway status. Streets that serve only to provide access to adjacent property belong in a lower class. Identifying the service to be provided by roads helps to assign the administrative responsibilities for their financing, development, and management.

Good functional classification, and the rearrangement of administrative and financing systems that stem from it, can go far to improve highway impact. Different principles of highway location, planning, and design are related to different classes of road. Application of these principles on an orderly basis can avoid the problems apparent in older communities, where roads intended primarily to provide access to adjacent property—*e.g.*, residential streets—are used by through traffic, imposing burdens of danger, congestion, noise, and confusion, which detract from the quality of neighborhood life. Functional classification is also helpful in the correction of existing street deficiencies by identifying those streets which should be improved to handle a greater traffic load and those which should be made unattractive to through traffic.

Frustrations with urban roads will continue whenever decisions about land uses are made without adequate regard for the relationships between land uses and transportation. For example, designing a street as an arterial is only a paper exercise if unlimited driveway openings are later permitted from adjacent property. On the other hand, positive value can be gained from road development by consistent application of land use controls which make use of the inherent characteristics of high quality roads—particularly freeways.

Conclusion

In the desire to overcome negative effects of automotive transportation, it is all too easy to accentuate, rather than reduce, environmental problems. In selecting highway alternatives there is always the temptation to opt for the "no highway" alternative. While it is always appropriate to consider that possibility, in most cases the environmental costs will be high. Bad transportation is bad for the environment. Congested traffic pollutes more than uncongested traffic. Crowded streets impose a greater burden on the senses than uncrowded ones. Traffic inadequately handled on a major road system will use other roads not intended for through traffic, exacting an inordinately high accident toll.

The barriers to more satisfying urban highway development are less technical than they are governmental and legal. They will be overcome by legislative and administrative steps that simplify and clarify the job of making regional decisions in complex metropolitan areas. They will be lowered by techniques that clearly identify social and environmental costs and benefits of transportation alternatives in terms that make sense to citizens and their representatives, as well as to technicians. The thrust of federal legislation is aimed at both of these goals. The question is whether such legislation, which must be implemented at the state and local level, can keep up with the rising level of expectations of an affluent, mobile, and dissatisfied society.

From an engineer's point of view, it is clear that lawyers have a constructive role in improving the environmental effects of highways—one that begins before litigation over the environmental effects of a road. Such litigation is becoming increasingly common, of course, and will undoubtedly have its effect on those highway agencies not already sensitive to the growing concern over environmental issues. Further litigation is inevitable for some time, due to the fact that roads not yet built were planned ten or more years ago. However, it is certainly desirable that this procedure not be the basis of environmental improvements on roads we are planning now.

As the chief figure in environmental litigation, the lawyer has become one of the leading advocates of environmental improvement, both as litigant and as judge. Perhaps this is also a function of his being more "people-oriented" than those in some other professions. In his role as a leading environmental advocate, the lawyer could serve as a bridge between those whose concerns are chiefly environmental, and those who have been assigned other primary responsibilities—roadbuilding, for instance. This bridge should be constructed in the earliest stages of highway planning and development, at a time when perhaps only the broad outlines of a transportation corridor have been identified. It is at this point that it is most impor-

tant to identify the environmental conditions deserving of preservation or enhancement. It is at this point that the views of all interested parties can be brought together before concerns become conflicts. And it is certainly at this point that builders of roads, at the highest levels of authority, need to understand the legislative and judicial interest in the environment and its relation to the highway.

BARRY T. CRICKMER received his undergraduate degree at the University of Virginia and has been director of information for the American Transit Association since 1967. The American Transit Association, one of the oldest trade groups in the country, began in Boston in 1882. It was then known as the American Street Railway Association. Today the Association represents the urban transit industry, encompassing local motor bus and rail transit systems throughout the United States and Canada. The Association also includes manufacturers and suppliers of materials and services who, through their own division within the organization, discuss and act on matters affecting their interests.

In the search for reasonable alternatives to the prospect of more vehicles and more freeways, the ideal of convenient modes of mass transit still stirs hopes. Substantially improved bus and subway transit could offer a measure of immediate relief to the stifling congestion of city streets and freeways. Hence, this discussion of the urban transit industry's past, with some speculation about its federally-aided future.

Mr. Crickmer reviews the phenomenon of urban decentralization and suburban settlement of the last fifteen years. The effect of this movement on urban transit has been a severe loss of service for the public and of profits for the industry. He explains the limited provisions and inadequate appropriations of the Urban Mass Transportation Act of 1964 and then goes on to recently enacted legislation that considerably expands the scope of federal aid to the industry. Even under the new Urban Mass Transportation Assistance Act of 1970, however, federal assistance is limited largely to financing capital facilities and equipment. Aid in the form of operating subsidies remains an unexplored route to more efficient urban transit.