

THE TEN MOST CRITICAL ISSUES IN TRANSPORTATION

A 1978 Update

In 1976 the TRB Executive Committee established a list of the Ten Most Critical Issues in Transportation that was published in the November-December 1976 issue of *Transportation Research News*. It was recognized then that the list, to be useful, would have to be brought up to date from time to time, and this has been undertaken this year. The development of the 1978 list involved suggestions and ranking by TRB's group council members and committee chairmen and final ranking by the Executive Committee.

As in the previous list, some of the issues are such that the approach to their resolution rests in research. These are in the province of the Transportation Research Board. Where work on these issues is not under way, it should be initiated and encouraged.

Other issues involve policy that is established or changed through the political process or by transportation administrators. While TRB does not recommend policy, it is increasingly involved as a neutral forum for the dissemination of the results of research into policy-related problems and alternatives and for the illumination of all sides of policy issues.

Again this year, the procedure used in selecting and rating issues has brought to the top those issues considered most critical to those in all facets of and roles in transportation. There are still problems that are serious to the transportation specialists, and they will continue to receive attention. The ranking procedure will also allow an analysis of how those in each of

TRB's four subject-related groups rank the critical issues, first as transportation professionals and second from the viewpoint of their own specialized responsibilities. The results of this analysis will be published in a later issue of *Transportation Research News*.

The TRB Executive Committee's list of critical issues is only one of a number of recent studies along this line. Others include a U.S. General Accounting Office study report, *Transportation Issues* (CED-78-159, Oct. 10, 1978), and the more general Office of Technology Assessment Priority List published in the October 1, 1978, *Science & Government Report*, which includes several transportation and transportation-related issues.

The TRB list that follows is not in order of priority.

Need for Specific, Measurable, and Attainable Transportation Goals at the National Level

During its transportation history, the nation has gone through periods of unified attitudes toward the development of transportation systems. In the past there was general support for the development of waterways, railroads, aviation, and private regulated transit systems. The nation and states made major efforts in developing 6.1 million km (3.8 million miles) of roads and streets and getting the nation "out of the mud."

The past half-century has seen the completion of these systems and a growing realization that transportation is not an unmixed blessing. Public concern has been re-

flected in regulation to control transportation systems in areas such as environmental pollution, safety, fuel economy, fares, levels of service, service abandonment, and the competitive and labor practices of industry. Major segments of the transit and rail industries have been experiencing declines in passenger and freight demand. At the same time, political pressure has been brought to bear to maintain and expand transportation services for the poor and otherwise disadvantaged. There has been growing public reaction against further growth of transportation systems, especially in urban areas, and against the continuing increase in public expenditures for transportation. Past common goals for transportation are no longer accepted. There is now a multiplicity of often conflicting goals and values.

In order to plan for future transportation systems and to allocate current scarce resources among the existing transportation systems' needs for construction, operation, and maintenance, a thorough review is needed of national, state, and local goals for transportation. A number of studies have been completed and some are currently under way on national transportation policy.

Too often, studies of goals have failed to look at personal motivation and expectations as the ultimate basis for resource allocation and have allocated public funds for programs that may be quite contrary to public aspirations.

A thorough study of the attitude of the general public and its goals for transportation is needed. Such a study must not only identify and weigh the public's attitudes toward transportation but must also compare them with other personal and public goals and aspirations.

Intergovernmental Responsibility for Transportation Systems

The roles and responsibilities of federal, state, and local governments for all modes of transportation continue to undergo major reevaluation. The appropriate roles and functions of each government level in funding, construction, management, regulation, and control need to be examined. Highways, air, rail, waterways, urban transit, rural transportation, environment, land use control, and energy are of interest to all levels of government. Responsibility for the planning and implementation of transportation programs is still not well defined and must be clarified before there is assurance that transportation policy and plans can be implemented.

One of the most significant factors affecting the quality of areawide transportation systems is the nature of institutional arrangements for delivering transportation services. In many areas, the patterns of transportation service delivery and the assorted geographic, fiscal, labor, and regulatory constraints contribute to service gaps so that transfers from one mode to another are often more difficult, time consuming, and costly than necessary. In other areas, innovative solutions to transportation problems stem from measures of reducing or changing travel demand. In addition, although proposed

programs may promise real benefits to the community, the costs and benefits may be distributed unevenly among private and governmental participants, causing some necessary institutions to be unwilling to participate.

These problems raise the questions of who should be the lead agency and whether metropolitan areas and other regions need areawide institutions to coordinate and fill gaps in the broad spectrum of transportation services. Furthermore, the regulatory roles of federal, state, and local governments should be made more compatible with one another so that the complexity of some regulatory systems will be reduced and different regulatory systems affecting transportation will be better coordinated to prevent disruption of the orderly development of total transportation systems. Finally, a greater clarification of labor work rules, union participation, and their impacts on transportation is essential.

Financing Transportation and the Equitable Allocation of Resources

This issue is a combination of several topics related to the financing of transportation systems and the allocation of limited resources. Inflation and requirements for motor vehicle fuel efficiency are seriously eroding the purchasing power of road-user revenues earmarked for transportation. Maintenance and recapitalization of transportation facilities have not kept pace with the demand for services. Highways are experiencing a continued growth in vehicle-kilometers of travel while public transportation systems continue to experience difficulty in attracting patronage and require ever greater government subsidy to continue operations.

Some of the specific questions that need resolution in developing new sources of revenue are How should multimodal needs and priorities be defined within given resources? To what extent should capital, maintenance, and operating costs be borne by users? What are the appropriate roles and funding responsibilities of federal, state, and local governments? How can an inflation-resistant funding basis be provided? How should transportation services be priced?

As government assumes greater responsibility for operation and control of public transportation and freight services, the pricing structure and the cross-modal impacts of different regulations and subsidies also become increasingly important.

Effects of Transportation Regulation

Economic and safety regulations of transportation entail a number of costs and benefits. These include effects on fares and rates, efficiency and costs of operation, rate of technological innovation, profitability of unregulated competitors, level and extent of service provided (for example, in rural areas), and even the availability of railroad boxcars.

Analyses of modal patterns involving regulated and nonregulated carriers and of the cross-modal cost im-

pacts of economic regulation are needed. Alternatives to deregulation or regulatory reform should be identified and an assessment should be made of their potential impacts. In addition, information on the costs and benefits of safety regulation is needed. Differences between safety requirements for common carriers and those for private carriers should be examined.

Performance Criteria and Design Standards for Transportation Systems

Design standards for modal transportation systems have been developed empirically over time; there have been changes in response to such influences of the moment as beautification, economy, safety, preservation, conservation, and environmental protection. Performance criteria for modal systems have often been clouded by political, economic, and societal considerations, so that objective evaluations of changes have not been possible. Performance criteria for multimodal transportation systems are practically nonexistent, in large measure because of the lack of practical goals for such systems. Clearly, design standards and performance criteria by which change can be evaluated must follow the adoption of practical policies and goals for transportation systems at every level of government.

Needed are performance criteria by which operating characteristics can be prescribed and by which such variables as time, cost, energy, quality of service, pollution, land use, and safety can be related. Such criteria are needed not only for each mode of transportation but also for multimodal transportation systems. Only through analytical processes in which these performance criteria are considered in evaluating alternatives can administrators make rational choices among design standards and the many options for capital expenditures.

Improved Utilization of Existing Facilities

The development of the existing U.S. transportation system has proceeded through the years with little delay other than that imposed by financial constraints. However, today and in the future, development will be constrained not only by economics but also by desires to reduce congestion, pollution, fuel consumption, land use, and hazard. Management practices in the existing systems frequently fail to achieve optimum conditions and, in fact, often may contribute to delay, fuel waste, increased pollution, and frustration.

While technology in the handling of people, services, and goods can and should be further improved through research, much greater levels of improvement might be achieved by overcoming barriers to better application of existing technology. These barriers are social, economic, political, and institutional. Much is known about them and their causes, but effective mechanisms for overcoming them are lacking. Similarly, all sorts of schemes for managing demand, such as ride sharing, flexible work hours and days, freeway access and use limitations, and corri-

dor management and control, are underutilized for a variety of reasons.

As more attention is inevitably given to desirable constraints on new capital improvements and as resources dwindle, it becomes more and more important to develop the mechanisms to overcome the barriers that inhibit implementation of the technology essential to improved utilization of existing systems.

Transportation System Maintenance Technology and Management

The U.S. transportation system is now essentially in place; there appears to be a rapid deterioration of the existing plant in all modes—in some more than in others—but no firm commitment to upgrading. Fully effective management of the revenues allocated to maintenance is not now being attained. The key decisions on how much maintenance is enough are being made on the basis of subjective judgement. That our transportation system is rapidly deteriorating is widely accepted, but the rate of deterioration and the actual existing level have not been established by a well-conceived and well-executed measurement process. These facilities eventually need to be rehabilitated, but proper maintenance increases the life of facilities. A program for improving maintenance and increasing maintenance funds is needed.

A number of related issues are involved: (a) A way must be sought to locate and isolate points of weakness and provide measures to prevent or ameliorate distress prior to breakdown. (b) As highway agencies concentrate their reduced revenues on maintenance, it becomes critical that service-level decisions be made on the basis of objective criteria, which do not currently exist; until sufficient attention is committed to their development, opportunities for making maximum use of reduced highway revenues will continue to be missed. (c) Our vast street, highway, airport, railroad, and waterway systems must be maintained to properly and efficiently serve their purpose; funding levels between and within modes, funding management, and maintenance services must be studied to develop the best possible methods for keeping the present systems operable. Research into better methods and materials, traffic handling, financing, administration, and preventive maintenance is also needed.

Viability of U.S. Railroads

Because of the low rate of return on investment, the railroad industry is faced with increasing difficulty in raising capital. Even railroads in the best financial condition are forced to forgo many opportunities that could improve their return on investment. Less profitable railroads have been forced to defer maintenance of plant and equipment, which has led to deterioration of service.

Research is needed to improve operating methods for better service to shippers and to lower transportation costs, as well as to improve technology to reduce the cost of maintenance and the number of derailments.

Greater productivity is needed to compete with other modes. There is also a need for revised regulatory procedures to permit improved return on investment and flexibility in pricing to alleviate periodic freight-car shortages.

Because of the need to conserve petroleum, protect the environment, and minimize construction of new facilities, the railroad system must provide a large part of the country's transportation. Unless profitability of railroads can be improved, the issue of nationalization will inevitably have to be faced. Unless the present trend is altered, the only alternative to nationalization may be abandonment.

Interrelationship of Energy, Land Use, and Transportation

One of the great needs today is to conserve energy in the face of uncoordinated development of land and transportation facilities. Transportation facilities continue to be planned, built, and operated in isolation from associated land development and from other modes of transportation. To conserve energy, activities and transportation that serves the area of the activities need to be coordinated. For example, the development of metropolitan areas to encourage people to live closer to their employment could save energy that is now being used for commuting.

In spite of this need, land development goes forward without adequate consideration of whether existing or planned transportation is adequate or whether the development is suited for areas of high potential that are near or served by transportation facilities. Control of land use, which could relate development to transporta-

tion in order to minimize energy or environmental costs, varies widely but has seldom been able to achieve appropriate development in areas well served by transportation.

In addition to the pressing need to coordinate transportation and land development, this matter warrants attention because realistic coordination is apparently becoming more feasible. Much has been learned about transportation and land development relationships, and this knowledge can be focused on current needs. For example, efforts to fully integrate land use and transportation forecasting models are becoming feasible, at least at the sketch-planning level of detail. New transportation planning processes are emerging that are characterized as short-range, incremental, politically open, and multioptioned in narrowing but not eliminating choice. Finally, the climate seems right, since citizens' groups are demanding involvement and improvement in the way transportation and other services are provided.

Conservation of Energy Resources and Development of Alternate Energy Sources for Transportation

As petroleum reserves diminish and the percentage of our national needs supplied by imports increases, it becomes increasingly important that the best use be made of these fuels and that new sources of energy for transportation be developed. Research should concentrate on improving the efficiency and utilization of transportation systems; on determining the impact of energy conservation on society, including the transportation systems themselves; and on developing alternate sources of energy for transportation.