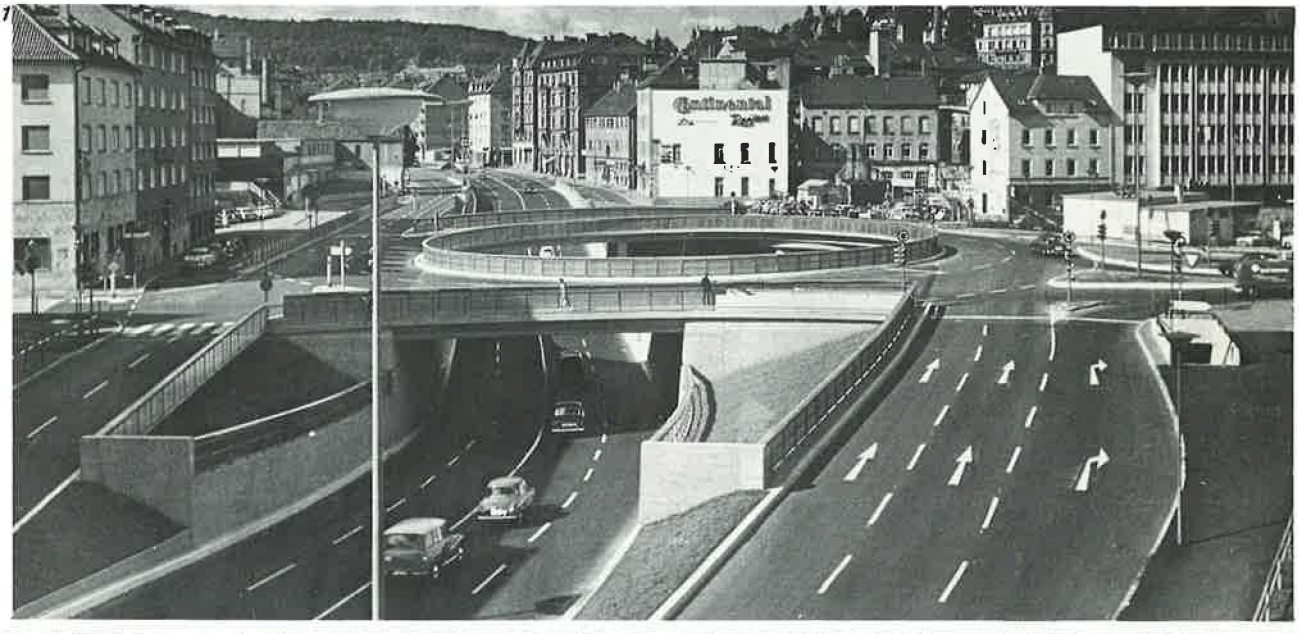
ENVIRONMENT AND THE TRANSPORTATION PROFESSION:
The Issues and Their Implications

C. Kenneth Orski

No one who travels extensively these days can fail to be impressed by the tremendous improvement that has occurred during the past quarter century in the level and quality of transport service. A dense network of waterways, rail lines, air routes, roads, and superhighways covers Europe from the northernmost reaches of Scandinavia to the shores of the Mediterranean. Virtually every spot is linked with every other one, and the individual traveler and shipper has a wide range of transport means to choose from according to particular needs. The economic advantage that once only a handful of locations

1 Multilevel intersection in Stuttgart, Germany.
2 Six-lane freeway, connecting London with its airport, crosses main railroad tracks and bisects residential district in West London.

1



2

enjoyed by virtue of their superior accessibility has now been nearly erased. Today, a business firm seeking a new location has a choice of literally thousands of acceptable sites. It can select among regions, among metropolitan and nonmetropolitan locations within each region, and among diverse sites within each urban area. For many firms the Ruhr or the Randstad may no longer offer a significant geographic advantage over the Piedmont or the Midlands. Europe has truly become welded by its transportation lines into one integrated marketplace.

What I am suggesting is that the century-old task of building Europe's transportation system is virtually accomplished. To be sure, there are still large uncompleted stretches in the motorway network. There is scope for improving air connections between smaller cities. And I suppose there are still some regions in Europe that by today's standards could be considered as inaccessible. But all these unfinished tasks represent by and large marginal improvements to the existing system. The basic job of providing Europe with a transport network is essentially completed.

And so, as we approach the realization of the age-old dream of abolishing geographic isolation, our priorities in transportation are changing. The initial challenge was to make all places accessible to all others with the aim of promoting economic growth and providing opportunity for regional development. With this goal substantially achieved, our attention is shifting to other objectives. One of the new objectives is to meet the rising expectations of the transport user for a higher standard of service: greater convenience, higher speeds, more comfortable journeys. Another objective is to spread the benefits of modern transport more widely—to make them available to those who do not yet enjoy them. A third objective is to try to reconcile the public demand for ever greater mobility and transport convenience with the dual constraints of diminishing land and energy resources and of heightened environmental and social concerns.

This third objective in particular has come of late to dominate our thinking about transportation. Conservation of energy, reduction of pollution and noise, preservation of the country side, protection of ecologically fragile areas—all that which has loosely come to be called environmental concerns—not only have become a subject of serious research within the academic community but also enter increasingly into the calculations of practicing transport planners, designers, administrators, and political decision-makers.

The subjects of the Symposium on the Environment and Transport Technology—new technology, traffic management, propulsion systems—are in themselves old and familiar themes. What is new—and what distinguished this symposium from similar gatherings held 10 or even 5 years ago—is the manner is which the new transport developments were appraised. Gone was the emphasis on capital costs, profitability, engineering efficiency, and user benefits. Attention was focused instead on those effects of transport technologies that are likely to impinge on the wider public: the external effects.

This new emphasis merely reflects the changing ground rules under which present-day transport decisions are being reached. Let me indicate more precisely what I mean by the changing ground rules and discuss some of their implications for the transport profession.

Who Is To Pay And Who Is To Benefit?

In the past, when the construction of a new airport or highway or transit system was considered, alternative sites or routes were evaluated solely in terms of the anticipated benefits to operators and users of the facility, such as increased passenger and freight capacity, reduced travel and shipping time, and relief of congestion. In other words, the project was appraised only against criteria that were internal to the transport system itself.

We now have come to realize that this is an incomplete way to view a public investment and that equally as improtant as the transport-specific impacts are the impacts of the proposed airport, highway, or transit project on the larger system to which it belongs. The accepted practice has become, therefore, to try to anticipate the effects of location decisions on a host of external factors: on future land development around the facility; on the likelihood of attracting new industry and creating new demand for labor in the area; on the levels of noise, pollution, and traffic congestion in the communities neighboring the facility; on the increased burden on local public services such as electric power and sewage disposal; on the degree of displacement and relocation assistance required; on the desired economic development of the region; and on the possible destruction of irretrievable resources such as historic monuments, farmland, wildlife refuges, and open spaces.

The heightened awareness of the external effects of transportation decisions has subtly modified the way in which we assess transport effectiveness. Today the best design for a transportation system is no longer necessarily the one that results in the lowest capital costs or in lower user costs or the one that produces the biggest reduction in travel time. Rather, it is that design that yields the highest social return on the investment and reconciles most effectively the conflicting interests of the various groups and interests affected by the proposed project. The cardinal objective for the planner and designer, therefore, is no longer the achievement of maximum functional efficiency but the achievement of a community consensus on a course of action that respects the interests of users and nonusers alike.

The new ground rules pose a difficult challenge to the professional. He is no longer free, as in the past, simply to identify a few technically promising alternatives, assess their costs and relative user benefits, and recommend a course of action. This model of the professional working in splendid isolation is no longer accepted by large segments of the public as a basis for reaching decisions about large-scale public projects. Today the planner must formulate a much broader range of alternatives, including the option of not constructing the new

facility at all. He or she must then identify all the social, economic, and environmental effects of such alternatives that any particular segment of the public thinks are significant, whether or not these effects are readily quantifiable and ensure that the public has a full opportunity for involvement so that every potentially affected group has an opportunity to air its views.

The planner will also encounter greater problems of evaluation. Some environmental impacts, such as energy consumption, are readily quantifiable, but many other external effects are not. What value can be assigned, for example, to the consequences of severing a community by a motorway? What is the cost of a life wiped out in a highway crash or of reduced life expectancy due to polluted air? What kind of value system does one employ to describe the destruction of an old church or wildlife refuge by a new airport? These questions are not new and have been asked again and again. What is new is the demand of the general public and the lawmakers to integrate these unquantifiable effects of transportation into the decision-making process. This casts the transportation professional in a new and unfamiliar role for which he or she is often ill-prepared—that of a social advocate. For even if monetary or other objective values could be assigned to the external impacts of transport decisions, there would still remain the question of the ethical justification for imposing serious hardship on an unwilling minority for the benefit of a much larger majority. In an admirable essay, Buchanan (1), commenting on the Greater London Council motorway plan, stated the dilemma in these words:

> What are the ethics of asking, indeed compelling, 30,000 people to render a serious sacrifice for the benefit of the other seven and a half million? This is the question which nags at the back of my mind. I have no real doubts about the need for the motorways nor about the economic and environmental benefits they could be made to yield.... But I am not clear about the morality of achieving these gains for the majority at the expense of a minority which may be very small in relation to the total population but is nevertheless a sizeable number of people. We do our cost-benefit analyses in hard economic terms, but it seems to me that there is some kind of ethical cost-benefit analysis which has escaped attention so far.

One could go on with other illustrations of this dilemma. What is the justification for exposing the residents of a community adjoining an airport to serious annoyance for the benefit of air travelers from distant places? What are the ethics of disrupting an urban neighborhood by an expressway so that affluent suburbanites may commute in greater comfort and at higher speeds to their downtown offices? The traditional response has been that one should try to discern where "the public interest" really lies. But more often than not, the public interest was identified as the interest of the majority, so that the problem really begged the question.

In these days of increasing pluralism and sharpened sensitivity to the rights of minorities, we have come to acknowledge that there is no overriding public interest but rather a multiplicity of communities of interest: the interests of the user, of the transport operator, of those directly exposed to the undesirable effects, of the community at large, and perhaps of the generations yet unborn. Each of these publics has its own set of values, preferences, and ideas as to how the benefits should be paid for and distributed. Each of them demands a different allocation of benefits and costs, a different distribution of equities.

And so, however foreign to their nature and training they may find their role, transportation analysts and planners cannot avoid being cast as political actors. For in this field, abounding as it does with competing interests and conflicting objectives, there are no technically correct solutions, only politically viable solutions. The job of the transportation professional is of necessity one of an interpreter and moderator of the demands of many publics, a referee in a settlement dispute, an advocate in a court of equity. He or she must assess the differential benefits and hardships of each alternative decision, identify the diverse groups on whom these differential impacts will fall, examine ways in which those adversely affected can be compensated, and in general assist in the process of negotiations that always precede the achievement of any effective political compromise. Of course, as Webber (2) put it so well:

> Those sorts of analyses and informational contributions cannot be politically neutral. Inevitably whenever the analyst must

C. Kenneth Orski

The author is Associate Administrator, Office of Program Planning, Urban Mass Transportation Administration, Washington, D.C. The paper was delivered at the Symposium on the Environment and Transport Technology, Loughborough University, England, in September 1973. The views expressed in the paper are those of the author and do not necessarily represent the official policy or position of TRB or of the Organisation of Economic Co-operation and Development with whom the author was affiliated when this paper was prepared.

select data or interpretations he adds to the debate, and if they prove useful he affects the outcome of the debate. He thus aids one group at the expense of others. However dispassionate he might be, however disinterested in the outcome, insofar as he informs the debate he fosters one set of distributional consequences over potential others. This is to say, every technical analysis is inherently political in character.

This is a far cry from the lofty concept of the transportation planner as a grand social accountant who, with the help of benefit-cost balance sheet techniques, determines what is "in the best public interest." But it is a role that planners must be prepared increasingly to assume and that, in the end, is perhaps the only role that in this diverse and pluralistic society of ours they can usefully play.

Elevated structure and tunnels on the autostrada between Bologna and Florence, Italy.

Revolt Against Unconstrained Growth

Historically, transportation planning has been based largely on stimulation or accommodation of transport demand. The need for new transport facilities would often be justified by extrapolating prevailing trends in the growth of traffic and by equating these projections with future transport demand. New facilities built in anticipation of this demand would inevitably attract additional users, quickly become saturated, and thus provide justification for yet another round of expansion.

This orientation, dominated by a narrow conception of transport demand, was justified in the days when an expanding transportation system was necessary to fuel economic growth. Today, in a more mature economy, this approach may no longer be consonant with our needs.

In a brilliant essay published a few months ago, Illich (3) argued that transportation, far from giving man increased freedom, has in fact enslaved him through "enforced mobility." He pleaded for a new era of technological maturity in which society would come to dominate transport rather than, as today, be dominated by it.

With Illich and other observers, I am inclined to believe that our drive for ever-rising speed and mobility is being sustained at a growing social cost. Each addition to the capacity of the transport system and each increase in speed add to the strain on energy resources,

take away valuable land, increase the burden of pollution and noise, and introduce additional disturbance into the lives of people. Until recently these costs were deemed an acceptable price to pay for the vast economic, social, and personal benefits derived from transport investment—and so the growth of transportation facilities was constrained only by the ability to pay.

Today this attitude is changing. In a large number of cities on both sides of the Atlantic, plans to build or to expand networks of expressway have collapsed under the pressure of citizen protest or else are hopelessly mired in court battles and inquiries. Plans for new airports meet with increasingly vocal opposition from local communities, forcing airport authorities to look for sites at a growing distance from metropolitan areas. Even transit proposals have begun to meet with public opposition on social and environmental grounds. In a recent referendum, the citizens of Zurich voted down a proposition to equip the city with an extensive network of underground lines. A similar debate is under way in Amsterdam.

I cite these initiatives not necessarily to endorse them but to call attention to the rapid shift in public attitudes underlying them. They reflect a rising recognition of the adverse consequences of unconstrained growth and a new will to control and channel the forces of growth. They are part of the same mood that has caused Sweden and Japan to deflect further industrial expansion and urbanization in some parts of the country and that has made many communities in the United States enact measures intended to freeze or restrain further development.

I think we would be ill-advised to ignore these trends or to dismiss them as a passing fad. They represent in my view a fundamental shift in attitudes and values; they signal the onset of what Ruckelshaus (4) has called "an environmental civilization" in which the relentless emphasis on growth rates will be tempered by a growing concern for the fragile environment, by a new deference to the limits to natural resources, and by a selfish desire to improve the quality of our own lives.

For transportation planning, this new climate of opinion has 2 important implications. The first is that the null alternative—the option of not doing anything—deserves to be given equal weight with other alternatives. Supporting data for the null alternative should be developed to a level of detail consistent with that for other choices so that the option of doing nothing can serve as a reference point for comparing the adverse and beneficial effects of other proposals.

The second implication is that sometimes it will be preferable to think small rather than big: to concentrate, in the words of Rippon (5), on making the best use possible of what we already have rather than always to rely on new facilities for meeting future transport needs.

The situation confronting us in the field of airport planning serves to illustrate the point. The traditional response of airport authorities to the seemingly insatiable appetite for air transport service has been to plan bigger airport complexes. When acceptable sites to accommodate such airports could no longer be found within easy reach of the cities, the response has been to go farther away. But the basic premise—the need for a new airport—was hardly ever questioned. This is now changing. In metropolitan regions where sites for new airports can simply no longer be found, airport authorities are learning how to better manage and increase the capacity of what they already have. In addition to building parallel runways and expanding terminal capacity, they are exploring alternatives such as decentralizing airport operations by shifting certain aviation activities to secondary airports, imposing operation quotas on airlines, encouraging the use of high-capacity aircraft, and spreading aircraft movements more evenly throughout the day. These and similar measures may give airports the needed respite until technological breakthroughs in the development of quiet, more flexible aircraft create conditions for entirely new concepts in air service based on decentralized operations that may permanently relieve pressure from the existing large airports.

Conclusion

I have tried to draw attention to 2 central environmentally based issues that I believe will dominate overall transport policy in the years ahead. The first issue is that of equity: Who pays and who benefits from transport development? How are the competing interests of the various groups to be reconciled? How can an effective community consensus be reached on a course of action that is workable, fair, and desirable? The other issue is that of transport growth: What yardstick are we to use to assess future transport demand? How can we strike a balance between the protection of the environment and the public demand for ever greater mobility and transport convenience and the twin constraints of diminishing resources?

How sensitively the transport profession responds to these issues may determine whether it retains the confidence of the public and continues to play a constructive role in the shaping of public decisions about transportation.

References

1. Buchanan, C. The Price of Posterity. British Road Federation, London, 1972; see also, Note of Dissent by Colin Buchanan, Report of the Commission on the Third London Airport, London, Dec. 1970.
2. Webber, M. Social Contexts of Transportation and Communication. Paper presented at Conference on Multidisciplinary Education in Transportation, Univ. of Pennsylvania, Sept. 8, 1973.
3. Illich, I. Energie et Equité. Editions du Seuil, 1973.
4. Ruckelshaus, W. D. A Prototype of Environmental Civilization. Address to Comstock Club, Oct. 17, 1972.
5. Rippon, G. The Interdependence of Transport and the Environment. Speech delivered at meeting of European League for Economic Cooperation, May 15, 1973.