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ON THE TECHNICS AND POLITICS OF TRANSPORT PLANNING

We are in the midst of a spectacular shift in officials' conceptions of the transportation planning mission. After having been through an extensive and rich learning experience over several decades and having finally accumulated a high level of technical sophistication in transportation planning, responsible governmental officials are now saying there can be no technically correct solutions to transport problems. More than that: they are saying that the acceptable answers are only those that have been derived politically, only those that result from open bargaining among contesting publics. That must be one of the more notable commentaries of our time.

One cannot know how far they'd be willing to extend that line of thinking, of course. I recognize that a few might be saying only that tacit involvement of citizen groups is a means of legitimizing what technicians know best and have been doing all along -- that citizen participation is a way of laundering engineers' plans that might otherwise appear to be soiled. Others may be saying that even nonprofessionals may have useful ideas; and so, by opening the design process to open discussion, something useful might be contributed. Some may be saying that only by opening the design processes to politics can the right answers be found. Still others may be saying that there are no right answers, that there are only the outcomes of political contest.

For those of you who find that latter position to be an exaggerated point of view, I shall want to argue its defense -- to contend that, in an open and pluralistic society, there can be no right answers, no correct solutions to problems. For those who find it a truism, I shall want to defend the technical expertise that no lay group of vocal advocates can command. My thesis will hold that these positions are basically sound. Our task is then to find the right modulation among the technics and the politics that underlie transport-improvement decisions.

I. Three Approaches to Betterment

During the past decade or so, America has been home to three actively competing and fashionable lines of thought, each with its own approach to social betterment. One, system analysis and systems engineering, relies upon technical expertise. The second, market-type arrangements, rely upon the autonomous social processes through which individuals and groups make choices among alternative goods and bads. The third, citizen protest and citizen participation, relies upon the voiced expression of collective choices under conditions where other means are unavailable.

1) Advertized under such names as "systems analysis," "systems design," and "systems engineering," this approach reached its heyday at the peak of the space program where it had achieved rather dramatic success. Very complicated machines and related gear had to be invented, designed, and built on a short time-schedule, and all under central direction and control. The success of Apollo leaves no doubt about the utility of the systems approach in space technology and similar fields.

In the next stage of its development, the systems approach was to apply its methods to social problems. Anticipating the maturation of social science, systems analysts hoped to marry social science with natural science and engineering, and then expected the imminent birth of something akin to social engineering. During the 'sixties when the nation was being plagued by social problems of many sorts, it was thought that we needed only to reassign systems engineers from their space missions to missions focused on problems of crime, poverty, broken families, drug use, underachievement, and so on. If knowledgeable systems engineers could but bring their effective apparatus to bear, we could solve social problems that had seemed insoluble to less-sophisticated folk. Many practitioners of the faith expressed full confidence that virtually all social problems could eventually be made to yield before the application of systemic diagnosis, simulation modelling, and reasoned redesign. The methods of science, when merged with those of engineering and then turned upon the problems of societies, would prove as effective as they'd been when directed to the intricacies of atoms and nuclear power or the complexities of chromosomes and rice. The technological capabilities, that could trigger a green revolution and put a man on the moon, would, if only we willed it so, get us to the airport, too. You've all heard the litany.

2) The second style that has been gaining popularity in recent years stems from two origins, both of which view social systems as self-organizing, self-regulating, and self-correcting. In direct contrast with the systems engineers, who see themselves as the potential designers of these systems, men of this persuasion seek to minimize the roles of central decision makers. They aim to disperse

decision making among the millions of individuals who comprise the society, and thereby to retain the autonomous processes that initially created social organization.

Much of the theoretic basis for this strategy derives from classical economic and political thought, which understands markets and political forums to be the media through which individuals and groups make known their preferences, through which suppliers respond to shifting demands, and through which societal development is autonomously regulated and directed. In such a setting, the customer is always right, and the suppliers' task is to respond to the customers' wishes by furnishing goods and services in the mixes and volumes the consumers demand. According to the classical theory, only individuals can know what's right for them. Although professionals of various sorts have been trying to improve on the individual's private calculus of good and bad, and although each of the professions proclaims its own brand of service as just the thing to cure the customers' ills, in fact none of them has yet found a tenable substitute for each person's individual assessment of his own betterment.

The other source of this second strategy derives from General Systems theory, which has emerged in recent years as explanation of the ways in which open systems organize and maintain themselves. Social systems are of this sort. They evolved over time without the help of systems-engineers, and yet they are probably the most complex and intricately organized systems that exist. They have emerged complete with feed-back circuits that transmit information on outputs back into the input regulators; they have error-detecting and error-correcting processes built-in; and they seem capable of dealing with

many problems far more effectively "on their own" than would-be social engineers are able to. This ecologic perspective would seem to reinforce the more traditional economic perspective, thus fostering a search for ways of making the social systems more nearly autonomous.

The governing strategies that follow turn to indirect efforts to induce suppliers to serve their potential customers. The early Soviet economists tried to design the economy in detail -- to compute amounts of every product required and then to assign production quotas to each plant. American practice in contrast has relied upon markets to transmit messages from consumers to producers, then letting that interaction determine quotas. American governments have been less inclined to go into the supply businesses directly than have, say, the governments of Northern Europe. For example, recall that when all these nations faced post-War housing shortages, the other governments created huge government house-construction agencies, while the Americans installed a mortgage-insurance scheme that induced huge amounts of bank credit and thus generated a huge building industry. Post-Keynesian economic stabilization policies have turned most governments to such indirect interventions -- to monetary and fiscal means of subtly regulating the economy, leaving micro decisions on production quotas for specific commodities to decentralized, typically nongovernmental agencies and to individual persons.

Not all our public interventions have been so indirect, of course. Unlike their tactic in housing, American governments have become the major suppliers -- usually the sole suppliers -- of such goods and services as education, water, highways, libraries, fire-fighting, and police protection. In recent years consumers of these

commodities have been complaining bitterly about them charging that they are not of the kinds or qualities they prefer. But, under conditions of public monopoly, the consumers have had nowhere to turn for competitors' products. Being unable to abandon the governmentally supplied services, they have turned instead to public protest. As Albert O. Hirschmann would put it, with no means of "exit," and with eroded loyalty, they have had to voice their dissatisfactions.¹

Because standardized government services are sure to displease some consumers, the promoters of the second style of thought I refer to would treat services like education and highways in a manner rather like that accorded housing and investment credit. Rather than permitting professionals or systems engineers in government to decide how much of what should be produced, they would seek to permit individual consumers to make those decisions. And so we've been hearing of schemes like those for education vouchers that would diversify education by privatizing it. Instead of supplying standardized education services, governments would instead supply tuition fees to be used wherever individuals themselves choose. Similar schemes would remove the sole vestige of government-produced housing by supplying low-income renters with rent money, thus permitting them to choose private houses and locations that match their personal preferences, rather than those of public-housing architects. And further, the several income-maintenance schemes would have similar effects. Whether via the negative-income-tax route suggested by Milton Friedman or via

¹Albert O. Hirschman, Exit, Voice, and Loyalty: Response to Decline in Firms, Organizations and States (Cambridge, Massachusetts: Harvard University Press, 1970). See also Robert A. Levine, Public Planning: Failure and Redirection (New York: Basic Books, Inc., 1972).

President Nixon's Family Assistance Plan, the aim is to remove the income-redistributional role of governmentally supplied services. There would follow then the prospect of reprivity and pricing of some public services and the differentiation of the types and qualities of services thus provided. In these ways, the self-managing capabilities of economic markets and political forums would be exploited, permitting individual rationality to be reasserted over the collective rationality of governmental service agencies. In these ways too, citizens would be able to participate directly in their efforts at betterment; and they would do so in their roles as individual consumers in the economy and as individual citizens in the polity.²

3) The third style that became popular during the 'sixties is the mode of social protest. One of its underlying images sees societies as the arenas where competitive groups wrestle with each other for advantage. Groups defined by race, age, ethnicity, social class, location, income, or some substantive interests are seen as inevitably in competition with other groups. Gains accrued by one mean losses to another. Because conflicts among intergroup values may be irreconcilable, what is a good for one may be an ill for others. In such a setting, systems engineering and analogies with rocket ships sound nonsensical. The laws of the jungle seem more appropriate than the laws of mechanics. Indeed, many did turn away from notions of rational planning to something rather like jungle warfare, with the rival tribes

²This position is discussed further in Melvin M. Webber, "Alternative Styles for Citizen Participation in Transport Planning," Highway Research Record: No. 356: Social, Economic, and Environmental Factors of Transportation (Washington, D.C., Highway Research Board, National Academy of Science, 1971).

fighting it out on university campuses, city streets, and other urban environments.

It is well to remember that prior to the 1960's, the dominant image in America was of Progress fulfilled. Post-War prosperity was combined with massive construction of new roads, new schools, suburban houses, and the rest, carrying the promise that soon every American would have the chicken, the pot, and the two cars he'd previously been promised. Sociologists and journalists of the 1950's were decrying the imminence of a mass society -- the homogenization that the suburbs were going to impose upon us. The major problem of the nation, it was said, was the hazard of becoming a smug, happy, affluent, undifferentiated mass. With the arrival of the 1960's the rosy images and the simple problems were quickly displaced. We suddenly woke up to find we are an extremely heterogeneous nation, comprising a multitude of special interest groups and culturally defined minority groups. Just the opposite of the mass society.

First, we discovered poverty. That was about 1962. To our surprise, it turned out that something on the order of a fifth of the nation was living under conditions generally judged to be "substandard." Then the peak of the Negro revolt, the Civil Rights Movement, the student revolt, the anti-war demonstrations, and a wave of public protest against environmental pollution and against major public works all broke upon the continent in epidemic proportions. Long-suppressed dissatisfactions were suddenly given voice, and literally millions of once-silent Americans -- lower class and middle-class alike -- cried out in public protest against one or another condition they disliked.

The protests proved remarkably effective. Governments responded with all manner of programs aimed at alleviating the disfavored conditions. Major Congressional acts and major court decisions clarified disputed legalities and proclaimed previously disputed or denied rights. Reforms of many sorts were inaugurated in universities, lunch counters, employment and personnel offices. New agencies of government were formed, placed under the control of professional reformers, and charged with correcting the social and environmental circumstances that had provoked the initial uprisings.

The effect of governmental acquiescence was first to quell the civic disorders, diverting energies into what was hoped to be constructive and creative activities. I have no doubt the OEO, Model Cities, EPA and the rest have accomplished significant works. But I have no doubt either that, if the grand accounting were to be done, the score of successes would not nearly approximate, and thus cancel, the hurts that triggered the initial protests. The most dramatic effects, I believe, were first to damp the furies and then to institutionalize citizen protest as a legitimate mode of behavior.

Groups that had previously been wholly unskilled in the ways of politics were given governmentally sponsored training courses in the uses of political processes. But it was not only the poor and underskilled that learned to voice their dissatisfactions. Middle-class groups too -- persons with well-developed verbal, social, and political skills -- got caught up in the fashion that swept the nation and the world. Styles of behavior that had once been exclusive to trade unions and dissident minorities were picked up in PTAs and conservation societies across the country. Somehow during the 'sixties,

citizen protest and then "citizen participation" became proper, if not fashionable.

It appears that the roots of such citizen protest and participation lie deep within the historical origins of democratic social institutions. Populations in open societies are accustomed to behaving in these ways when the normal operations of the social system seem not to be working properly and when they have no way of turning to alternative systems. It takes a lot of frustration to generate a Boston Tea Party, a Watts Riot, or a freeway revolt. But when there seems to be no quiet way of shopping around and choosing an alternative to the disliked conditions, the available means is loud objection. Clear enough. But after the shouting has died down, after the protesting citizens have become participating citizens, how then can they improve upon the processes of design and governance? What then are their roles in such intricately technical affairs as transportation planning?

II. Toward an Amalgamated Style

I suspect that the major cause of protest in transportation matters is the imminence of a threat of some kind, typically the fear that a freeway or an airport is about to be built in the protester's neighborhood. Such protestations are obviously narrowly self-serving and do little to improve over-all transport system design. Virtually all citizens want improved transport facilities; it's just that none of them wants them near his house. If the newly institutionalized participatory procedures are merely to permit clearer expression of objections to these sorts of neighborhood effects, little will be gained. The aim of increased participation should be to promote positive contribution to transport-system design. The negative protest

phase should now be followed by positively creative participation. At this stage we need a major political institutional invention that will engage a wide spectrum of publics in a concerted consideration of national and regional development policies.

It would seem comparatively easy to eliminate those objections reflecting fear of reduced property values, fear of noise nuisance, or similar direct costs stemming from adjacency to a new transport facility. If these external social costs were compensated at their full "market" value, the objections should be effectively eliminated. The experience with the exercise of eminent domain suggests that proper reimbursement is usually sufficient to resolve such conflicts. Although we have been ready to pay the full costs of real estate, we have not had the habit of paying for expropriation of other kinds of property. It's time we now also pay people for the losses to intangible properties they are forced to bear.

The residual popular unease would then be those objections directed to the larger-system effects. In considerable part, one suspects, they'd reflect differences in the social values held by government technicians and engineers and the values held by lay publics.

A persisting difficulty derives from the way we organize to produce and distribute public services and from the ways we do our bookkeeping. Highway engineers, charged with installing a road between two points and with doing so efficiently, are thereby compelled to find a short route. If park land should happen to lie along the way, so much the better; it is probably cheaper to build there than along a path presently occupied by houses and other

buildings. If the "best" path should happen to require removal of a venerated building of some sort, well it's probably cheaper to remove the building than suffer the greater land-acquisition costs of a longer route. On the account sheets of the highway department, the least-cost solution defines the correct alignment.

A different bookkeeping system would produce a different route plan. Within the confines of the highway accounts, returns from parks or from architectural monuments have no value; the responsible highway official would be remiss to divert his new freeway around them at greater direct cost. Within some larger accounting system, however, the longer route with its greater construction cost, might comprise the more profitable investment. Social benefits received from park users might clearly warrant the higher expenditure. But we can detect that only if we keep joint accounts for these several systems. That's a great deal easier to think about than to accomplish, however.

We know that each of the urban systems, including each of the service systems governments supply, interacts with each of the others. Everything is connected to everything else nowadays, however uncomfortable that makes us. When we touch the land-use pattern with taxes or zoning, we thereby affect demographic mix, travel patterns, family life, school enrollments, child development processes, and so on. When we install a new transport facility, we have thereby affected a long chain of consequences for family relocation, housing construction, retail sales, labor-force composition, municipal tax revenues, recreational opportunity, job opportunity, cost of doing business, and so on in a virtually endless sequence of repercussions. Whatever one government

agency does, the outcomes inevitably fall upon the systems that other agencies are responsible for. That's so.

But what does it mean for the boundaries of each agency's responsibilities? Is the highway department thereby responsible for managing all those other systems too? Obviously not. It would cease to be a highway department and become the whole of government -- at the least. Structural amalgamation of specialized agencies into more-comprehensive ones isn't likely to work, for a range of reasons which we needn't worry about here. (For one piece of evidence, though, consider HEW, the network of principalities that has yet to find its Bismarck.) As specialization becomes more compelling and division-of-labor more fine-grained, governmental agencies must necessarily focus specifically on specialized tasks.

I'm dubious too about the prospect that a superordinate planning and managing body might "coordinate" the activities of the several specialized agencies, thus assuring that the repercussions of a given agency's activities support those of others. We have very little evidence suggesting that this sort of coordination is possible in public affairs -- even in autocratic governments such as the Soviet Union's. We are thus likely to continue to have multiplicities of agencies, each pursuing its own specialized task, each inevitably generating important consequences upon subsystems that are the provinces of other agencies, and with no prospect of either a grand accounting, comprehensive and coordinated management, or a technically effective overarching design.

In a society as pluralistic as this one, it is virtually impossible to find any design, any plan, that would suit all groups and

individuals. Because Mr. A hates what Mr. B loves, and because there is no way to say who's right, there can be only persisting difference and latent conflict.

That may be the most important observation we can make in this setting, and yet most systems analysts and systems engineers seem not to know about it. Probably because they were trained to think in the contexts of bounded and tamed problems in such fields as mathematics, physics, and operations research, where there are findable solutions, systems engineers have come to believe that there are findable solutions to social problems, too. More, they believe that there is one best answer which, once found, is indisputable. But with problems that touch upon society, and thus upon pluralities of publics holding to pluralities of value systems, there can be only a plurality of answers, sometimes one for each participant in the affair. There is no one best answer to socially related problems. There are no set solutions. There is no way to find what's right. Indeed, there is no one right to be found.³

In the absence of generally accepted criteria for design or for decision, we have accepted the criterion of efficiency. The principle of least-means, which has been so powerful a concept in civil engineering, has been carried over into transportation planning, but its utility there is now coming into doubt. With rising popular concern over questions of equity and over the distribution of benefits and costs, efficiency measures are being given far less comparative weight than they used to be. That's because people are asking, nowadays,

³Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," Policy Sciences (Amsterdam) June, 1973.

what possible social consequences might follow from the installation of a major public work, and who will feel those consequences. Questions of that sort were seldom asked even a decade ago, for the variables that entered the technicians' calculus usually excluded such incommensurables. The events of the 'sixties have now compelled us to ask questions about intergroup redistribution; and if we should forget to do so, we can now be sure that some citizen group will be there to remind us.

But though we may ask the questions, we cannot supply ready answers. We can, however, attempt to trace out the likely future effects of a proposed action, following the repercussions through as many of the connected subsystems and as many publics as our intelligence and our theory permits. We can make our forecasts of probable effects known. We can help the various partisan interest groups better understand what a proposed action would mean for them. We can, that is to say, exploit our considerable technical capabilities to fuel an informed public policy debate.

Since there are no technically valid answers to systems designs that affect social systems -- no science that can define human welfare -- there can be only politically derived answers. The task of the systems designer is therefore to contribute better information, better forecasts, better analyses to public review, such that more enlightened and better informed bargaining can be engaged among the several competing publics. The technicians themselves are interested participants in those arguments and political negotiations, of course. They may be seeking to promote their own technocratic or idealistic conclusions about the right course of action. But if the contest be properly

conducted, they should enjoy no greater power advantage than do other interested groups.

That sort of equitable distribution of influence would be very difficult to achieve, of course. Highway engineers in state government have traditionally occupied positions of very considerable power, and they are not likely to yield them voluntarily. They may be compelled to backtrack some, however, by the growing political competencies of lay publics and by the growing realization in official circles that laymen may in the final analysis know best. Since there are no technical routes to values, no science that can tell us what's the right thing to do, the involvement of the consumers is probably the only way.

Markets provide an alternative medium to debating forums. Without having to organize the publics into politics, suppliers of automobiles, for example, have been able to find out what kinds of cars to produce in what volumes. In the automobile market citizens participate directly and very effectively. Not quite so in the apparatus that supplies roads for their cars, however. It is true enough that transportation planners have sought to respond to expressed and latent market demand. As consumers acquired more cars and then drove them more, highway engineers raced to provide more space for them. Seldom did they ask whether people should have more cars or whether they should use them as they do. Rather, in the style of a self-adjusting market system, highway agencies sought to serve their customers' manifest preferences. They did so by effectively merging the first and second styles I mentioned at the outset, operating as systems analysts and designers at the fine grain of highway location and geometric design, and as market-sensitive producers at the gross grain of total highway supply.

One effect of their work was to create the world's most extensive and highest grade road network, with sufficient capacity to serve the nation's huge inventory of cars and drivers. In turn, it has made for unprecedented freedom of movement for those who have access to the system. I suspect there have been few public works programs that have so dramatically expanded the personal freedom of Americans and fewer still that have been so universally loved.

But another chain of effects has been even more pervasive and consequential. The development of the highway-auto system in America has been among the powerful contributing factors reshaping the culture, reorganizing urban settlements, revolutionizing living patterns, restructuring the economy, influencing the course of national politics, indeed, reformulating social values. So major a force in the nation's development would seem to warrant the most intensive policy analysis and the most careful projections. And yet, virtually nothing of the kind has ever been done. We devote a great deal of attention to the layout of regional road networks and corridor alignments, nowadays with great technical sophistication. We conduct bitter fights in each neighborhood destined for a new freeway link. But we ignore the large-system effects. It is well that we now ask how we might generate equivalent debate on the land-based transport systems.

I am suggesting that the neighborhood disputes, that have been so preoccupying and so much the focus of citizen participation, are comparatively trivial. Besides, if the government would only reimburse the neighbors for the social costs the transport improvements impose upon them, most of the difficulties would probably disappear anyway. And so too will that motivation for citizen participation.

It will continue to be far more difficult to engage meaningful civic debate on the larger transportation policies that really matter, and herein lies the challenge to this conference. How should the larger national and regional networks be laid out and scheduled? What pricing policies should be applied to transport services? What sorts of governmental organizations should regulate which activities? What modal mixes are appropriate? What new systems should be installed? How can those who are presently underserved by transport services be better served? What long-range developments would be most likely to serve all the diverse public's separate interests?

Questions of that scope can neither be dealt with by systems engineers alone, by citizen groups alone, nor left to the unseen hands of autonomous markets. And yet, they cannot be dealt with adequately unless all three of these approaches are pursued in concert. Because all these questions involve large and unresolvable valuations concerned with individuals', groups', and societal welfare, no technical answers can be found. Systems analysts will surely continue to play essential roles in these deliberations as forecasters of probable outcomes from alternatively hypothesized action courses, and as inventors of hypothetical policy choices; but there is nothing in their technical armament that equips them to make better choices -- better judgments -- than laymen.

The questions I list are essentially political in character. They can be equitably resolved only through bargaining -- only through debate and negotiation. But of course, debates based in ignorance, and negotiation without estimations of likely outcomes, are not likely to serve any of the participants' own interests. It is here that

analysis and systemic forecasting find their critical roles -- as informers and sources of intelligence. Technics and politics are thus mutually interdependent in a true symbiotic relationship, making the systems analyst and the participating citizen joint partners in the pursuit of social betterment.

And then the market processes can supply just the medium they'll both need for effecting the outcomes they choose, by making it possible to supply a diversity of transport-systems and to distribute a diversity of transport services. If we were smart enough, or wise enough, or technically skilled enough to invent transportation arrangements that would provide each of the many publics with something approximating the transport system each prefers, many of our transportation problems would dissolve. I suspect that means a private vehicle for everyone. Paradoxically, though, our major transport problem in recent years stems from our reliance upon the auto-highway system. Its dominance has made for so drastic a transformation of the metropolitan settlement pattern and so rapid a deterioration of other transport modes that carless persons have been positively hurt because persons with cars have been positively helped. Clearly we now need a set of institutional and hardware inventions that will more nearly equalize the tremendous advantages the automobile has brought to those fortunate enough to own one.

The major transport problem of our time, I believe, is not congestion, or pollution, or energy shortages. It is that those without discretionary use of motor cars are positively disadvantaged. The major policy direction we should be worrying about is toward ways of increasing mobility for those who are comparatively nonmobile. It is here where a market strategy could serve us well.

We shall be experimenting with an array of new hardware systems in the near future: PRTs, dual modes, people movers, improved omnibuses, minibuses, electric propulsion, linear induction, ground-effects, magnetic levitation, demand-actuated transit, and more. After the R&D work has been advanced and after the simulations have been run, the test of workability and acceptability must be actual market tests in populated settings. Similarly, some important institutional experiments are impending: road pricing, joint-transit fares, new organizations for public-transit supply, free entry into taxi and jitney service, and so on. In all these, only the consumers can give us the final answers. Only by field tests under work-a-day conditions can we be confident that any of these proposals is acceptable, and thus right.

In this sense, the market strategy becomes an effective medium for concrete citizen participation, for here the citizen participates where it matters and in ways that do not rely upon forensic, social, political, or cognitive skills. In such market-like settings the work of the systems engineers merge with those of the individual citizen to provide the only concrete answers we can expect to find in these fields. But the answers will be provided, it should be clear, only if a differentiated array of services is offered at a range of prices, such that citizen consumers have a spectrum of choice. Anything less would bring us back to where we've been, with the technical expert producing his own preferred "solution," leaving citizens the option, not of participation, but of protest.