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The Social Context
for Transport Policy

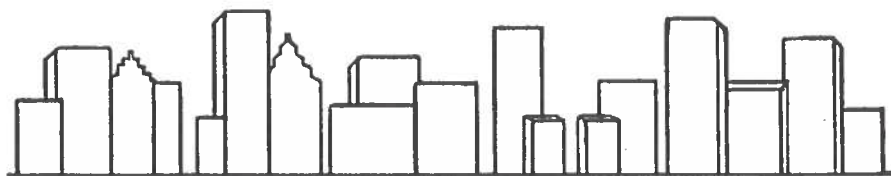
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prepared for the panel on Science and
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atives

Science & Technology and The Cities

COMMITTEE ON SCIENCE
AND ASTRONAUTICS
U.S. HOUSE OF REPRESENTATIVES



A COMPILATION OF PAPERS PREPARED FOR THE TENTH
MEETING OF THE PANEL ON SCIENCE AND TECHNOLOGY
1969

[COMMITTEE PRINT]

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THE SOCIAL CONTEXT FOR TRANSPORT POLICY

MELVIN M. WEBBER AND SHLOMO ANGEL¹

Transportation facilities, like cities, have almost no value that is intrinsic to the facilities themselves. Insofar as they *are* positively valued, their values are instrumental to the accomplishment of purposes other than transport. Except for such activities as joy-riding, in which the ride itself gives pleasure, we ship goods and we move people solely for the purpose of getting them from one place to another. And we move them from place to place only because the processes of manufacture, commerce, and social-life call for it.

We build cities for quite similar reasons. Except for the aesthetic satisfactions that some persons enjoy when viewing these remarkable works of Man, cities are valued only instrumentally—only because the business of a developed society is expedited when partners to transactions are near each other. And this is so, of course, only because the net costs of transportation and communications are lower when distances are shorter. Indeed, cities exist solely because people can greatly cut the costs of transacting their economic, social, and political business if they congregate in small areas. That is to say, cities exist because they are an effective way of reducing the requirements for transportation and of reducing the costs of the residually necessary transportation and communication.

In this sense, then, urban agglomeration and transportation facilities are reciprocals. In the complex market-processes of city building, men are constantly substituting the one for the other—constantly trading-off the rent-costs of close-in locations against the transport-costs attached to outlying locations. In concert, the millions of atomistic decisions of public and private participants in the city-building enterprise combine in a joint search for that mix of population densities, activity locations, and transport facilities that might most efficiently expedite the transactions of the society. To be sure, there are other important considerations that figure in their calculations, including their fiscal capabilities, their preferences for certain environmental qualities, their wants for competing goods and service. But the aim of reducing interaction costs is primary in our common effort to build cities and their transportation subsystems.

In its essence, a city is really a communications system. This is particularly clear within so highly advanced a society as ours. The distinctive mark of a highly developed society is fine-grained division of labor that makes all members of the society dependent upon each other. In turn, that interdependency demands constant flows of information and goods among the participants in the social system. The city, as the physical manifestation of modern society, is in effect

¹ Melvin M. Webber, professor of city planning and chairman, Center for Planning and Development Research, University of California, Berkeley, and Shlomo Angel, doctoral student, University of California, Berkeley.

a network of communication channels through which information and goods flow—through which interdependencies get satisfied and opportunities get exploited.

Interaction among individuals and organized groups is the glue that holds the society together. The city and its various transportation-and-communication subsystems are the media for interaction. Hence they are the necessary contributors to societal cohesion. It is in that sense that highways, railroads, and telephone lines are instrumentally valuable. To the degree that they reduce barriers to interaction and thus increase access to opportunities, they may also support economic development and the development of the individual persons and groups they serve.

This is why the less-developed nations are now spending up to a third of their gross national products on transportation and communication and why the United States is spending a fifth. This is why the San Francisco region is spending more than a billion dollars on a rail-rapid-transit system and a comparable amount on a parallel freeway system. It is, of course, the same motivation to facilitate intercourse that put Telstar into orbit and that will soon put a supersonic airplane into the upper stratosphere. Occupational specialization in modern societies is so fine-grained that we're impelled to invest a large part of our capital wealth in an effort to expedite interaction among individuals and groups.

As we move into the Post-Industrial stage of development, information and knowledge resources are displacing capital and natural resources as the motive forces of development. During the Industrial Era, transportation systems were the dominant instruments for linking interdependent establishments. During the Post-Industrial Era, the communications systems are likely to be the dominant ones. But we cannot really dichotomize transportation and communication, for they are essentially components of the same system. In increasing degree they are substitutes for each other (messages can be sent by mail or by wire; some interpersonal communication can be handled by telephone, others require a person trip). Part of our current task is to find that mix of location, communication, and transportation that will best facilitate transaction and that will most effectively expand opportunity.

THE END OF A TRANSPORTATION ERA

We have recently erected an elaborate scientific planning apparatus within government and industry, aimed at designing city systems and their transportation-communication subsystems. That machinery has been accumulating an impressive amount of empirical data during the past dozen years. Although we still don't know very much about goods movements or message transmissions inside metropolitan areas, we have learned a great deal about land-use arrangements and travel habits. We are now rapidly coming to understand the workings of the reciprocal processes by which land-use affects travel and by which transportation facilities affect land-use. The rapidly growing science of urbanism and technology of planning are now being reflected in operational models that have strengthened our capacities to organize our observations and to predict likely events. Transportation engineers are now confident that they can rationally design transportation

facilities to match expected travel demands. We are rapidly gaining the competency to plan for the larger land-use-and-transportation system, such that simultaneously mutual causations can be predicted, requirements for travel can be reduced, and interaction efficiency can be increased.

Because of the special orientation that has marked so much of this transportation planning work, however, nearly all of the systems-analysis and nearly all of the systems-design done so far has been dominated by a narrow, transportation-based conception of efficiency. At its present best, metropolitan transportation planning is still searching for a transportation optimum. The test of goodness is still a transportation test, i.e., the criteria are relevant to the workings of the transportation system itself, virtually ignoring the effects of changes in transportation on the workings of the larger city system and of the larger societal systems of which the city is but a part.

If our initial observations are valid—if transport has value only as it facilitates the transactional business of the social economy and as it satisfies other social purposes—then it must follow that the tests for transport goodness must be the goodness of the external, social effects. The present cost-benefit tests of alternative transportation designs are typically based solely on estimates of direct user-benefits and of capital costs, both of which are internal to the transportation system. But the dominant consequences of a transportation system are the external ones. Hence, the best design for a road, for example, is not necessarily the one yielding the lowest user-costs or the lowest capital-costs, as transportation engineers seem to believe. Rather, it is the design that yields the highest returns on the investment—the one whose output contributes most to our larger, nontransportation purposes.

The rub comes when we try to identify the nature of outputs from a public transportation enterprise that has no profit-and-loss accounts to guide it. Because most of the important effects are expressed only indirectly—as improved efficiency for individual firms, or as expanded opportunities for individuals, or as greater productivity in the national economy—it is difficult, perhaps impossible, to trace the many specific outputs of any given transportation investment.

That is part of the reason for transportation engineers having settled for more concrete, shorter-run, transportation-specific indicators, such as satisfaction of observed traffic demand, clearance of traffic bottlenecks, reduction of travel times, and reduced tire and gasoline operating costs. Because we have had no over-all accounting system for appraising transport productivity against, we have elected to appraise freeways, airports, and transit systems against their own criteria for success. Characteristically we have measured transport-system performance by input criteria, rather than by explicit output measures, using such indicators as improved traffic flow as surrogates for the real output payoff—increased contact opportunity for business and persons. And yet, we have known all along that traffic flow *per se* has no utility.

The most direct payoff of a transportation system is improved geographic accessibility among the places it connects. In turn, geographic accessibility fosters trade and social intercourse among regions; and increased intercourse is the medium of economic develop-

ment and human development. It was surely a sensitivity to those relationships that induced Congress to launch the huge railroad-building program of the last century, the road-building program of the past forty-five years, and the airport developments of recent decades. The aim was to promote economic development by making natural resources accessible to manufacturers, by making markets accessible to producers, by making labor accessible to jobs.

That transportation-construction program has been phenomenally successful. We don't yet have cost-effectiveness accounts to prove it, but there can be no question that the nation's economic prosperity has been a corollary of our transportation systems. The early farm-to-market roads were a *necessary* condition for the spectacular rise in agricultural productivity. The railroads were *necessary* for the initial development of the West, the highways and airports for the recent economic boom in California, Arizona, Texas, and the other Western states. By now a vast and highly differentiated continent has so shrunk in effective size that the geographically dispersed regions are tightly woven into an integrated national economy, society, and polity. In a very real sense, the Union was welded together by its transportation and communication lines.

In identical fashion, each of the metropolitan areas within the nation has been able first to grow and then to integrate its component establishments. The transportation and communication systems have so shrunk geographic distances within each metropolitan area that persons and firms in different districts can now deal with each other almost as easily as if they occupied the same space.

We are saying that the 100-year-old transportation-construction program in America has been far more successful than is commonly realized. By now, virtually every spot on the continent is linked to every other one. Virtually all places within the large metropolitan areas are geographically accessible to each other. Where once a few locations enjoyed economic advantage by virtue of their superior accessibility, that advantage is nearly erased. Today a business firm seeking a new location has literally thousands of acceptable sites available. It can choose among regions within the nation, among metropolitan and nonmetropolitan places within each region, and among diverse places within each metropolis. For some firms, New York or the Great Lakes may no longer have significant production advantage over Los Angeles or Atlanta. A downtown location may have no market advantage over an outlying suburb.

Now that we have placed a nearly ubiquitous transportation network over the continent, geographic accessibilities within the nation have been evened out. In some areas and for some people, distance differentials are nearly gone. For the first time in the history of any nation at any time, the barriers of spatial distance are no longer barriers to economic development. As Dr. Charles Zwick, the recent Director of the Budget, has put it, "most future economic growth can be expected to be rooted in forces exogenous to the transportation industry."¹

With Zwick and other students of transportation, we are led to conclude that the century-old Congressional aim is all but accomplished. Our basic task of building physical transportation routes is almost

¹ Charles I. Zwick, "The Demand for Transportation Services in a Growing Economy," *Highway Research Record*, No. 2 (Washington, D.C.: Highway Research Board, 1963), p. 3.

completed. It looks as though we are in the final stages of a dramatic era of the nation's developmental history: the regional and metropolitan economies have finally been integrated into a national economy. And so, the developmental role of transportation is now in the process of shifting.

In the past its predominant developmental role was as transporter of goods in commerce and laborers in production. In the future, this function will be sustained; but transportation will increasingly serve as a medium of communication and as an agent of human development and social integration. Expanding geographic accessibility for individuals is the necessary condition for access to a wide array of social opportunities, to learning, and hence to a culturally rich life. Now that our base transport system has been established and the national economy unified, these are likely to be the major payoffs from further transport improvements.

To be sure, the initial job is not quite finished. We still have a few links to install within the Interstate Highway System. Airport construction and air-traffic control are going to require a massive short-run effort. As suburbanization proceeds, we shall have to keep up the road-building work. And we have yet to make the new high-speed, ground-transportation routes operational and to modernize the railroad operations. But all these uncompleted tasks represent marginal improvements to existing routes. They have the character of system-maintenance projects, rather than of basic systems-installations.

Of course, almost everyone complains about street-and-highway traffic congestion, the time spent commuting to work, and shortage of parking space. But these complaints, too, are calls for but small marginal improvements. The conditions that people decry can never be removed, only ameliorated. The perfect transport system, giving instantaneous, door-to-door, congestion-free service can be supplied only in fairy tales and in science fiction. Levels of congestion represent the prices people are willing to pay for free movement. Even if we had the technological capability of building a congestion-free system, it is unlikely that the benefits would exceed the costs. This is not to say that improvements cannot be had—at a price. Indeed in some parts of the country the average family is already spending an eighth of its income on auto transportation, and it may be prepared to spend somewhat more. But, it appears, they are willing to spend just enough to assure that congestion levels are almost, but not quite, intolerable. We seem to have achieved an equilibrium level at which most people are just barely satisfied.

We are suggesting that, with the near-completion of our national and metropolitan route-networks, the long-standing "transportation problem" is about to be solved. Our initial problem was to make all places accessible to all others with the aim of promoting economic development. But now we face a new transportation problem—to make all persons accessible to each other with the aim of promoting human development. The central means for dealing with the current problem is to increase access to opportunity. Insofar as transportation can be instrumental in that pursuit, it is likely that roadway construction will no longer serve us as the most effective instrument. Because highway building has been the focus of our national transportation policy, we now need a new orientation.

BEING CARELESS ABOUT THE CARLESS

We are all alert to the powerful effects that urban highways have had on post-war suburbanization. Coming at the time of rising family incomes, FHA mortgage insurance, increased freedom of manufacturers from natural resource locations, expanded use of electric power, and the rise of the service industries, the auto-highway transportation system reinforced the dispersal effects of the developments; it thus helped to spark the suburban explosion.

Modern suburban growth has been structured about this relatively new transportation system. Post-war suburbanization could not have happened without widespread auto ownership *and* widespread highway construction *and* widespread motorist skills. The system's component parts are the vehicle, the roadway, and the driver. Each component is equally essential, for the system cannot operate unless all three are present.

Three separate sources have supplied these components. We have relied upon private industry for the supply and maintenance of the vehicles, upon government for the roadways, and upon the motivations of individual consumers for the drivers. Industry has, of course, been extremely responsive to market demand for motor cars; except during World War II, those who wanted and could afford to buy cars have found no shortage. Americans' love of the automobile has turned us into a nation of drivers, typically at least one per family; here we have had a gross national surplus. As we have already noted, government has been extremely responsive to market demand for highway capacity, and those drivers who have had cars have been well supplied with road space. The combination has worked well, as the extraordinary experience of Los Angeles has demonstrated to the world. There, despite fantastic population growth and heavy reliance upon the automobile system, most of its residents are able to move about with great freedom and at high speeds.

The auto-driver-highway system has been one of the most powerful and valuable inventions of our time. Few others have been so effective as instruments for the enhancement of personal freedom. The auto system has opened up many more options to the individual than he might otherwise have enjoyed—options of places to live, jobs to work at, friendships to cherish, and recreational and social activities to enjoy. He has not been limited to opportunities that happen to surround his place of residence; and so he has been able to choose among larger arrays of medical services, to select schools that may be outside his neighborhood, to maintain intimate friendships with nonneighbors, to choose his own schedule of activities without reference to timetables constructed by others. As the nearest approximation of a science-fiction transportation system, it offers door-to-door, no-wait, no-transfer service that combines privacy with flexible routing. By expanding mobility, the auto-transport system has, in effect, freed most Americans from the constraints of village life, fostering their participation in the rich opportunities that the modern metropolis affords. By now, it is an inseparable component of modern life—more, it has become the very symbol of free access to expanding opportunity.

But not for everyone in contemporary America. Not for those without cars, and not for those who cannot drive them. The poor, the young, the elderly, and the infirm do not yet enjoy the advantages

that auto-mobility has brought to others in contemporary American society. Moreover, the rise of the automobile-transportation system has worked to the positive disadvantage of the carless. They are worse off because of it.

Our present national transportation policy, with its emphasis on roadway construction and, more recently, on line-haul urban-transit systems, has largely ignored the needs of the carless. Having been focused upon capital investments in road networks, rather than service to specific population groups, ours has been but a partial policy. We have been assuming that markets would provide the other two components of the system; but, of course, the markets have been unable to supply these four groups in the way they did supply the majority of the population. The middle-aged, middle-income, middle-class groups have been well served by our transportation policies. Those who are outside the middle-majority have not been. As the result of several by-product effects, many persons have been disserved.

The most obvious negative effect, of course, has been the induced decay of the urban transit systems that nonmajority groups must rely upon. When the majority of metropolitan residents turned to private cars, transit fares were raised to compensate for lost patronage; higher fares encouraged increased use of private cars; in turn, services had to be cut, fares raised still further, patronage declined again. Thus we got caught up in the familiar downward spiral that has forced most private transit operators out of the industry.

In parallel, the low-density character of dispersed suburban residences interacted with the dispersion pattern of industrial locations to create a dispersed pattern of trip origins and trip destinations. This spatial pattern matches the operating characteristics of the auto-highway system beautifully, but it is quite incompatible with the high-density requirements of transit systems. Indeed, except for serving those who travel to central city business districts, our transit systems scarcely work at all.

In an earlier time when houses and factories were packed together in high-density cities, the high residential densities and high employment density made good transit service to jobs both practicable and profitable. But those days are now about gone. The carless persons who live in today's central city but who seek employment in the rapidly suburbanizing industries, find that most of those jobs are simply inaccessible to them. Anyone who is poor, carless, and still lives in the old city must either accept the declining proportion of job opportunities in the city, or must buy a car, or (as happens far too often today) must accept unemployment.

For those who are caught up in the cycle of poverty, a good job is the surest means of escape. Improved geographic accessibility alone will not eliminate poverty and unemployment, but it is surely one of the more effective avenues to employment opportunity. A national policy directed toward reducing poverty and unemployment must direct resources to each of the existing barriers that block access to opportunity: inadequate occupational skills, deficient cognitive skills, underdeveloped social skills, discriminatory practices, certain depressed regional economies, and absence of child-care services for mothers, to list a few. Each barrier must be lowered. But then, even if these barriers were lowered, access to jobs would still require that the geographic barriers be lowered as well. Geographic accessibility is cer-

tainly far from a sufficient condition for opening employment opportunities. But it is a necessary condition.

With suburbanization of employment seemingly an irreversible trend, the geographic barriers can be reduced in only two ways: (a) the underemployed and unemployed in a central city can either move their residences nearer to areas where the jobs are moving, or (b) they must find improved means of commuting from their present residences to those jobs.

The first alternative has, of course, been the preferred one by the millions who moved into suburban houses during the past decades. It continues to be the alternative of choice for millions more. A recent survey made at New York University found that the white population of New York City declined by nearly three-quarters of a million during the period 1960–1966, with most of the leavers moving into the surrounding suburbs. This pattern is being repeated in every metropolitan area in the nation as new housing becomes available to middle-income families and as old suburban housing trickles down to those of lower incomes. But very little suburban housing is yet old enough to fit low-income budgets, and far fewer houses are available to would-be suburbanites whose skins are not white or whose social status is low.

For the increasing number of low-status Negroes, Puerto Ricans, and Mexican-Americans in central cities, the alternative of moving to a suburban residence is not a likely prospect in the short-run future; most suburban communities are inhospitable to them, especially if they are Negro. The Kerner Commission reported that the Negro population in all metropolitan suburbs increased by 800,000 (from 1.9 million to 2.7 million) between 1950 and 1966. During the same period and within the same areas, the white population increased by 27.7 million (from 34.8 million to 62.5 million). At the same time Negro populations in all central cities increased by 5.6 million (from 6.5 million in 1950, to 9.7 million in 1960 and to 12.1 million in 1966). In contrast, the white central city population increased by 900,000 (from 45.5 in 1950, to 47.7 in 1960, to 46.4 in 1966—a decline in the past six years.)² In the largest central cities the decline has been underway since 1950.

Should there be no major change in national policy affecting population movement, we can expect these trends to persist, leading to massive racial segregation within our metropolitan areas. At the present rate of population drift,

* * * a number of major central cities will become over 50 per cent Negro in total population by 1985. These cities include Chicago, Philadelphia, St. Louis, Detroit, Cleveland, Oakland, Baltimore, New Orleans, Richmond, and Jacksonville. Washington, D.C., Newark, and Gary are already over 50 per cent Negro.³

We can envision only three strategic alternatives for linking residents in central cities to jobs in the suburbs.

(1) Perhaps a shift in national policy will redirect the locational distribution of population groups, thereby making the expanding suburban employment opportunities more accessible to those who now live in central cities. (We shall comment upon the potential role of new towns in this respect in a moment.)

² Report of the National Advisory Commission on Civil Disorders (New York: Bantam Books, 1968), p. 250.

³ Anthony Downs, "Alternative Futures for the American Ghetto," in *Daedalus, Journal of the American Academy of Arts and Sciences*, 97, No. 4 (Fall 1968), 1333.

(2) Latent employment opportunities do exist in the central cities that are not yet being tapped, and that job pool is slowly growing. The efforts of groups such as the Urban Coalition may succeed in appreciably expanding local employment opportunities for central city residents. Either of the first two alternatives will call for new transportation arrangements, linking home and workplace for those who do not have cars. (We shall later comment upon these demands too.)

(3) The third alternative route to expanding employment opportunities for central city residents is to improve transportation access to the fringes of the metropolitan areas. To date, few have found easy access along that route. In 1960, non-whites living in central city locations constituted a minute percentage of total suburban employees: 1.3 per cent in New York, 1.4 per cent in St. Louis, 1.8 per cent in Philadelphia, 2.0 per cent in San Francisco, and 6.9 per cent in Baltimore.⁴ At the same date, these out-commuters constituted 3.1 per cent of nonwhite males in New York, 9.0 per cent in St. Louis, 8.6 per cent in Philadelphia, 15.3 per cent in San Francisco, and 16.0 per cent in Baltimore.⁵

These low percentages reflect the fact that, especially among central city residents of low income, universal car ownership is still an American dream unfulfilled.

PERCENTAGE OF U.S. HOUSEHOLDS WITHOUT AUTOS *

Population groups	Percentage	
	January 1960	January 1967
Area:		
United States	25	21
SMSA **		
Central cities	38	32
Fringe	18	13
Outside SMSA	20	18
Annual income:		
Under \$3,000	56	57
\$3,000 to \$9,999	13	14
\$10,000 plus	5	4
Age of head of household:		
Under 65 years	20	16
Over 65 years	50	44

*Source: Thomas H. Floyd, Jr., "Using Transportation To Alleviate Poverty: A Progress Report on Experiments under the Urban Mass Transportation Act" (mimeographed), p. 3. Data were derived from U.S. Department of Commerce "Special report on household ownership and purchases of automobiles and selected household durables, 1960-67," series P. 65, No. 18, August 1967.

**Standard Metropolitan Statistical Area.

In the newer Negro districts within older suburbs (such as Watts in Los Angeles and South Jamaica in Queens), rates of auto ownership are somewhat higher than elsewhere. However, data for these neighborhoods can be misleading because many of the available vehicles are not suited for use on long journeys to work. A survey conducted in Watts found that—

* * * among 530 males for whom this information was available, 246 had access to an automobile, 200 of these automobiles were judged to be in suitable condition for use as reliable freeway commuter transportation, and 153 of the automobiles were insured.⁶

⁴National Committee Against Discrimination in Housing, *The Impact of Housing Patterns on Job Opportunities* (New York: National Committee Against Discrimination in Housing, 1968), p. 27.

⁵Idem.

⁶South Central and East Los Angeles Transportation-Employment Project, *Progress Report No. 6* (Los Angeles, 1967), p. 36.

Thus, 38 percent of these men had access to usable cars. The others had to rely upon public transit services or on carpools.

Our national experience with outbound transit commuter service has been discouraging. Most suburban rail and bus lines are oriented to bringing white collar suburbanites into the central business districts in the morning and returning them home at night. In the San Francisco region, for example, trains from the Peninsula and buses from the East Bay are stored in large numbers within the central terminals each morning, awaiting the return of their passengers in the evening. They simply do not make the opposite runs that would bring central city residents to suburban employment locations. The reason is all too clear: metropolitan transit travel patterns are asymmetrical. Too, even though there might be sufficient numbers of passengers living near the center-city terminals, suburban job locations are too dispersed to permit economic transit operation; too few passengers would be bound for any one suburban destination to warrant running a separate bus line to it.

In the San Francisco Bay Area, where over \$1 billion is being invested in a new rail rapid-transit system, the system is designed to serve middle-class suburbanites bound for the business centers. It appears that the geographic pattern of suburban employment is not conducive to developing a transit system that can bring central city residents to suburban jobs.

THE NONPOOR CARLESS

The auto-usage picture among the youth, the aged, and the infirm is even more discouraging. These persons cannot drive. Even if they could afford cars and even if they were surrounded by freeways, they are effectively stranded wherever public transit services are poor.

Herbert Gans' otherwise happy portrait of life in Levittown, New Jersey, was marred by the isolation the teen-agers experienced, being inaccessible to the teen-age life of the city.⁷ In Levittown, as in suburbs throughout the nation, teen-agers and children must rely upon their parents for transportation; hence they may be more dependent on parents than their peers elsewhere in maintaining friendships outside their immediate neighborhoods. The limitation on personal mobility may not only increase their sense of isolation, but also lead to increasing resentment of suburban living generally and of their parental homes specifically. Here we can only speculate; but the exodus of suburban teen-agers into central cities may be motivated by more than the pull of the city's opportunities; it may also be pushed by a rejection of their homes.

For the carless aged and infirm, a suburban residence is not usually feasible, unless there is adequate transit service. But transit service is seldom suited to their living patterns. The typical aged or infirm person needs cheap transit. He doesn't usually travel at the same time or go to the same places as those who commute to work, so the transit must be available at non-peak hours and have non-peak routes. His declining physical and mental capabilities require better than average service: short distances to station stops, short waiting periods, assured seating, signs that are easily read, and a few jerks, jolts, and

⁷ Herbert J. Gans, *The Levittowners: Ways of Life and Politics in a New Suburban Community* (New York: Pantheon Books, 1967), pp. 206-216.

bumps as possible during the ride. Transit service of that quality is rare nowadays. Those who cannot afford chauffeurs or taxis usually remain in the central city, where tolerable levels of transit service are available, though they may have to forego some desired visits to family and friends.

SUMMARY: THE CONTEMPORARY TRANSPORTATION PROBLEM

Now that a ubiquitous network of roads interlaces the whole of the continent and the whole of each metropolitan area, we have essentially finished that herculean, century-old task. We have freed the economy from the obstacles of geographical distance, and we have freed the metropolis from the boundaries that had previously constricted its spatial expansion. Distance is no longer a constraint either upon the national economy or upon the mobility of the middle-majority of the nation's population. Both have benefited greatly from the development of the automobile-highway system which by now is highly efficient, requiring only incremental expansion to keep pace with future population and economic growth. Distance can no longer lead growth, and it can no longer constrain it.

But some groups have yet to profit directly from these transport developments. For the poor, the young, the aged, and the infirm, the rise of the automobile-driver-highway system has represented a net loss. Wherever these groups have lacked either vehicle or driver, the system has not worked for them. Further, where the popularity of the system has spelled the demise of high-quality public transit service, or has induced a spatial reorganization of the metropolitan area, their losses have been compounded.

We noted at the outset that the primary function of any transportation system is to reduce the costs of overcoming geographic space. Its secondary functions, in turn, are to reduce the costs of maintaining associations among persons in different places, thus to expand the range of opportunities for establishing such associations—including associations among employer and employees. Having accomplished those objectives for most people, the problem now is to extend the advantages of reduced costs and expanded opportunities to the rest of the nation's people.

We are thus led to conclude that the very character of the transportation problem is changing. Until now the problem had been to relieve the deficiencies of route capacity that could be satisfied by public works programs. The contemporary transportation problem is to distribute the benefits of modern transportation to those who do not yet enjoy them.

To confront the contemporary problem, we shall have to call upon a different conceptual and technical apparatus than that of civil engineering, which we have traditionally relied upon. We now need some major institutional and technological inventions, and these are likely to emerge only if transportation is conceived as an integral subsystem within the larger urban social system. To accomplish that sort of inventive systems-analysis and systems-redesign, we shall have to call upon the competencies of the social and behavioral sciences and upon the new technologies. But then, if we should engage these specialists' interest, where might they most effectively search for improvements?

SOME ALTERNATIVE REMEDIAL APPROACHES

Our forthcoming efforts in transportation improvements will take place in an environment of rapid scientific, technological, and social change. Many students of the future have been telling us that history is currently at a major inflection point: America is leading the world into the post-industrial period with services replacing manufacturing as the dominant economic activity. The signs of historic change are all about us—the new computerized management and control systems, the world-wide instantaneous communications systems, the national integration of the society. The reactions to rapid changes are also clear—riots in the cities and demonstrations at the universities are but the more audible signals of the tensions accompanying the nation's efforts to adapt to change.

But however rapid the change, some present patterns are not likely to shift quickly. However critical the need to adapt, our understandings will certainly prove inadequate to the task; we must perforce continue to test out new ways, accepting those that seem to work, rejecting those that fail. Above all, the imperatives for adaptation will call for a self-critical, experimental posture.

With respect to transportation, the conditions which are relatively stable are apparent, but the kinds of experiments needed are far less clear. Among the stable patterns, the automobile-highway system can be expected to remain the mainstay of urban transportation for at least another two decades, for it will continue to supply effective mobility for those owning cars and able to drive them. Moreover, the change-over to the auto's successor will take time. We read the evidence of suburban prosperity to say that the suburbanization of the metropolis will mark the future as it has the past. We have long-since outgrown the old-style city of pre-auto days that was organized around the central business district and relied upon fixed-route transit to bring workers to factories.

The most probable forecast for the next ten to twenty years, we believe, would project expanded auto use among the middle-majority populations who will be living outside the old cities. Most poor people, including most Negro people, will continue to concentrate in the central cities. The geographic separation of jobs and job-seekers will be even more exaggerated than now, particularly for the poor, more particularly for the poor who are black. If you accept these as probable future conditions, at least for the short-run, our problem then is to find means for reducing the constraints that might otherwise perpetuate the least-desired of these conditions.

RECOMMENDATIONS

We can disentangle the mix of problems implicit within that bundle of conditions by dealing separately with a few of them. We do so only for convenience of discussion, recognizing that they must practically be dealt with in concert.

1. Cars for the carless

Many persons who are able to drive cannot now afford to own cars, and they would profit greatly by having the use of them. Governmental policy has been directed to supplying highways and transit services. We must now ask whether it is also warranted that government selec-

tively supply cars as well. To date, the supply of automobiles seems to have been judged to fall outside the range of governmental activity. We suggest that it is now necessary to review that implicit policy, if only as a less expensive method of reducing unemployment than some others now being used.

Where transit services do not work, and especially where it may be impossible for them to work with presently available technology, we must rely upon the auto-highway system. For the carless poor, the absence of the vehicle has meant that the auto-highway system is not operational. If cars could be made available to them, they would be more likely to participate actively in the economy and to have greater access to the larger society.

Some suggestive proposals have recently been made regarding the supply of usable autos to those who now lack them. Dr. Sumner Myers, at the Institute of Public Administration in New York, has computed the costs of acquiring and operating new Volkswagen "beetles" and used American cars.⁸ Under favorable fleet-purchase or wholesale-purchase arrangements, he finds the outlays compare favorably with the commuting and ancillary benefits that would accrue to the community were the cars distributed to the carless. He suggests that such distribution be conducted through sales or leasing arrangements by organizations specifically structured to foster job stability. At this time it is not clear whether such an organization might best be a profit-making venture (in the auto industry, say), a governmentally subsidized one, or a philanthropic community-service enterprise. But the early estimates suggest that a cars-for-jobs scheme may be workable. It now awaits an organizational experiment to test it out.

2. Expanded taxi and jitney service

All carless persons would profit from greater availability of low-cost taxi and jitney services, of the sorts that are common in the less-developed nations. Taxis and jitanys have some telling advantages over buses that carry large numbers of passengers over fixed routes. Their lower per-mile operating costs permit them to carry fewer passengers per trip—and thus to serve the few persons bound for any one of an array of dispersed locations. Their flexible-routing capabilities make them more adaptable to present-day travel patterns and to present locational patterns of business establishments. In effect, they combine the operational characteristics of the automobile and the common-carrier features of transit lines.

In most American cities the supply of taxis is severely limited by rigid licensing systems that have become traditional. Yet the latent demand for taxi service is unquestionably far greater than the present supply suggests. If we could more nearly approximate a free market in taxi service, we could open entrepreneurial opportunities for some who are presently unemployed, while providing transportation services to the many who lack them. Employment opportunities could be increased not only for driver-owners but for passengers as well. The removal of constraints on entry into the taxi-jitney business could make an appreciable dent into the contemporary transportation problem.

Current limitations on granting of taxi licenses have artificially inflated their value, thus limiting entry into the business to those who

⁸ Sumner Myers, "Personal Transportation for the Poor," 1968, mimeo.

can raise the very considerable capital investment now required. (In New York City, the trade in medallions resembles the trade in gold bullion.) If we were again to permit open licensing, thus encouraging individuals to go into the taxi business, equity considerations would probably require that government compensate present licensees for the lost values. It might turn out, however, that the costs to government would be far less than the subsidies to fixed-route transit and to job-generating programs. We suggest it is worth examination and possibly a concerted experimental effort.

3. Radio-computer controlled carpools.

A subscription service to a franchised carpool system could link individuals who do have cars with those, bound for the same destination, who do not. The technology for this sort of arrangement is now standard, requiring only that users phone a central switchboard connected to a computer storage unit that matches schedules and trip patterns of drivers and driven, supplemented by two-way radios to maintain contact between cars and switchboard. Professor Balderston at Berkeley has estimated the cost-accounting of such a system and finds it feasible. If it should actually turn out to be so, the scheme would clearly open suburban job opportunities to persons without cars.

4. "New Towns" in Suburbia and Central City

The countermeasure to transporting job-seekers to job openings in distant areas is the reduction of those geographic distances. During the past 20-odd years of rapid growth, suburbanization patterns have been shaped by the adaptive responses of house-builders, highway builders, industrialists, and shopping center developers, each responding to the actions of the others. Despite the active land-use planning efforts that have been made throughout the nation, there is little evidence to suggest that it has been effective in guiding the over-all developmental forms of metropolitan settlement. Each suburban municipality has been looking inward upon itself, seeking its own specialized interests, irrespective of the implications for the larger metropolitan system. At the municipal level of policy, land-use planning has probably been quite effective; it has been supplemented by restrictive zoning laws and building codes that work to keep out persons and industries deemed incompatible by the local suburban resident. Most commonly, of course, it has been families of low-income that have been excluded, making for the metropolitan-wide segregation of socio-economic and racial groups we discussed before.

But not only outsiders have been disadvantaged by the control processes which govern suburbanization. The absence of metropolitan-wide development policies has worked to the disadvantage of suburban residents as well; they, too, find jobs, schools, hospitals, shops, and friends so dispersed as to require numerous long trips. They, too, have missed the qualities of urban services they knew in the older cities. However much better off they are in their new homes, the quality of their suburban environment does not approximate the environmental qualities we are capable of creating. Suburban growth in America accurately reflects our economic prosperity and newfound freedoms, but the poverty of its environmental qualities is no source of pride.

Many nations of the world, with far less wealth than ours, have done far better than we. The "new towns" of Britain, Sweden, Finland, Japan, and so on have set a standard that we have yet to achieve, al-

though recently we have initiated a few important demonstrations which exploit our capabilities and may well set a pattern for the nation.

At Columbia, Maryland, for example, an effort is being made to substitute intelligence for the haphazard, adaptive responses that have shaped suburban developments elsewhere. Having acquired a large land area under single ownership, the managers have the capacity for planning a large settlement in its spatial entirety. Space is being provided for housing suitable for a wide array of groups and located near a wide array of employment opportunities. Health, education, child-care, and other community services are being planned in concert with the location of community facilities and housing. Transportation facilities of several types are to be installed to permit easy movement among linked establishments. But the key to the design is the reduction of the need to travel. Most residents will have the chance to work near their homes, and many surely will.

Similar coherent development schemes could also be built inside the old central cities. Interdependent industrial establishments could be located near each other and each near the homes of its employees, if the industrial composition can be planned to match the occupational composition of the labor force. In the central city, just as in the suburbs, we *can* design far better social services and community facilities than we have yet. We have far more know-how than is being used. The missing component has been the institutional arrangements that would permit this to happen.

Among the most devilish deterrents to rationality has been the separatism that has earmarked governmental agencies charged with categorically discrete tasks. Health agencies have focused on one set of services, school boards on another, highway departments on another, transit agencies on still another. Each views the public interest in its own special image. Though he may serve his community with selfless devotion, the official in each agency sees the public interest as being dependent upon more of the service his agency happens to supply. A communications barrier around each categorical agency keeps it from working with others. Quite like the adaptive responses of the house builder, each is constantly responding to the other's action—after the fact.

Perhaps we can now design governmental institutions capable of coherent, mutually supportive actions in the urban development fields. The British new towns corporations have been highly successful. The new model cities agencies here are making some starts at it. If Congress were to authorize the equivalent of the British new towns corporations, as Lord Llewelyn-Davies has described them, local governments would respond as readily as they have to other Congressional incentives.

It would be appropriate to undertake some such coherent planning efforts now, for new settlements outside the jurisdictions of present suburban municipalities would be freed from many existing constraints. Then, if they could experiment on reducing the need to travel by making residences available to all comers at locations near to job places, they would make significant inroads on the new transportation problem.

Neither transport nor land-use policy can be sufficient to deal with the large human problems that are localized in our cities. At best these policies can reduce the geographic barriers to opportunity. In the

aggregate, these may be the weakest barriers; a national policy directed toward human development would surely put its highest priorities into education programs, job-training programs, health services, child-care services, and other more direct aids to underprivileged and privileged groups alike. Because our transportation and communication systems are so highly developed, geography has become one of the least influential of the variables affecting personal growth and economic growth. Transport is therefore not likely to be the key medium for increasing access to the riches of modern society. But, just as surely, transport remains a necessary condition of accessibility to the riches.

That fact poses the central issue for national transportation policy: If our national aim is to expand accessibility to opportunities, such that all Americans may enjoy the cultural and material wealth now at hand, transport investments must find their priority position among a large array of other access-expanding media. It is not roads we want, or trains, or buses, or mini-cars. It is the *output* of those systems—the returns they bring in human welfare. Our purpose is not to build roads. It is, rather, to enable all persons to gain access to modern society.
