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Author

Webber, Melvin M.

Publication Date

1979-12-01

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MELVIN M. WEBBER

The Transportation Problem is a Problem in
Social Equity

Institute of Urban & Regional Development
University of California, Berkeley

Reprint No. 183

Reprinted from: *New Urban Rail Transit: How Can Its Development and Growth-Shaping Potential Be Realized?* Subcommittee on the City of the Committee on Banking, Finance and Urban Affairs. House of Representatives, U.S. 96th Congress, First Session. U.S. Government Printing Office, Washington, D.C. (December 1979), pp. 191-196.

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NEW URBAN RAIL TRANSIT: HOW CAN ITS
DEVELOPMENT AND GROWTH-SHAPING
POTENTIAL BE REALIZED?

SUBCOMMITTEE ON THE CITY
OF THE
COMMITTEE ON
BANKING, FINANCE AND URBAN AFFAIRS
HOUSE OF REPRESENTATIVES
96th Congress, First Session



DECEMBER 1979

This report has not been officially adopted by the Subcommittee on the City and may not therefore necessarily reflect the views of its members.

U.S. GOVERNMENT PRINTING OFFICE

51-049 O

WASHINGTON : 1980

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THE TRANSPORTATION PROBLEM IS A PROBLEM IN SOCIAL EQUITY¹

By Melvin M. Webber

Several long-term trends seem to have had a stable and one-directional influence on urban transport. It looks as though they will be stable into the long-range future as well, and so we would be wise to accept them as given and try to cope from there.

The first of those trends has society becoming increasingly specialized. Increasing specialization has been cumulating for centuries, and it's likely to continue to. Because division-of-labor has become ever more fine-grained, self-sufficiency is no longer possible. As a result, more and more people are dependent upon more and more other people, and so establishments and groups of all sorts have by now become highly integrated. We've by now evolved a close-knit and unified national and, to some large degree, international, political-economic-social system.

Participation in modern society requires intimate connections within that system. Those who are not connected are, to that degree, deprived, if not excluded from participation and from society's rewards.

The second long-term trend has been toward increasing pluralism. This is a society of minorities—all sorts of minorities, not only religious, racial, and social-class minorities, but minorities of people with different belief systems, different habits, different values, different behavior, different preferences. That, too has meant increasing dependence on connectivity, on being tied into one's own groups. Because the groups that matter most to moderns are those defined by shared interests rather than by shared places, the connectors have to be capable of spanning geographic space.

The third long-term trend is the result of a series of technological developments, each of which has effectively reduced the friction of space. Another way of seeing them is as technological developments that compel or permit footlooseness, such that factories producing modern machines—electronic devices, for example—can be located virtually anywhere. Plants that once belonged in Schenectady are now anywhere—in such strange places as Korea, Taiwan, Singapore, and Malaysia. Establishments providing services, rather than producing physical products, are finding themselves even more footloose than the new factories. So long as the connecting channels are open to them, they suffer virtually no locational constraints.

Fourth, as locations of factories, commercial and service establishments, and residences have become more dispersed, people have become increasingly reliant on those transportation and communications systems that connect them all directly. The peculiar and most important

¹ This paper is based upon comments made to the Aspen Conference on Future Urban Transportation, Aspen, Colo., June 5, 1979.

thing about both the automobile and its analogue, the telephone, is their capacity for providing random access. Each of these devices directly connects pairs of places, wherever they may be. Telecommunications do it virtually instantaneously; automobiles involve a time lag. Both provide direct one-to-one connections between those places and those persons that are hooked into the networks.

By exploiting the random-access capabilities of automobiles and telephones, interdependent persons and interdependent organizations can stay in close contact. That capability has in turn fostered spatial dispersion within metropolitan areas and across the continent, and at just the time when functional integration among virtually all industries and all groups was being accomplished. By now, the national political-economic-social system has evolved into an incredibly complex network of interdependent and interlocked parts that are scattered across extensive space. This pluralistic nation of specialists has prospered despite extreme geographic separation because the transportation and communications technologies have permitted rapid and intimate contact across geography. Automobiles, telephones, and dispersed settlement patterns are now integral parts of contemporary American society.

The fifth long-term trend I'd note is the steady rise in average incomes and average wealth, permitting most of us to pay the increasing costs of connectivity, random-access, and dispersed settlement. Americans have always been willing to pay whatever have been the costs of mobility and accessibility, in part no doubt because these are themselves attributes of high standards-of-living and of personal freedom. The long-term secular trend that has sustained rising income and wealth will undoubtedly also sustain capacities to move about freely, even though the costs will be proportionately higher than they used to be. Today, with energy and housing costs continuing to rise rapidly, we'll not have to wait long to find out how elastic is the American's demand for connectivity and suburban living.

Recent inflation in gasoline and housing has generated speculation that automobiles might be replaced by mass transit and suburban houses by high-density central city apartments. There is no doubt that some persons at the margin will make these shifts. But the scale of sunk investment in present suburban buildings and public infrastructure and the high values placed on both automobility and low-density living make it implausible to expect that many will. More likely, families will modify budgets to allocate more money to transportation, so they can still commute from suburban homes while paying higher prices for gasoline. Moreover, the automobile-telephone-suburb system is by now such an integral aspect of contemporary American society that major reductions in any of the three components of that system would mean extreme disruptions in the social order. Even if we willed it so, we probably no longer have a choice other than continued reliance on autos, phones, and suburbs.

The sixth long-term trend is less happy than the previous five: as persons with cars, phones, and suburban houses have become better off, those without have become worse off. Indeed, it's because some people are better off that others are worse off. That's in part true because they perceive themselves to be relatively deprived. But it's in larger part because the rise of the automobile system has caused

the decline of mass transit systems. Those without cars, no longer having access to mass transit networks, are worse off than before. Similarly, the rise of the suburbs has meant dispersion of a great many metropolitan jobs to outlying areas. Persons who, because of race, income, or social status, find their residential choices constrained to central city locations also find their job opportunities constrained by lack of transport to dispersed job sites. Mass-transit services can serve suburbanites who work in metropolitan central business districts. However, their sheer geometry makes them incapable of serving more than a small fraction of center-city residents bound for suburban factories.

Thus, the rise of the auto-phone-suburb system, which has so enriched the lives of middle-majority persons, has been relatively impoverishing for persons who are poor and also members of racial minorities. It has brought on one of the most troublesome dilemmas in social equity the nation faces. In a mobile society, those people whose budgets are too small or who are physically unable to drive or whose locational freedom has been constrained are positively disadvantaged by the increased mobility and increased locational freedom that the majority enjoys.

Here lies our most intractable transportation problem. By contrast, problems of traffic congestion, air pollution, highway accidents, and energy consumption are manageable, for each can be made to yield before technologies or regulatory techniques that are now in hand or soon will be. If we were willing to pay the costs of staggered work hours, peak-hour traffic volumes could be considerably reduced, and traffic engineering techniques could appreciably smooth out traffic flows. Prospects for an electric urban car are increasingly bright, promising large improvements in air quality and maybe in fuel economy too. But problems of immobility and inaccessibility have no apparent solutions. In the long run, I expect these will persist as dominant transportation issues, because they involve perhaps half the nation's people—those who are old, young, poor, and handicapped.

Early transportation developments were pretty well managed by civil engineers who built civil works, but their job is nearly done. They succeeded in connecting all places to all other places. The remaining task is to connect all people to all other people. We have yet to find a way of giving all people access into the connector network that works so well for persons who have both cars, planes, and dollars. So far we have lacked both a professional group with a kitbag of tested tools and the national will to resolve the dilemma.

The ultimate solution to the transportation dilemma is to create the equivalent of automobility for everyone who lacks an automobile. I propose as a national objective, as a new national standard, that everyone have equivalent mobility and equivalent random-accessibility to that enjoyed by people who now have discretionary use of cars.

We don't yet know how that might be done. Lots of suggestions have been made, a few of them tried, but nowhere have we come anywhere near that standard. One highly promising way is greater use of automobiles as public transit vehicles—as taxis, jitneys, car pools, and various other paratransit modes. As compared with large-transit vehicles, automobiles can achieve equal or greater fuel effici-

ency. The differences hang on the relative proportions of seats occupied by passengers. A bus or train that carries mostly empty seats along its routes is not operating at its designed efficiency, nor is a car that carries only its driver. But, if a twenty-five mile per gallon car can be made to carry just one additional person as passenger, it would operate at fuel efficiency equal to that of the average bus and far superior to BART's.

The advantages of cars over public transit vehicles are so great that, despite their far higher dollar costs, most persons who can afford cars have elected to abandon public transit in their favor. Automobiles' overriding advantages are door-to-door, no-wait, no-transfer, and flexible-route service. No other transportation system comes close to that quality standard. All mass transport systems require passengers to walk or drive from their homes to the transit stop, then to wait for some time, and, for most passengers, to walk again at the destination end of the trip. Some trips require use of more than one transit vehicle with the accompanying frictions attached to transfers, including additional waiting. In contrast, the auto is ready to leave at any time, and it carries its passenger directly to his destination.

Time-costs of accessing the system turn out to be the major problem plaguing BART in the San Francisco area. Apart from its mechanical, electronic, and labor problems, all of which are susceptible to repair, BART's fundamental problem is built into its basic design as a mainline railroad. Its operating characteristics are at the polar extreme from the automobile's, and so it is little wonder that it has been unable to attract many motorists—less than a third of the number expected.

Buses do better than trains in their capacity to get closer to people's houses and destinations, thus more closely approximating door-to-door service. But the bus cannot equal the car's service standards. When it becomes a mini-bus in subscription services, as in a van-pool, it then comes close. In a still smaller version, when it becomes a taxi that calls at one's door, it then nearly approximates the operating standards of a private car and hence becomes a potential substitute. If dollar-costs and waiting time could both be reduced, taxis would be a viable substitute.

In light of the overwhelming attractiveness of automobiles all over the world and in light of their overwhelming advantages to individual travelers, the mandate to urban transportation policy—the general principle—should be clear: If we are to develop a satisfactory public transit alternative to the private car, it will have to compete with the private car on its own grounds, approximating the private car's operating service standards.

In the long-term future perhaps we can figure out a way of building a personal rapid transit system that's both workable and affordable. PRT in a high-density-network of routes might meet the requirements for both random access and the standard of automobility for carless folk, while offering a competitive alternative to intraurban auto use. In the long run we probably need a new surface vehicle—a slow-moving vehicle that young, old, and handicapped people can drive. But as the new motorized-wheelchair traffic is now showing, it will also need a road network safely separate from

those carrying high-speed and heavy cars and trucks. Short of something dramatic, the solution to carlessness among the transit-dependent poor will no doubt continue to be cars. Some have suggested it might be cost-effective simply to give away low-priced and used cars to people who are unemployed and also poor, as a way of opening job opportunities in places public transit doesn't serve well. Others have suggested direct cash payments to poor persons, in the form of transportation vouchers, permitting them to purchase accessibility in whatever form they prefer.

Short of a technologic leap, innovative uses of the bus may be our best short-run solution. The city of Curitiba in southern Brazil is using buses in express modes on exclusive bus-only lanes, and with phenomenal success. The Curitiba model has now attracted the support of the World Bank and is being copied all over Brazil. Low costs and high returns are making it a model that North Americans may soon find attractive as well. Buses are being operated in convoys through the center of São Paulo, rather like cars in a train. On city streets in the center of that giant megalopolis convoys are approaching capacities equal to those designed for BART, albeit at small fractions of the cost.

Manila's jeepneys offer another dramatic model. That jitney system has proved to be remarkably effective, yet inexpensive; and it creates job opportunities for lots of people while providing low-cost transportation for millions of riders. Although jitneys have not been favored in this country for a long time, perhaps it is now time to try again, taking our cues from those with fewer means who have done so well with them.

At the same time, and whatever we do to help those who are relatively immobile, we can expect that most people who can drive and who can afford cars will continue to do so. It has become chic in intellectual circles to deride the automobile, for whatever reason. Perhaps for some it's because the automobile has indeed become the mass-transportation system in this country; as the medium of the masses, it has become declass  . Critics deride its large appetite for petroleum, its noise- and air-pollution effects, the huge accident toll, the chronic congestion that accompanies widespread use, and the suburbanization that has followed in its wake. Now when energy costs have suddenly shot up, many critics expect a mass movement to public transit systems. By most counts, those expectations are not warranted.

If Congress were to support an all-out effort to produce liquid and gaseous fuels from coal, the short supplies we have recently been experiencing could be turned to surpluses, such that America may later again become an exporter of fuels. The prices of gasoline and its equivalents will undoubtedly be very much higher than in the past. But the long-term trends we identified are not about to be diverted by fuel costs. Rapidly rising auto-use in Europe and Japan, where gasoline has always been much more expensive than here, suggests that Americans who are far more dependent on cars than anyone, are unlikely to give up their cars until fuel gets to be exorbitant. As Herman Kahn aptly put it, "Energy used to be cheap in America, and it has recently become inexpensive." Europeans and the Japanese certainly think so.

Increasing specialization and interdependency, increasing pluralism, and increasing footlooseness will mean increasing reliance upon automobiles, telephones, and the new electronic communications media. Those who don't have random-access capabilities will be increasingly disadvantaged, increasingly worse off over the course of time. I fear that if we don't succeed in making the equivalent of automobility available for everyone, especially in a footloose suburban world like this one, we run the danger of perpetuating an underclass of relatively immobile, disconnected, and dissatisfied citizens. In this sense, the transportation problem is no longer a problem in civil engineering, but it has become instead one of the most difficult problems in social equity. If we're to find a way out, it looks as though it will be making automobiles and their equivalents available to everyone.