

FUTURE URBAN PASSENGER TRANSPORTATION SYSTEMS ALTERNATIVES: LIFE STYLES AND VALUES

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ABSTRACT

This paper looks ahead to the long-term future of urban passenger transportation, exploring trends that appear to be shaping the future, and then postulating some strategies and ideas that may change the direction of those trends to providing a more balanced urban transportation system for the future. In particular, the paper examines the impacts of trends in life styles and values on the future of private and public transportation in the urban area, and then examines the extent to which privatization and deregulation, particularly in the U.S. context, may be productive in reshaping the future. It is concluded that there are no overwhelming arguments for changing ownership, although regulatory reform may be required. There appears to be substantial potential for changes in the structure of transit systems, and in operational aspects that would change the potential future.

INTRODUCTION

This paper looks ahead to the long-term future of urban passenger transportation and suggests some of the directions that might be pursued in its provision. No attempt is made here to try to foresee how much capital investment will take place in transportation alternatives, nor how it will evolve over time; nor to anticipate what technological changes may take place in vehicles and vehicle systems, except in very broad-brush terms. Because of the author's background, the paper concentrates on those trends and directions that are most apparent in the United States of America, although some of these trends may also be suggestive of where other countries are heading into the 21st century. At the time of writing, detailed information was not yet available from the April 1990 decennial census in the U.S.A. Only broad statistics were available from the census, so that information on the directions of certain trends in lifestyles and values is still somewhat speculative.

An initial comment is in order about the dangers of forecasting, which, in almost any field remains primarily an art form, rather than a science. The accuracy of forecasts is notoriously poor in virtually any field - whether it be that of forecasting the weather tomorrow or the state of the economy next year. Having spent many years trying to make long-range forecasts of travel behavior in urban areas and developing better methods with which to do this, the author is particularly conscious of how difficult it is to make transportation forecasts. The forecasts in this paper may be characterized best as representing educated guesses. Nevertheless, the activity of trying to make such forecasts and examining the direction in which one would like to see the future develop can be most illuminating in evaluating actions taken in the near term. Therefore, while the content of this paper is highly speculative and probably no more accurate than recent forecasts of patronage for new rail systems in the U.S., it is hoped that the exercise may prove both illuminating and instructive.

SOME DIRECTIONS IN LIFESTYLE AND VALUE CHANGES

Over the past decade, many important trends and changes have occurred in the evolution of lifestyles and values in the U.S. These changes are not necessarily specific to the U.S., but may be evident in many other countries. Those most relevant to transportation are probably household size, auto ownership, locations of residences, numbers of workers in the household, journey-to-work distances, and trip chaining behaviors.

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Based on available census data, household size in the U.S. has declined over the past decade and appears likely to continue to decline for the next few years. Most metropolitan areas showed a decline from an average household size of about 2.5 to 2.7 in 1980 to around 2.2 to 2.4 in 1990. Looking at a longer-term trend, the National Transportation Strategic Planning Study¹ reports that average household size declined nationally from 3.37 in 1950 to an estimated 2.67 in 1986, while the total number of households almost doubled from 43.6 million in 1950 to 88.5 million in 1986. Average household size is usually lower in urban areas than in rural areas. While household size has declined, the number of two-worker households has increased substantially. These changes have significant impacts on travel as is discussed later in this paper.

Car ownership in the U.S. has continued to grow, despite theories suggesting that it was close to saturation levels as long ago as 1980. The National Passenger Transportation Survey (NPTS) of the U.S. indicated that the proportion of non-car-owning households has dropped from about 9 or 10 percent of the population in 1980 to less than 5 percent in 1990. Similar findings are emerging from metropolitan travel surveys conducted within the past two years. At a recent conference², several Metropolitan Planning Organizations reported revising their trip-generation cross-class models to split the 2+ car-owning households into 2 and 3+, and finding that the 3+ car-owning households already outnumbered zero car-owning households. In the Boston metropolitan region, zero car-owning households have declined in the inner city from 37 to 27 percent since 1980, while 2+ car-owning households have increased from 19 to 31 percent. In the outer areas of the region, zero car-owning households have declined from 11 to 3 percent of the population, while 2+ car-owning households have grown from 50 to 73 percent. In a society in which transit ridership is made up predominantly of those with no other choice (i.e., captive riders), this has major implications for the future of public transit in the U.S.

The urbanization of the U.S., observed over the past several decades, continues unabated, with the result that, for the first time in its history, more of the U.S. population lives in large urban areas than in small urban and rural areas. Within urbanized areas, however, suburbanization continues, with growth of low-density residential land use at the periphery of the urban area, and loss of population from the inner city. This trend is continuing, despite indications of re-population of central areas in some cities; the growth of suburban residences is outpacing growth in the urban core. Recently-released data for the Baton Rouge Metropolitan Area, for example, shows population declines in the inner city of about 40 to 50 percent from 1980 to 1990, while suburban areas have quadrupled or more over the same period.

The length of the journey to work also exhibits growth. This is partly a function of suburbanization and partly a result of increasing peak traffic congestion. In Los Angeles, a recent survey by Commuter Transportation Services, Inc.³ showed an increase in the average commute time from about 40 to about 65 minutes from the mid 1980s to 1990.

Another relevant change is the appearance of extensive trip-chaining behaviors. Trip chaining is probably a response to two phenomena. In particular, the emergence of an increasing proportion of two-worker households has created the need for one or both workers to perform various nonwork functions on the way to or from work. These functions include dropping off and picking up children at school or daycare centers, convenience shopping, banking, and other types of personal business. The second phenomenon is the level of congestion in the transportation system, which tends to commend to the urban resident the notion of running multiple errands once a person is performing any one out-of-home activity. While it may have originated in the oil crises of the 1970s, it appears to have become an established behavior in the 1990s, more as a result of increasing off-peak congestion and the increase in the number of activities in which many people are engaged. Overall, as a society, the American of the 1990s appears to be involved in many more out-of-home activities than before, particularly when school-age children are in the home.

In a survey in Boston, Massachusetts, the effects of trip chaining are evident in the make-up of trip rates for households. While workers per household have increased significantly, similar to what has been experienced elsewhere in the U.S., the average trip rate for home-based work trips (i.e., those trips between home and work) are similar to those measured 25 years ago in the Boston region and are comparable to those in general use throughout the country. Trip rates for this purpose are reported in the range of 1.3 to 1.4 trips per day per household.⁴ On the other hand, home-based nonwork trips exhibit about a 25 percent increase to a regional average of 5 trips per household per day, while non-home-based trips are reported at about double the level of 25 years ago, averaging about 4 trips per day. Many trips that would have been trips from home to work have now become a trip from home to a nonwork activity, followed by a trip from the nonwork, non-home activity to work, and the reverse at the end of the day. Quite frequently, several nonhome activities may be chained together between work and home. This generates the replacement of some home-based work trips by a combination of a home-based nonwork trip and one or more non-home-based trips and explains the static home-based work trip rate and the increases in both home-based nonwork and non-home-based trips. In addition, several nonwork

activities are chained together, involving two home-based nonwork trips and one or more non-home-based trips between the two. (It should be noted that some of the increase in non-home-based trips results from an improved instrument that probably captures non-home-based trips better than previous instruments.)

POLICY DIRECTIONS IN URBAN PASSENGER TRANSPORTATION SUPPLY

The 1980s and prospects for the 1990s indicate some significant changes in the future supply of urban transportation in the U.S. To what extent these same changes will occur in other countries around the world is not clear, but it is not unusual to find similar influences and directions arising in other countries.

First, the real dollars available for capital improvements in transportation have declined significantly over the past twenty years in the U.S. This decline has produced an increasing interest in both Transportation Supply Management - TSM - (getting more use out of the existing supply) and, more recently, Transportation Demand Management - TDM - (changing the diurnal distribution of demand and reducing the level of demand for vehicular trips). The expansion in infrastructure, particularly of highways, of the 1950s, 1960s, and 1970s will not continue in the future. While urban rail projects will likely continue to be built, the pace of construction is likely to be significantly slower in the next twenty years than in the past. One of the anticipated changes in the next twenty years is more careful targeting of available capital expenditures towards specific mobility needs and issues. In the U.S., this is evidenced by federal mandates to the states to put in place management systems for pavements, bridges, safety, and congestion. The primary goal of such systems is the identification of prioritized needs for correction of problems or investment in additional infrastructure.

A significant influence in the change in investment pattern has been driven by environmental concerns, particularly relating to the increasing diversion of land for constructing transportation infrastructure and the consumption of scarce resources both in facility construction and in transportation systems motive power. More recently, environmental concerns have shifted focus to energy, noise, and air quality, and transportation policy and capital investment is now being impacted most significantly by laws and regulations mandating achievement of clean air and reduced energy consumption.⁵ Efforts are underway to place a higher priority on the provision of mass transit as an alternative to the car, particularly for commute trips, and to increase the occupancy of private vehicles, through pricing mechanisms, particularly focusing on road-user charges, tolls, and some reassessment of the parking costs that currently represent a substantial hidden subsidy to private car users.

Consistent with both reduced capital and the environmental concerns, policy has changed direction to concentrate on getting better use out of existing infrastructure. Two primary directions are apparent. First, TSM aims at increasing the effective capacity through better control of traffic flows, resulting in a supply-side improvement in facilities. Policies such as area traffic control, reversible lanes, reserved bus lanes and high-occupancy vehicle lanes, are part of TSM. Second, TDM seeks to change the patterns of demand and the amount of demand on the system at a given time, through such procedures as work-hour changes, encouragement of compressed work weeks and telecommuting, subsidization of commuters to persuade them to change their commute habits, and other similar strategies.

Associated with TSM and TDM policies, but a separate part of the policy scenario, is the current interest in intelligent Vehicle and Highway Systems (IVHS). IVHS is aimed at several elements of improved transportation supply within existing facilities. It may include real-time information to drivers about incidents on their current route and provision of data on alternative routes; improved information on vehicle and roadway conditions through holographic and similar displays; and automated control of vehicles on certain types of facilities, leading to increased capacity capabilities through the faster response times and more efficient vehicle positioning possible from a computer controlled vehicle system.

The impact of land-use decisions on transportation systems, as well as the impact of transportation on land use have long been recognized. However, in the U.S. particularly, relatively little has been done to control or capture the synergistic effects of land use and transportation. Relatively little is known of precisely how land use and transportation interact, and when either one is cause or effect. However, there is increasing recognition that land use and transportation interact and that many transportation problems, including those relating to energy consumption and emissions, may be solved partly by policies that change land-use patterns and take account of the catalytic effect of transportation systems on urban sprawl. In this context, the notion of a jobs/housing balance at a subregional level⁶ has recently emerged. Unfortunately, this concept is not currently based in behavior, which tends to show that other factors may be far more important influences on home location than distance between home and work⁷ in the urbanized area. Nevertheless, other efforts are also striving to account for changes in residential and job-location patterns that may result from different transportation investment patterns, through the iterative application of land-use models with travel forecasting models.⁸ Furthermore, policy directions are increasingly considering the impacts of land use and transportation together in an effort to

solve some portion of the transportation problem.

It is evident in the U.S. that an "urban rail mentality" continues to impact policy significantly. While the federal government has sought to decrease interest in rail, and has suggested that many of the benefits thought to arise from rail are not real⁹, at the local level, rail continues to be seen as a desirable strategy to solve transportation problems. Notably, however, the emphasis currently appears to be swinging away from more conventional urban rail solutions and favoring a consideration of commuter rail. (Urban rail involves short lines - up to 18 or 20 miles - with station spacings of about 1 mile, relying on diversion from linehaul bus but with bus feeder service to stations; while commuter rail lines are longer - up to 50 miles - with station spacings of 2 to 5 miles and reliance on diversion of linehaul car driver trips but with feeder service to stations by car.) The primary focus of these strategies are to use existing rights-of-way, or to consider new technologies such as magnetic levitation.

Overall, policy directions that are apparent at the beginning of the last decade of the twentieth century seem to indicate the following primary foci:

- Decreasing availability of capital for transportation solutions;
- Despite decreasing capital availability, a strong emphasis on providing a richer set of alternatives for travel in the urban area, particularly for the commute;
- A continued emphasis on maximizing the use of existing transportation supply investment through both supply and demand management; and
- A greater willingness to confront issues such as the interaction between land use and transportation systems.

MARKET-SHARE TRENDS IN THE U.S. URBAN TRANSPORTATION ENVIRONMENT

Declining transit ridership, evident in the U.S. since the end of World War II, changed in the 1980s to increasing absolute ridership. However, most of the increases evident in U.S. cities still represent a declining *market share* for transit, because total travel is increasing more rapidly than transit ridership. Table 1 shows a comparison of transit ridership estimates for the U.S. for most of the 1980s, indicating that overall growth in the period was about 9.5 percent.¹⁰ While precise statistics are not available for total urban area travel over the same time period, evidence suggests that the transit share of the market declined by about 1 to 1.5 percent.¹¹ The mass transit share of total person travel declined from 2.9 percent in 1969 to 2.2 percent in 1983, while total person travel grew over the period by 79.3 billion trips or 55 percent.¹² Statistics from the 1990 Census and NPTS will be needed to provide more accurate information about changes over the decade in total travel, but it is unlikely that the trend in transit market share will have changed in the latter half of the decade.

Another important market-share trend in the U.S. is in the auto occupancy, with the National Transportation Strategic Planning Study¹³ indicating a significant decline for the work trip from 1980 to 1985, while the auto share of travel increased. This is resulted in an increase in the drive-alone market share of work trips from about 65 percent to about 74 percent, and a drop in the shared-ride market share from about 21 percent to about 15 percent. Even in areas that have pursued aggressive programs of ride-sharing incentives and solo-driving disincentives, the shared-ride market share has not increased significantly. The share in the Los Angeles Region for shared ride, carpool, and vanpool, has stabilized at about 10 percent of the commute market, in spite of efforts to build a significantly larger market share.¹⁴

Therefore, one can assume that the downward national trend in the market share for multi-occupant vehicles reported by USDOT has continued. Further, because family size is declining and shared rides for nonwork trips often involve other family members, it can be assumed that the shared-ride market share for nonwork trips will not have increased

Table 1:
Comparison of Transit Ridership in the U.S. over the 1980's

Year	Annual Ridership (1,000s of trips)	Change from Prior Year
1982	8,175,248	-
1983	8,638,982	5.67%
1984	8,851,235	2.46%
1985	8,659,300	-2.17%
1986	8,802,150	1.65%
1987	8,806,200	0.05%
1988	8,739,210	-0.76%
1989	8,907,966	1.93%
1990	8,956,479	0.54%
1982-90		9.56%

As noted above, current U.S. policy directions mandate considerable emphasis on TDM strategies, in response to both congestion management and cleaner air. Generally, these efforts are manifested as combinations of incentives and disincentives to encourage use of ride-sharing options through such procedures as HOV lanes on freeways; preferential parking and access to freeways; subsidies for carpools, vanpools, and transit; and changes in parking to penalize single-occupant vehicles and subsidize multi-occupant vehicles. To date, there are no clear indications of how successful such strategies will be. Preliminary evidence is very mixed, tending to show that there are impacts on average vehicle occupancy at a site¹⁵, while impacts at the metropolitan level tend not to be detectable, as shown by the CTS State of the Commute surveys¹⁶. Implementing TDM measures may not impact market shares measurably at the metropolitan level, so the decline in shared-ride, transit, and walk, as percentages of the total transportation market, will likely continue.

There is an additional trend that is likely to impact market shares in the U.S. and possibly elsewhere. Recent changes place increased emphasis on the provision of high technology accessories in cars. This began with the introduction of cellular telephones and has spread to in-car facsimile machines, micro-computers, compact-disc players, and a variety of other office and home equipment for the use of the car driver, particularly during commute and business trips. At the same time, car manufacturers are creating more comfortable environments within the car that provides a solo driver with a cocoon-type environment that may exceed the comforts of home.

Some research indicates that the time spent in a car driving between home and work offers an increasingly scarce attribute to many urban dwellers - privacy, quietness, and control of one's own environment. With the increasing pace of life, increasing demands on personal time, opportunities for participation in many varied activities, and a demanding schedule of extra-curricular activities for most school-age children, opportunities to be alone and in an environment in which one is in control have become quite scarce. There are reports that drivers may seek out more congested commuting routes to maximize this private time, and that reductions in congestion are not necessarily desired. Further, this attribute of time spent in a car on a regular daily basis creates a predilection to increase the distance between home and work (within limits); it also represents a predisposition to solo driving that no amount of incentives to carpool and disincentives to drive solo are likely to change.

Overall, current market shares, recent trends, and evidence of likely future trends seem to combine to offer a picture in which the transit market share will continue to decline, multiple occupancy of automobiles will likely remain unchanged for the work trip and decline for other trips, and in which solo driving will likely increase, notwithstanding various policy efforts to change these relative shares.

IMPLICATIONS FOR THE FUTURE

Many inferences can be drawn from the preceding sections of this paper in looking towards the future of, particularly, urban transportation. These inferences are based on population demographic trends, evidence of broad policy directions in the transportation and land-use sectors, and market-share trends and mode preferences exhibited by urban residents in the latter part of this century.

Urban public transit is unlikely to succeed in recovering all operating costs from the farebox. Increases in operating costs, hidden subsidies for the car, and the need to provide accessible urban public transit (particularly for low income households) will likely generate a trend towards level or decreasing farebox cost recovery, which currently averages about 40 percent of operating costs in the U.S. Selected routes within an urban area, particularly those that provide transportation to choice riders traveling between home and work, may offer specific situations in which farebox recovery of operating costs may be possible. Such situations will be offset on a systemwide basis by the need to provide mass transit to households and individuals with no car available, and to maintain overall system coverage, including collector/distributor requirements and off-peak services.

Decreasing household size, increasing participation in the workforce, and increasing car ownership combine to create an increasing need for highly flexible and individualized urban area transportation. Commuters need to be able to make intermediate stops between home and work for household and personal needs, and also require an increasing ability to be flexible on times of arriving at and leaving from work. This flexibility is very hard to meet through either public transit or shared riding in a car.

Capital is unlikely to be available to provide significant increases in highway system capacity through additional lane miles. Scarcity of capital and urban land, environmental considerations, and resource constraints combine to make major new highway building unlikely in most U.S. urban areas. New technologies show promise of providing a means to increase the effective capacity of existing highway infrastructure through such procedures as computer controls, congestion management, and incident management. A smaller urban vehicle could also be created, offering all the comfort and amenity requirements of the solo driver, while occupying much less roadscape and providing a level of maneuverability absent from current vehicles. The solo-driven car will probably continue to dominate the urban transportation market, although the technology of the vehicle, its size, and control systems may undergo major changes, as also may the power unit and its fuel.

Notwithstanding these various indicators of automobile dominance in urban transportation, public transit will continue to be needed, particularly to serve segments of the population that cannot afford cars or do not choose to purchase them, those working in the densest portions of the urban area, and those whose value systems do not match the general trend towards increased solo driving. In addition, if steps are taken to correct some of the hidden subsidies for driving through road pricing, market prices for parking, etc., increasing pressure can be created to divert some solo drivers to public transit. It is unlikely, however, that a sufficient pricing level could be imposed to reverse ridership trends on public transit, both because of the variety of needs that are satisfied by the car and because of the political unacceptability of setting prices high enough to force many solo drivers to reassess their choices. This is particularly true in the U.S., where there is a substantial political timidity to interfering significantly in the current pricing structure, as shown by the continuation of substantially lower gasoline prices than in much of the rest of the world, and a reluctance to consider seriously introducing congestion tolls, and other pricing devices that would require the road user to pay much closer to the real costs of using his or her automobile.

Finally in the U.S., there is also a considerable political reluctance to take serious action on land-use planning that might increase the viability of public transit and decrease the viability of solo cars. There are many indications that other countries, particularly in Europe, are willing to implement stringent land-use controls that will increase development densities to a level that is supportive of mass transit, and couple these with regulations that reduce the accessibility of the private car. It is less clear, however, if these land-use controls are sufficient. Some recent evidence from Canada raises some questions about the efficacy of land-use controls. Despite the effectiveness of the Toronto Metropolitan Region in restricting urban sprawl and concentrating development in the vicinity of transit stations and stops, the metropolitan area is increasingly facing many of the same problems of other North American cities that have not succeeded in implementing such land-use controls, namely highway congestion, decreasing transit market shares, and increasing use of solo cars.

A PRESCRIPTION FOR THE FUTURE

Thus far, the primary thrust of this paper has been to explore the evidence of trends and directions that seem well-established at present and to draw these out to their logical conclusions. However, such a picture assumes that there is no willingness to intervene and change the direction of current trends, and that there is no potential for innovative solutions. Such a conclusion is overly pessimistic. Rather, this paper concludes with some suggestions for actions and directions that may change the future and be prescriptive rather than reactive. In keeping with the theme of this conference, the remainder of this paper explores some of the issues relating to the continuation of viable urban mass transit. This is based on the premise that, even with various technological and operational improvements in the private transportation sector, total reliance on private transportation does not represent a desirable future for urban areas anywhere in the world. Rather, a balance between private and public transportation is desired, with the possibility of positioning mass transit to capture a larger share of choice users than is currently the case in much of North America.

Despite the pessimism expressed in this paper about the potential of urban public transit to increase its market share, in the face of lifestyle and value changes, policy directions, and recent ridership trends, there can be no question that urban mass transit remains an essential component of the urban area fabric. The most serious problem facing urban mass transit is the perception that it is not cost-effective and that it has an insatiable appetite for public subsidies. Efforts towards privatization of public transit, or at least contracting out portions of public transit service, are aimed at attempting to introduce new economies and greater efficiencies into this sector of the transportation system.

Before tampering with the current system, however, one must be clear on the extent to which public mass transit is inefficient or overly expensive. Part of the problem seems to stem from the measures of efficiency that are employed. Statistics such as costs per vehicle hour or vehicle mile relate specifically to the cost of a unit of supply and do not relate to service delivery, which is the goal of the transit system. Performance could be measured better by statistics like cost per passenger hour of passenger mile, cost per boarding, or some other similar measure. Again, there are problems in that some of these statistics could be "improved" through degradation of service delivery, so that more research on appropriate performance measures should be undertaken and the results should be used as determinants of system efficiency.

Second, the U.S. relies too much on the use of large buses for all service, while the wholesale privatization efforts in some other countries indicate that the competitive private sector sees better cost control with service delivery provided by much smaller vehicles. Part of the problem may be traced back to these performance measures, and part is clearly a response to the high cost of labor and the extremely high proportion of total operating costs that are labor-related. Except in those markets where large passenger volumes are routinely

carried by specific bus routes, the public perception of service is certainly much higher when small vehicles offer substantially increased frequencies of service. In order for such service to be competitive and efficient from an operator viewpoint, there needs to be research on the best way in which to structure a route system. Possibly, urban mass transit should look to the example provided by the deregulated airlines in North America that have adopted the hub-and-spoke system, and determine if this, in conjunction with the use of small-capacity vehicles for spokes, and large-capacity vehicles for hub-to-hub linehaul movements might provide a better structure offering increased service delivery together with lower costs of operation.

The use of smaller vehicles, with the potential requirement for more vehicles and therefore more drivers, and more motive units requiring maintenance, must focus attention on labor rules and wage rates. In the U.S., there can be little question that the piecemeal privatization, or contracting out of service is a lightly veiled effort at union busting, to the extent that it offers the opportunity to introduce into a union-dominated labor market, a major influx of non-union employees. Whether such an effort can be sustained, or whether the eventual state of affairs in the U.S. will be a return to unionization by drivers working for private entities offering bus services, is not yet clear, although indications are that unionization appears more likely than not.

Unionized drivers and mechanics need, however, to look to the fate of U.S. railroads to see what may happen in the public provision of mass transit services. Retention of outmoded work rules, together with continued claims for higher pay scales will precipitate either the demise of public transit or total privatization, with a concomitant loss of unionized labor positions. Similarly, some U.S. government rules relating to retention of workers and repayment of prior costs need reconsideration to determine if these operate in the nation's best interests towards the provision of efficient public transit. There is abundant opportunity for changes to be made that will have a salutary effect on the efficiency of mass transit, and therefore the potential for mass transit to remain an integral and cost-effective element of urban infrastructure.

Stopher and Spivack¹⁷ examine the concepts of efficiency relating to public transit and note concerns with both productive efficiency and allocative efficiency, where the former relates to internal efficiency and the latter to the external environment within which public transit is provided. The comments above relate primarily to improvements in productive (internal) efficiency. Non of these changes requires privatization in order to be implemented, although privatization may be a useful way to achieve the goal of productive efficiency, if public providers are unable to find the internal impetus to be innovative. However, productive efficiency is not the only goal for the future. Allocative efficiency is also a desirable goal that is not necessarily obtainable through any form of privatization.

Allocative efficiency will result if urban transportation services are marginally cost-priced. For this to occur, several conditions are necessary. First, urban transit service itself must be priced to reflect marginal costs. This means abandoning the North American preoccupation with flat fares and charging fares that are based on distance or time, because distance or time are more accurate measures of the incurrence of costs. Second, the mechanism by which fares are subsidized for low-income users should be changed. Currently, in the U.S., one of the major arguments for not raising fares more than a certain minimal amount is the effect that such fare increases will have on low-income residents and on those on fixed incomes. However, holding down fares is an inappropriate mechanism to achieve the laudable goal of affordable transportation for these population segments. Rather, there should be a direct subsidization to those who need it, while those who can afford to pay the true marginal costs should be required to do so, directly.

Of course, such a strategy of marginal cost-pricing for urban mass transit will succeed only if the competing modes in the urban area are also marginally cost-priced. Auto users receive various hidden subsidies, through parking, general revenue expenditure on highway facilities, etc. In addition, congestion pricing does not occur for the automobile and is essential as a step to achieving allocative efficiency in the urban transportation marketplace. Therefore, increased costs for parking, reflecting the marginal cost of providing parking and which are charged to all users, together with increased user costs, through gasoline taxes or road usage charges, are all necessary as part of the total package that would be aimed at achieving allocative efficiency. Subsidies should be provided directly to those who need them, whether auto or transit users, rather than through general subsidization of those who can as well as those who cannot afford the true costs.

These are some thoughts for policy and research directions that might bring about a different future than current trends suggest. Possibly through some mix of the ideas and strategies outlined here, together with others that may emerge subsequently, the continued decline of mass transit in urban areas can be prevented, and the total dominance by private vehicular transportation reversed. Whether either deregulation or privatization have roles to play in bringing about this future are unclear at this stage. It seems clear that they are not necessary to the achievement of the goals outlined in this section of the paper, although they may be a possible direction in which to proceed. As this author has cautioned before¹⁸, it is important that attention is paid to the history of urban mass

transit and to understanding how the present ownership, provision and production of such transportation came about. There is a clear need to learn from that history and to use those lessons to help seek ways to reverse declining transit ridership into the twenty-first century.

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