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Government Failure in Urban Transportation

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Abstract

This paper assesses governmental performance in its investment, provision and regulation of urban transportation. Attention is given to public bus and rail transit and road transportation. Evidence based on urban transport in US cities reveals substantial allocative and technical inefficiencies that have led to large public transit deficits and severe highway congestion.

I argue that it is futile to expect public officials to remedy the situation by pursuing more efficient policies such as congestion pricing and weighing costs and benefits when deciding transit service. The problem is that urban transportation policy is largely shaped by entrenched political forces that inhibit constructive change. The only realistic way to improve the system is to shield it from those influences and expose it to market forces by privatising it. This position is supported by empirical evidence based on simulations for the US and the UK's early experience with privatisation.

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I. INTRODUCTION

Public provision of urban transportation is, in theory, socially desirable. Rail and bus operations exhibit economies of traffic density that could lead to destructive competition in an unregulated market. Highways are traditionally perceived as public goods that require enormous capital and maintenance investments that the private sector is unlikely to finance. Improving the urban mobility of elderly and low-income citizens is an important social goal that should be addressed by government. But in their official capacity as regulators, service providers and investors, public officials have generally instituted policies that have led to inefficient and inequitable urban transportation. A case for privatising urban transport is developing because these actual government failures most likely outweigh potential market failures.

Governmental involvement in the transportation systems of US cities illustrates the problem. Local governments, with state and federal financial support, are quasi-monopoly providers of urban bus and rail transit. Most US roads and bridges are owned and operated by federal, state or local governments. How has the public system performed? City roads are jammed at an ever expanding rush hour, causing infuriating delays. Bus service, never fast, has deteriorated over the years, while fares have risen. Pressures to expand rail service to outlying suburbs remain strong, even though current rail operations cannot attract enough riders to cover more than a small fraction of their total expenses including capital costs.

Popular opinion seems to be that the US can — and should — spend its way out of this mess by building more roads, running more buses and installing more track. Indeed, in the Transportation Equity Act for the 21st Century, T21 for short, Congress greatly increased federal support for transit and highways for 1998–2003. Many transportation analysts are sceptical and argue that, although more public spending for urban transport may result in some improvements for travellers, its primary effects will be to swell transportation deficits and waste tax revenues. Instead, they suggest that government pursue more 'efficient' policies such as charging motorists for the congestion they cause and balancing costs and benefits when deciding transit frequencies, route coverage and vehicle sizes.

I have come to believe that it is futile to expect public officials to consider such changes because urban transportation policy is largely shaped by entrenched political forces. The forces that have led to inefficient prices and service, excessive labour costs, bloated bureaucracies and construction-cost overruns promise more of the same for the future. The only realistic way to improve the system is to shield it from those influences and expose it to market forces by privatising it. Preliminary evidence from the UK and elsewhere suggests that, although a private urban transportation sector should not be expected to perform flawlessly, it could eliminate most government failures and

allow innovation and state-of-the-art technology to flourish free of government interference. The real uncertainty is what could spur policymakers to initiate change.

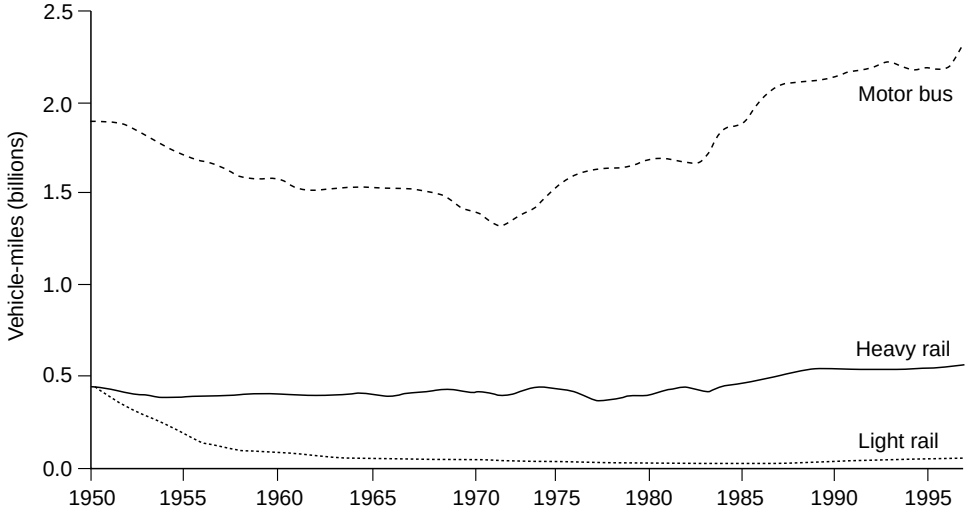
II. THE EVOLUTION OF THE US URBAN TRANSIT SYSTEM

The US government began subsidising urban transportation in the 1950s, funding urban extensions of the interstate highway system. Then, in response both to the deteriorating financial condition of private transit — an issue to which I will return — and to arguments by big-city mayors that subsidising transit would be more cost-effective than building highways, Congress passed legislation in the early 1960s that helped cities buy their transit companies. Federal operating subsidies followed in the 1970s. Today, most operating assistance comes from state and local governments, while Washington shoulders most capital investment.

Growing federal support of mass transit slowed the long-run decline in the use of buses and light-rail systems — trolleys and streetcars (Figure 1). By the

FIGURE 1

Heavy- and Light-Rail and Motor-Bus Vehicle-Miles[a]



[a]A number of smaller and rural systems are excluded before 1984.

Sources: American Public Transit Association – *1997 Transit Fact Book* (for 1984–95), *1991 Transit Fact Book* (for 1975–83), *1974–75 Transit Fact Book* (for 1960–73), *1981 Transit Fact Book* (for 1974) and *Transit Fact Book 1960* (for 1950–59).

TABLE 1

Journey-to-Work Passengers and Mode Shares in US Urban Areas with Population Greater than 1 Million

Mode	*1960*	*1970*	*1980*	*1990*
Millions of workers				
Privately owned vehicle	17.5	27.6	36.5	49.8
Bus	3.8	3.3	3.0	2.9
Subway / Rail	2.3	2.2	2.0	2.3
Walk	3.0	2.7	2.1	2.2
Other	5.2	1.2	1.7	2.4
Percentage of workers				
Privately owned vehicle	61.0	74.4	80.4	83.5
Bus	13.1	9.0	6.7	4.9
Subway / Rail	8.0	5.9	4.5	3.8
Walk	10.4	7.4	4.7	3.8
Other	7.5	3.3	3.7	4.0

Note: The 'other' category in 1960 and 1970 passenger trips includes walking, taxi, motorcycle, bicycle and respondents who work at home. The 'other' category in other years and in mode share includes these modes except walking. The mode share data for walking in 1960 and 1970 are based on US data rather than major urban area data. The set of major urban areas with population exceeding 1 million changes by decade.
Sources: Federal Highway Administration, *Journey-to-Work Trends in the United States and its Major Metropolitan Areas 1960–1990*, 1993, from census data; Federal Highway Administration, *Journey-to-Work Trends, based on 1960, 1970 and 1980 Decennial Censuses*, 1986; and author's calculations.

late 1970s, federal subsidies had expanded bus and heavy-rail capacity.[1] Capacity has continued to increase in the past two decades, but other trends have revealed ominous weaknesses in service (Winston and Shirley, 1998). Many cities have cut bus frequency on their core routes to extend service to the suburbs. Many others, including New York, Chicago and San Francisco, have cut rail-service frequency and raised real fares. Indeed, since 1980, real transit fares per passenger-mile have increased 54 per cent.[2] Although federal support of public transit was intended to lure urban travellers from their cars, the share of commuters who use bus and rail has diminished since the 1960s. Rising incomes and suburban sprawl have reinforced commuters' preferences for their automobiles, causing autos' share of work trips to climb to nearly 84 per cent by 1990 (Table 1).[3] Between 1960 and 1990, mass transit's share of *all* trips in large

[1]It would be preferable to measure bus and rail capacity in terms of seat-miles instead of vehicle-miles. Information on seat-miles, however, is only available from the American Public Transit Association since 1980. Based on these data, bus and heavy-rail seating capacity has remained relatively constant, while light rail's seating capacity has increased somewhat. Thus using vehicle-miles instead of seat-miles understates the recent growth of light-rail capacity but does not have much impact on the growth of bus and heavy-rail capacity.
[2]American Public Transit Association, *Transit Fact Book*, various issues.
[3]These mode shares are based on decennial censuses. Mode shares based on the 2000 census are not yet available.

urban areas, where transit service should be most attractive, fell from more than 20 per cent to less than 10 per cent.[4] Transit's high share of empty seats attests to its inefficient operations. In the mid-1990s, rail filled roughly 18 per cent of its seats with paying customers, buses roughly 14 per cent (Winston and Shirley, 1998).

Public transit's long-run growth in capacity and decline in patronage have helped create deficits that are a serious drain on the public purse. By 1997, transit operating expenses in the US were about $19 billion a year, almost twice the yearly $10.6 billion in operating revenues. Continuing capital investments are swelling this deficit (1998 capital subsidies amounted to $7.4 billion).[5] Government involvement portends better things for special interests than for travellers. According to Pickrell (1985) and Lee (1987), as much as 75 per cent of federal spending on mass transit ends up in the pockets of transit workers (as above-market wages) or goes to suppliers of transit capital equipment (as higher profits and interest). Just 25 per cent is used to improve transit and lower fares.

Although transit use has increased during the current US economic expansion, transit's market share has kept falling.[6] Moreover, according to data from the National Transit Database, transit use was lower in 1998 than in 1989. None the less, with growing government support for transit, cities will find it easier to build new (light) rail systems or extend existing ones, ensuring that transit deficits will grow even larger.

A fundamental problem with rail construction projects is that ridership tends to be grossly overestimated at the planning stage, while capital and operating costs are underestimated. For example, after breaking ground in 1986, the new Los Angeles Red Line (light-rail system) finally opened in June 2000. The 17.4-mile system, costing more than $4.5 billion, now hopes to lure only 100,000 riders a day in a county with 10 million residents.[7] The system was originally intended to be much larger and carry more passengers, but after years of construction delays and cost overruns and faced with cost projections of some $75 billion over the next 20 years, Los Angeles voters decided in 1998 to block further use of local sales tax revenue for subway construction, effectively preventing expansion of the current Red Line.

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[4]Passenger counts and mode shares for all types of trips are available from the US Federal Highway Administration, *Personal Transportation Survey*, Department of Transportation, 1990. Because the sample sizes are generally considered small, national estimates derived from these data should be regarded as preliminary. None the less, the data reveal trends and magnitudes that are consistent with those based on reliable samples of work trips.

[5]Operating subsidies are from the American Public Transit Association, *1998 Transit Fact Book*, Washington DC, and capital subsidies are from the National Transit Administration, *National Transit Database*, US Department of Transportation.

[6]Wendell Cox, 'Report of public transit's "record" ridership questionable', June 2000 (available at www.heritage.org).

[7]Todd S. Purdum, 'Los Angeles subway reaches end of the line', *New York Times*, 23 June 2000, p. 1.

Public transit authorities face growing financial pressures to maintain rail operations as these systems age. For example, the Washington, DC, Metro subway system, which began service only in 1976, is struggling with equipment breakdowns, such as broken escalators and failed relays, and water seepage that is crippling power and communications systems and track infrastructure at an alarming rate. When faced with the likelihood that money would not be available over the next several years to make all necessary repairs and purchase additional equipment, regional planners concluded that far more people will have to drive cars than previously projected.[8]

In retrospect, the US public transportation experiment has been a major disappointment and done little to stem the growth of automobile travel. Policymakers are now confronted with the rising costs of this experiment.

III. US URBAN HIGHWAYS

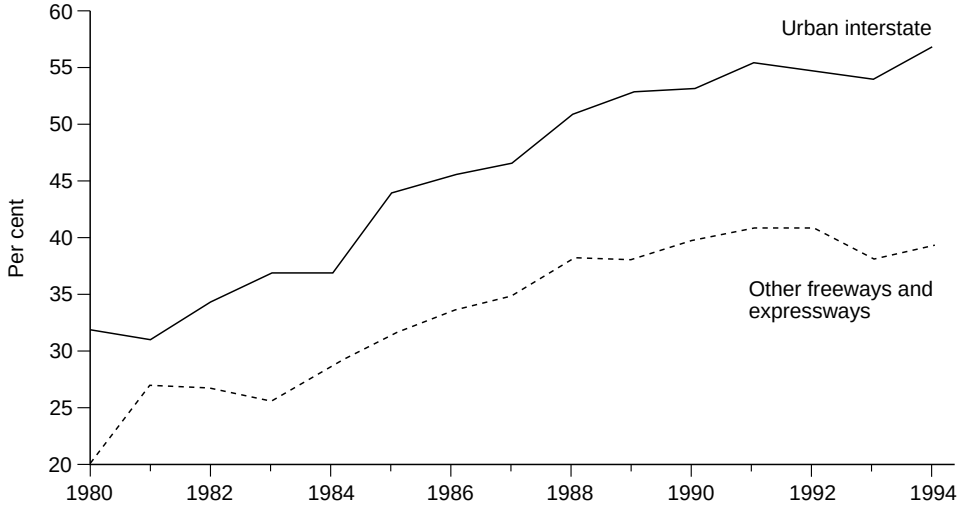
The US has invested hundreds of billions of dollars — primarily from gas taxes (i.e. road fuel taxes) — in building and maintaining roads to accommodate auto and truck travel, but, like rail transit investments, the cost of some urban road projects has turned out to be much greater than anticipated. The most glaring example of cost overruns is the so-called Big Dig depression of Boston's central artery, considered to be the largest public works project in US history. Originally projected to cost $2.3 billion in 1984, it is now expected to cost $13.6 billion when finally completed in 2004, but even that figure could rise.[9] At a smaller scale, but indicative of the extent of the problem, transportation officials in the Washington, DC, region acknowledge that the cost of replacing a major highway interchange known as the 'Mixing Bowl' has ballooned from $350 million to $509 million and become the region's most expensive highway project. Officials fear costs could run higher and stall other transportation projects.[10]

The motoring public is less knowledgeable about construction cost overruns than about the increase in urban automobile congestion. Vehicle-miles travelled in urban areas increased 82 per cent from 1980 to 1997, while urban road mileage increased only 33 per cent.[11] The share of urban highways with peak-hour traffic volume exceeding 71 per cent of design capacity — a common indicator of congestion — increased steadily during the 1980s to more than 50 per cent of urban interstate miles and 40 per cent of other freeway miles (Figure 2).[12] Although workplace and residential adjustments during the 1990s, such as

[8]Alan Sipress, 'Transportation plan reveals funding gap', *Washington Post*, 13 July 2000, p. 1.
[9]Pamela Ferdinand, 'Boston's "Big Dig" buried in cost overruns', *Washington Post*, 12 April 2000, p. A3.
[10]Alan Sipress, 'Springfield interchange price tag rises 45%', *Washington Post*, 15 June 2000, p. B1.
[11]US Federal Highway Administration, *Highway Statistics*, various years.
[12]Measures of congestion after 1994 are based on a change in capacity calculation procedures, which makes it difficult to compare congestion in 1995 and years thereafter with that in previous years.

FIGURE 2

Urban Road Miles at Over 71 Per Cent Capacity in Peak Periods



Source: Table HM-61, Federal Highway Administration, *Highway Statistics*, Department of Transportation, various years.

working and living in outlying suburbs, have helped stabilise urban congestion, the current annual costs to travellers, mainly in the form of wasted time but also in the form of extra consumption of gasoline and vehicle wear and tear, have been estimated to run as high as $40 billion. The annual cost of congestion to shippers, in the form of higher inventories and more goods stuck *en route*, adds considerably to this figure.[13]

Even when roads are widened to keep up with demand, the expanded roads shortly fill to capacity. For example, the Montgomery County, Maryland, transportation director pressed the Maryland state government to widen its Interstate 270 six years ahead of schedule to accommodate growing traffic. Maryland responded with $200 million to widen more than a dozen miles of I-270, up to 12 lanes in some stretches. But less than eight years after the project was finished, county officials describe the highway as 'a rolling parking lot'.[14]

The US road system represents the nation's largest civilian public investment. None the less, congestion appears to have become an intractable problem

[13]Estimates of the costs of automobile congestion to travellers are produced by the Texas Transportation Institute at Texas A&M University.

[14]This is partly an outcome of Downs's (1962) law: on urban commuter expressways, peak-hour traffic congestion rises to meet maximum capacity because commuters shift from less preferred modes and times of day.

because public expenditures to expand urban road capacity cannot keep up with growing automobile travel.

IV. ECONOMIC INEFFICIENCIES OF CURRENT URBAN TRANSPORT POLICY

The traditional theoretical justification for government management and operation of transit is that a private transit market would result in destructive competition.[15] Public transit agencies could maximise social net benefits by setting travellers' fares equal to the marginal cost of their trips and providing service, such as frequency and route coverage, where additional benefits to travellers equal the additional costs.[16] Government ownership and management of roads is justified on the grounds that roads are (for the most part) public goods that require enormous investments. Given congestion and road surface wear, the public highway authority could maximise social net benefits by charging users for the particular costs they incur and by making investments where marginal benefits equal marginal costs.

TABLE 2

Effects of Efficient Urban Transportation Pricing and Services in the US

Billions of 1998 dollars

Assumption and mode	*Consumer benefits*	*Government balances*	*Net benefits*
Efficient pricing only			
Auto, bus and rail total	–16.0	23.9	7.9
Auto toll	–8.2	12.0	3.8
Bus	–4.3	7.0	2.6
Rail	–2.4	2.8	0.4
Efficient pricing and optimal service frequency			
Auto, bus and rail total	–16.2	29.3	13.0
Bus	–4.3	11.7	7.3
Rail	–2.8	4.3	1.6

Source: Winston and Shirley, 1998.

[15]Government intervention has also been justified on the grounds of 'Hotelling' bunching — competing transit companies would arrive at bus stops or rail stations at the same time. Bunching, however, occurs quite frequently in most public transit systems.

[16]If transit companies operate where there are increasing returns to scale, this first-best policy will require some subsidy because marginal costs are below average costs. If no subsidies are available (an unlikely situation in public transit), then Ramsey pricing represents the efficient second-best policy where the percentage mark-up of fares above marginal cost is inversely related to travellers' demand elasticities subject to a break-even constraint.

Large public transit deficits, low transit load factors and severe highway congestion, however, suggest that the US public sector is not setting urban transportation prices and service to maximise net benefits. Winston and Shirley (1998) explore this matter empirically by estimating the net benefits from two policies: replacing current transit prices and service frequency with marginal cost transit fares and optimal service frequency; and setting marginal cost automobile congestion tolls.[17] (The tolls, which can be assessed with current technology that does not disrupt motorists' journeys or invade their privacy, account for travellers' value of time and vary with the level of congestion throughout the day.) Policy simulations are based on an equilibrium model of urban transportation pricing and service where urban commuters choose among alternative modes (auto, bus, rail, taxi or car pool) and departure times. The effects of the pricing and service policies on consumer benefits and government balances are shown in Table 2.[18]

The net benefits from implementing only the pricing components of this policy total nearly $8 billion a year. Because optimal pricing means much higher fares and tolls, travellers themselves lose $16 billion.[19] But these private losses are more than offset by the reduced public transit deficits and accumulated toll revenues that bring the urban transportation budget into balance. It is, of course, questionable whether the average citizen will see benefits in policies that increase his or her costs, even as they lower public deficits. But voters are demonstrably inclined to support elected officials who reduce government spending (Peltzman, 1992; Winston and Crandall, 1994), so travellers wearing their hats as taxpayers would likely vote for their enlightened self-interest at the ballot box. In fact, the benefits noted in Table 2 are understated because they do not account for the cost of raising public funds (excess burden) to cover the transit deficit.

Some policymakers and analysts have tried to justify transit subsidies on second-best efficiency grounds because auto travel is implicitly subsidised — that is, travellers' costs of using their automobiles do not include the costs of congestion, pollution and the like. But the findings show that overall urban transportation efficiency would improve if *any* mode's prices were aligned with its marginal costs. Current transit fares are so out of line with costs that marginal cost pricing would reduce economic waste, even if the price of using auto travel remained unchanged. By the same token, raising the cost of driving to account

[17]Optimal service frequency is the level of bus and rail frequency that maximises net benefits, which are composed of the changes in travellers' benefits, congestion toll revenues, bus revenues and costs, and rail revenues and costs.

[18]Consumer benefits are measured by compensating variations that are based on the joint choice model of mode and departure time. Changes in government balances are based on changes in bus revenues and costs, rail revenues and costs, and toll revenues.

[19]Congestion pricing provides benefits to peak-period auto travellers in the form of shorter travel time. The losses to travellers are net of these benefits.

for congestion without raising mass transit fares would also increase overall urban transportation efficiency.

Net benefits to society would climb to $13 billion a year if service frequency as well as prices were adjusted to maximise net benefits. Current transit frequency is excessive because of low ridership and oversized vehicles. Thus cutting frequency generates benefits because public deficits are reduced by more than the value of service lost to urban travellers.

Government's failure to set efficient prices and service frequency for bus and rail transit and set optimal tolls for auto travel has generated large social costs, but these are only part of the allocative inefficiencies created by government involvement in urban transportation. Inefficiencies have also arisen because transit's service offerings are not optimised in other areas such as route coverage and because highway charges do not reflect the road damage caused by trucks.[20]

Public authorities have also failed to keep down the cost of urban transit service. The large share of empty bus and rail seats is one indication that costs are too high.[21] This excess capacity also prevents transit from realising its competitive advantage over auto. Transit's average operating costs per *seat*-mile are lower than auto's, but its empty seats drive its operating costs per *passenger*-mile above auto's (Winston and Shirley, 1998). Other indications of transit inefficiency include excessive wages (the typical Washington, DC, Metrobus driver, for example, gets paid twice as much as drivers for the handful of private bus companies in the DC area) and declining productivity. Lave (1991) estimates that transit productivity has fallen 40 per cent since the public take-over in the mid-1960s.

Travel on urban thoroughfares is also not produced at minimum cost. Roth (1996) argues that highways make inefficient use of their capacity and actually run a substantial deficit when depreciation of highway capital is taken into account. Small, Winston and Evans (1989) found that highway pavement is generally too thin, which raises maintenance costs. Public management of construction projects also raises costs because bureaucratic rules prevent the government from using the latest technologies, causing some investments to need upgrading shortly after completion. Project managers also specify detailed regulations that force contractors to adhere to the letter of the contract instead of

[20]Road damage depends on a truck's weight per axle (the more axles a truck has for a given load, the less road damage) and should be covered by a user charge per mile based on axle weight. Small, Winston and Evans (1989) estimate that the efficiency improvements from replacing the gas tax, which is currently used to charge trucks for highway use, with an axle-weight tax amount to $8 billion (1996 dollars), using a GDP inflator. With respect to efficient pricing of other transport externalities, Winston and Shirley (1998) find there would be small net benefits from charging travellers for the cost of accidents and pollution.

[21]Transit's inherent operations — gradually increasing ridership in the primary commuting direction and consistently low ridership for the reverse commute — suggest that even an efficient transit system is unlikely to achieve average load factors that exceed 50 per cent. But public transit's average load factor is far below that figure and has been declining for some time. It was 22 per cent in 1975, 18 per cent in 1985 and 16 per cent in 1995.

seeking higher-quality, efficient alternatives. Finally, highway labour costs have been elevated by the Davis–Bacon Act, which requires that prevailing union wages must be paid on all federal construction contracts.

The legislative process also encourages waste. At the federal level, transportation bills are loaded with demonstration or 'pork barrel' projects to ensure passage (T21 is larded with some $9 billion of pork). A notorious example is the stretch of I-99 connecting Wolfsburg and Bald Eagle, Pennsylvania. Dubbed the Bud Shuster highway after the influential local congressman, the road carries less traffic in a year than the Washington, DC, Capital Beltway carries in three days. None the less, Shuster supports extending it to the tune of $400 million.

For their part, state and city officials tend to prefer urban transportation projects that entail a large federal contribution over those that could yield greater social benefits. In addition, federal legislation in 1991 may have encouraged local officials to understate the potential costs of their projects by requiring that regions craft transportation programmes that included only those road and transit projects that had lined up funding. When the true, as opposed to wishful, costs of these projects have become apparent, officials have delayed other projects.

Until analysts better understand how both mass transit and auto can benefit travellers, it is premature to say whether a more efficient urban transportation system would shift travellers from mass transit to auto, or vice versa. Given the inescapable reality that the delivery of urban transportation by the public sector is creating substantial allocative and technical inefficiencies, researchers should consider how each mode's operations would improve in a privatised environment. Unfortunately, many analysts are preoccupied with how mode shares would change if policymakers followed their advice on how to design a 'better' public urban transportation system. What they fail to recognise is that current inefficiencies in the public sector are not simply an historical accident that can and will be easily corrected, but rather the predictable result of powerful political forces that are unlikely to change.

V. POLITICAL FORCES IN URBAN TRANSPORTATION

It is no secret that policymakers — appropriately — respond more to political forces than to market forces. Thus the subsidies that have become a fixture in urban transit largely accrue to powerful interests — higher wages to labour, including managers, operators and station agents, and higher profits to suppliers of transit capital. But a portion does go to keeping fares below cost and expanding service beyond what could be supported without subsidies. Winston and Shirley (1998) link much of transit's pricing and service inefficiencies with patrons' political influence: upper-middle-income rail riders benefit from more frequent service and route coverage, lower- and middle-income bus riders get more frequent service, and so on. Indeed, the recent debate about where to put

the Red Line and new rapid bus lines in Los Angeles was more about the strength of homeowner groups and less about where the lines best integrate with the city.[22]

Transit inefficiencies might be more easily overlooked if they redistributed income from the well-to-do to the poor. But with the average annual household income of bus commuters approaching $40,000, with the average annual household income of rail commuters exceeding $50,000 and with train operators and station agents for the BART system in San Francisco, for example, being paid more than $40,000 a year, the poor are hardly transit's greatest beneficiaries.[23]

Highway spending also responds to strong interest groups, 'pork barrel' projects being an obvious example.[24] To maintain political support for a national highway system, the allocation of funds for highway repairs appears to be based on formulas that are biased in favour of (rural) states with relatively low highway use (Johnson and Libecap, 2000). In some cases, highway construction has been slowed because neighbourhoods (in Boston and San Francisco, for example) resist demolitions for expressways that will mostly serve suburban commuting to downtown.

Efforts to implement congestion pricing on public highways have also been held hostage by politics. For example, a dispute between California public agencies and the state legislature over the redistribution of toll revenues prevented a congressionally authorised congestion toll experiment from being implemented on the San Francisco Bay Bridge (Shmanske, 1996). Given the wasteful spending of transportation funds, perhaps a silver lining in the nation's failure to introduce congestion pricing is that the 'pot of gold' represented by congestion toll revenues has not materialised in the public sector.

A fundamental question is how much travellers are willing to pay to save travel time by having road authorities set congestion tolls on highways. Calfee and Winston (1998) and Calfee, Winston and Stempski (forthcoming) suggest that automobile travellers' willingness to pay is much lower than once thought and that most travellers do not appear to value travel time savings enough to benefit substantially from optimal tolls. But it is clear in certain situations that auto travellers would be willing to pay considerable sums to travel faster. For example, a solo driver who was fined $50 for using a car-pool lane on a freeway

[22]Glenn Gritzner and Katherine Perez, 'Something is missing in this Red Line picture', *Los Angeles Times*, 10 July 2000, p. 1 metro.

[23]Winston and Shirley (1998) summarise evidence concluding that public transit programmes such as reverse commuting, which are designed to give low-income people greater access to suburban jobs, have not met with much success.

[24]Evans (1994) shows that the inclusion of highway demonstration projects is important to securing passage of legislation authorising the nation's highway and transit programmes.

in the Washington, DC, area viewed the fine as 'not a lot of money to pay to get to work an hour earlier'.[25]

Policymakers' preferred method of combating congestion has been to build more roads. Less politically expedient policies such as charging motorists efficiently for road use find less favour.[26] Car-pool lanes have been tried in some urban areas, but it is not clear whether these increase or decrease congestion. As funds for new roads are inevitably outstripped by demand and additions to existing roads fill up quickly with traffic, many urban officials are spending hundreds of thousands of dollars on commissions to 'study' ways to reduce congestion. But at least one commission concluded that political obstacles seem to put any strategy out of reach.[27]

US policymakers at all levels of government have shaped an urban transportation system that benefits specific travellers and suppliers, but whose welfare costs are borne by all taxpayers. As long as transit is provided by the public sector, it is hard to see how the political forces that contribute to its current allocative and technical inefficiencies could be overcome. Efforts to improve the efficiency of public roads are also hamstrung by politics. Apparently, the federal government sees no reason to change matters because the T21 legislation indicates there will be no break with past transit or highway policy. Privatisation is therefore starting to be seen in a different light and is slowly attracting interest among transportation analysts as the only realistic hope for paring the huge inefficiencies that have developed in urban transportation under public management.

VI. BUILDING THE CASE FOR PRIVATISATION

Privatisation and deregulation could transform the US urban transportation system in the same way that deregulation has transformed US intercity transport. Starting in the mid-1970s, deregulation of the railroad, trucking and airline industries gave each the incentive and ability to become more efficient, innovative and responsive to customers, generating more than $50 billion in annual net benefits to consumers (Winston, 1998). Given deregulation's bipartisan political support, it is puzzling that privatisation conjures up ideological connotations among some policymakers instead of hope that it, combined with deregulation, can solve government failures. In fact, there is ample evidence that market forces in urban transit could accomplish a great deal

[25]Alan Sipress and Josh White, 'Guilty, but feeling guilt-free', *Washington Post*, 16 July 2000, p. A1.

[26]Similarly, policymakers have only addressed road damage by repairing roads. They have not pursued efficient road wear taxes that would encourage truckers to shift to trucks that do less damage to the roads.

[27]Peter Behr, 'Area leaders hit traffic roadblock: political obstacles hamper solutions to driving woes', *Washington Post*, 28 September 1997, p. A1.

of what public officials have been unable or unwilling to do. A conceptual case for privatising roads can be made, but it needs empirical analysis.

1. Urban Transit

It is true that the federal government got involved in urban transit during the 1960s because private transit failed. But Pashigian (1976) and Hilton (1985) provide evidence that private bus operations failed because they were weakened by government regulation. Meyer and Gomez-Ibanez (1981) point out that federal policy almost made it mandatory for cities to acquire their private transit companies instead of allowing them to raise fares to become more profitable. In response to those who claim that public transit's vehicle size and scale economies imply competition is unworkable in a private market, Walters (1982) argues that the extent of these economies indicates that public transit's operations are plagued by excess capacity. Such inefficiencies could be substantially eliminated in a private market where operators have the incentive and ability to improve their operations.

Just how would privatisation and deregulation reduce transit pricing and service inefficiencies? Winston and Shirley (1998) construct a model in which existing bus and rail companies are forced to compete with each other as well as automobiles and set prices and service frequency to maximise profits. They find that the effects of such competition are remarkably similar to the effects of marginal cost transit pricing and optimal service frequency. Society's gains from eliminating transit deficits — private carriers would earn profits — would substantially exceed travellers' losses from higher fares and reduced service.

These findings, however, greatly overstate the potential losses to travellers because they do not reflect the improvements in operations, marketing and service that could be achieved by private transit and the impact that new entrants would have on fares and service.

Deregulation of intercity transportation revealed that regulation had substantially raised carriers' costs and inhibited marketing and service innovations (Winston, 1998; Morrison and Winston, 1999). Given the freedom and incentive to use the latest technologies to improve routeing, scheduling and vehicle design, private transit companies could substantially raise load factors and improve productivity. Greater competition would put downward pressure on labour and capital costs. Such influences drove deregulated railroads', airlines' and truckers' real operating costs more than a third lower than they had been under regulation. It is likely that transit operating costs would decline similarly if bus and rail companies were privatised.[28]

[28]Indianapolis is one of the few US cities that has privatised its transit system. Karlaftis and McCarthy (1999) estimate that, although the system is producing more vehicle-miles and passenger-miles, its operating costs have declined 2.5 per cent annually since privatisation. These savings are primarily efficiency gains, not transfers from transit labour.

Under deregulation, airlines accelerated development of hub-and-spoke route structures to increase flight frequencies, railroads introduced double-stack trains and made greater use of intermodal (truck–rail) systems to improve service times, and truckers developed high-service megacarriers. Railroads and truckers also contracted with shippers for special services, such as expedited pick-up and delivery to facilitate just-in-time inventory policies. Similar service innovations by privatised bus and rail transit companies would also benefit travellers. Possibilities include new non-stop express van and bus services, specialised scheduled and non-scheduled van services, and door-to-door services.[29] Private bus and rail companies might also find it profitable to offer premium higher-fare service with seat and schedule guarantees. Transit service innovations could generate improvements in land use too, something rarely achieved by public transit (Pickrell, 1999).

These innovations go beyond what John R. Meyer characterises as 'transit's streetcar mentality' — scheduled stops by large buses or rail cars along a fixed route under all travel conditions. Transit operators, for example, might improve efficiency and service to travellers by providing looped express bus operations — turning some buses short instead of running all buses the full length of the route — and running minibus operations on the outer (lower-density) parts of the route (see Kerin (1990)). Indeed, as I discuss later, intensive minibus operations have been a beneficial outcome of British bus privatisation.

The deregulation experience has also shown that new market entrants, such as Southwest Airlines, often become the most efficient firms in a deregulated industry. In the transit industry, privatisation could lead to intense competition supplied by paratransit operations, such as jitneys, and other low-cost operations, such as minibuses. Competition among these new entrants and conventional bus, rail, taxi and auto modes would ensure that cost reductions would become fare reductions.[30]

Unlike airlines and trucks, railroads were deregulated because of their poor financial performance under regulation. It was expected that, in pursuit of greater profitability, the deregulated railroad industry would substantially reduce its operations, raise rates on much of its bulk freight and cede a lot of manufactured freight to truck. Railroads have indeed pruned their systems, but they have also become more efficient and responsive to customers — offering lower (contract) rates and better service. Thus instead of losing market share, deregulated railroads are actually carrying more freight, regaining market share and increasing their earnings. Depending on the behaviour of new entrants and what

[29]See, for example, Volpe National Transportation Systems Center (1998).

[30]It would be desirable to deregulate taxis as part of a broader strategy to stimulate competition in urban transport. No longer enjoying a secure niche between the private car and the city bus or rail service, taxis would be forced, for example, to compete with vans that operate like taxis and offer links with rail and bus operations. The increased competition and co-ordination in the new urban transit system should lower taxi fares, improve service quality and enable taxi operations to impose some competitive pressure on transit.

is done with the established transit authorities, there are numerous possibilities for how a privatised transit industry would supply peak and off-peak service.[31] None the less, the railroads' experience suggests that an efficient transformation of the transit industry's operations, technology, pricing and service could increase transit use and relieve taxpayers of subsidising transit's operations.

From a political perspective, deregulation succeeded because its benefits did not accrue to the rich at the expense of the poor. To be sure, some travellers and shippers benefited more than others, but the distribution of benefits generally had a rational economic basis. Public transit authorities have not aggressively pursued, let alone achieved, laudable social goals such as improving the urban mobility of the poor (Winston and Shirley, 1998). Thus a private system would not threaten to undermine any socially desirable income transfers. In fact, a private system may benefit low-income travellers because carriers would have the financial incentive and ability to develop a market for such customers. For example, Queens Van Plan, a private company, developed a highly valued and profitable service for low- to middle-income minority workers in New York's Queens and Nassau counties, who were largely neglected by public transit.[32]

2. Roads

Public highways are characterised by pricing and design inefficiencies, inflated labour costs and expenditures on new construction and repair, and wasteful projects. Public authorities' delays in adopting technological innovations that could substantially improve the speed and safety of highway travel may also emerge as a large social cost.

At this point, the appeal of highway privatisation in US cities and intercity stretches is conceptual. Empirical evidence on its potential effects is not yet available. Thus I believe it is premature to recommend privatising US highways, but it is worth thinking about how market forces could reduce highway inefficiencies.

Let us begin with pricing. The conventional criticism of current road pricing is that it does not account for congestion. I have presented estimates of the benefits of congestion pricing in the US based on an average value of travellers' willingness to pay to save travel time. However, travellers differ — sometimes greatly — in how much they are willing to pay for transport capacity. For example, in airline travel, some business travellers are willing to pay the large costs that airlines incur for making seats available to them when they travel at the last moment. At the other extreme, some pleasure travellers make an effort to

[31]One strategy transit companies might pursue is to set capacity for off-peak periods and rely on part-time labour to develop peak capacity with extra scheduling and looping. Competition from private jitneys and other services with scheduled bus operations could be gradually introduced following the property rights approach developed by Klein, Moore and Reja (1997).

[32]Hector Ricketts, 'Roadblocks made just for vans', *New York Times*, 22 November 1997, p. A15.

get low fares by planning their trips far in advance and being flexible about which day of the week they can travel. Other air travellers have preferences and constraints that fall between these extremes, and their fares are set accordingly. Thus by offering a range of fares and associated travel restrictions, the deregulated airline industry has greatly improved the use of its aircraft capacity and benefited travellers.

Some highway commuters are willing to pay a great deal to get to work much faster on a particular day, while others are not willing to pay much to speed up their trip. Highway capacity could be used more efficiently if motorists were offered a range of prices and service levels (for example, travellers could choose among high-priced lanes with little congestion and lower-priced lanes with more congestion).

In fact, a few US highways have made a start in this direction by introducing value pricing. An example is the high-occupancy-toll (HOT) lanes on I-15 near San Diego, where solo drivers pay a toll to use less-congested car-pool lanes. By varying over the day, the toll more accurately reflects the value the road provides over alternate routes. But as pointed out by Small (2000), second-best pricing distortions may arise in highway travel because one or a few lanes are tolled but free alternate lanes and routes are close at hand. The efficient (first-best) policy would be to price all lanes (and alternate highways) in accordance with traffic conditions and travellers' willingness to pay to save travel time.

Could competition among highways develop and produce efficient tolls? New Zealand is considering a bold first step, called commercialisation, where the government turns its roads over to commercial road companies, which would be expected to charge for their use and earn a return on capital while being regulated as public utilities. Such a policy would be problematic in the US, where government regulation of public utilities is renowned for creating inefficiencies. Others have suggested that the US government franchise highways to private companies, although the devil would still be in the operating and financial constraints that the government placed on franchised companies and whether competition could evolve given these constraints.

Intercity deregulation offers a potentially useful analogy for solving this problem. Deregulated carriers have had to compete against each other, and in a certain sense against consumer 'organisations'. For example, railroads set most of their rates through contract negotiations with shippers. Among other factors, rates are affected by a shipper's traffic volume and competitive options. Shippers can improve their bargaining position by increasing their traffic volume as part of a group of firms that negotiates rates and by playing off one railroad against potential sources of competition. Such sources include other railroads in the market, other railroads reasonably close to the shipper, plants that compete with the shipper's plant in the product market, alternative origins from which the receiver could use alternative railroads to receive a product, alternative modes such as truck and barge, and so on. By enhancing their bargaining power,

shippers can fully realise the benefits of rail-freight competition. Similarly, the benefits of airline competition are enhanced when travellers negotiate as a group to get lower fares or encourage a new entrant to provide service when they are dissatisfied with incumbent carriers.

Could highway users help road competition develop by organising as bargaining units that negotiate prices and service? Suppose the government distributes roads to commercial companies, as in commercialisation, but aims to allocate potentially competitive intercity stretches (for example, California's Highway 101 and Interstate Route 5) and urban freeways and arterials to different companies. As in the railroad industry, a 'contract equilibrium' could develop where private companies negotiate prices (long-term contracts) with private organisations representing motorists, truckers, railroads, private transit companies and public sector transport. Public and private users *en masse* would therefore be able to bring competitive discipline on prices.

What would these prices look like? Customer groups would likely prefer a range of prices and levels of service. For example, Federal Express and other time-sensitive companies would want a lane (or even separate roads) to be available at a premium price, and time-sensitive automobile travellers would probably be willing to pay high tolls for travel on a less congested lane. It would take time for private road companies to explore various services that users were willing to pay for and for users' preferences to crystallise. But after that transition, the benefits could be large. Firms, and ultimately consumers, and households would gain from travel time savings. Out-of-pocket highway travel expenses would increase, especially for those who desire premium uncongested service, but price increases would be mitigated by, and taxpayers, in general, would benefit from, the lower cost of building, maintaining and operating highways.

Profit-seeking private road companies would have strong incentives to shed the inefficiencies developed over decades in the public sector. Cost-cutting measures would include using axle-weight truck taxes to charge for road damage, building stronger roads, placing much more control over construction and repair expenditures, reducing wages and managerial waste, and eliminating politically motivated projects.

Private road companies could improve the speed and safety of urban (and intercity) highway travel by implementing an intelligent transportation system (ITS). Such a system could include centrally controlled traffic signals, electronic toll collection, message signs about traffic conditions, and traffic control centres that, as needed, dispatch emergency vehicles, adjust signal timing and relay important road information to motorists. Under government management, the high-tech promises of this system could be compromised. One only has to think of the Federal Aviation Administration's management of air traffic control to

understand how the US government would raise the cost and slow the implementation of ITS.[33]

The possibility of turning US roads over to private companies will seem less far-fetched as the inefficiencies caused by the public sector increase and become more widely known. The best way to implement this experiment and estimates of its economic effects await further research.[34]

VII. THE BRITISH EXPERIENCE WITH URBAN TRANSPORT PRIVATISATION

Urban transport in the UK suffers from many of the same economic problems. Prices for all modes fall short of efficient prices (Peirson and Vickerman, 1998), urban bus and rail transit require large subsidies, road congestion is severe, and transit and highway infrastructure is in poor condition but funds are not available to finance required investments. Unlike the US, however, the UK has begun to address some of these problems by privatising and deregulating part of its urban transport system.

The Transport Acts of 1980 and 1985 largely privatised and deregulated the bus industry in the UK, with the exception of London and Northern Ireland. Although buses operating within London were not deregulated, individual routes were put out for competitive tender. Under the 1985 Act, public or private bus companies could offer virtually any bus service they deemed profitable by giving local authorities 42 days' (6 weeks') notice. The 70 subsidiaries of the National Bus Company — a nationalised entity — were sold and the other publicly managed bus companies that had dominated local bus service were reorganised as separate for-profit corporations. Many of these companies were subsequently sold to the private sector, while those that remained public could no longer receive direct government subsidies. Local authorities could supplement commercial routes by subsidising additional services that they felt were justified by social concerns, but these services had to be secured through competitive bidding.

The privatised UK bus industry has consolidated to a great extent and is currently dominated by large bus companies such as Stagecoach. None the less, the economic effects of the Transport Acts have been broadly consistent with the predictions of bus privatisation and deregulation in the US (Winston and Shirley, 1998). White (1997) found that improvements in labour productivity, lower wages and lower fuel and maintenance costs for minibuses — a major service

[33]Air traffic control has been criticised for decades for cost overruns and delays in introducing new technology that would make air travel safer and faster. Most recently, it has been under the gun for failing to introduce Global Positioning System (GPS) technology that could enable air carriers to choose speedier flight paths and to take off and land more quickly.

[34]Privatisation of roads could (and probably should) be introduced sequentially, beginning with bridges and bottleneck thoroughfares, and moving to entire highways.

innovation — reduced real bus operating costs. Kennedy (1995) found that competitive tendering for bus routes in London also lowered operating costs. As costs have fallen and fares have risen, the government has reduced bus subsidies from £237 million in 1985 to £117 million in 1998. Bus ridership has declined roughly a quarter, but in some areas of the country ridership has increased in response to intensive minibus operations.[35] Just three years after privatisation, minibuses providing local service outside of London have grown from a few hundred to nearly 7,000 (Gomez-Ibanez and Meyer, 1993). Minibuses operate at higher average speeds and offer greater frequencies than conventional buses, and their smaller sizes and manœuvrability allow some operators to offer 'hail-and-ride' service in which the minibus will stop at any point on the route to pick up and discharge passengers. White, Turner and Mbara (1992) estimate that travellers have benefited substantially from minibus services that have expanded into suburban areas.

The UK has not privatised inner-city rail operations, but in March 1998, Deputy Prime Minister John Prescott announced that the London Transport Group (now London Underground Limited) will award three private-sector contracts to maintain and modernise the London Underground. Successful bidders will be responsible for track, signals and stations, while trains will continue to operate within the public sector. The reform is expected to reduce rail infrastructure costs and the Underground's annual subsidy (now some £100 million). The economic effects of this policy will also depend on the rental charges that the public authority must pay the private companies to use the renewed facilities.

The UK has taken no steps to privatise roads, but in 1998 the government published *Breaking the Logjam*,[36] which proposed legislation to empower local authorities to 'charge drivers for using particular roads or roads in a specified area, and to levy a charge on workplace parking'. Although the object is to reduce congestion or traffic growth, Newbery and Santos (1999) point out that there has been little discussion of the principles that should guide these road charges. It appears that local authorities are primarily being encouraged to use them to help finance transport or land-use projects — a purpose that caused the California state legislature to cancel one of the few congestion pricing demonstration projects ever proposed in the US.[37]

Budgetary pressures, rather than concern with allocative and technical inefficiencies created by the public sector, are motivating the UK's privatisation

[35]Bus ridership had been declining before privatisation. In light of this trend, one must be careful about attributing all of the recent decline in ridership to privatisation.

[36]Department of the Environment, Transport and the Regions, 1998.

[37]The newly elected Mayor of London, Ken Livingstone, has recently decided to charge motorists who wish to enter London's Inner Ring on weekdays between the hours of 7a.m. and 7p.m. A fee of £5 for cars is being seriously considered; fees would be higher for commercial vehicles. If this fee is charged, it is expected that traffic would fall 10 per cent and that the average speed would rise from 9 to 11 miles per hour.

efforts in urban bus operations and rail infrastructure. From a US perspective, the UK experience is encouraging because it demonstrates that transit privatisation and deregulation can reduce costs and spur innovative services such as minibuses.[38] On the other hand, the US is not especially concerned with transit deficits, as indicated by the T21 legislation, which increases federal spending for transit (and highways). Thus it is not clear what will induce the US to pursue privatisation.

VIII. FINAL COMMENTS

Intercity deregulation in the US became politically attractive in the 1970s when the political benefits to policymakers from working in harness with carriers and labour were overwhelmed by the potential political gains from reducing inflation. When policymakers were ready to act, academic research was available to guide their understanding of the likely effects of deregulation.

Similarly, the probability of privatising urban transport in the US will increase if the prospect of major political gain becomes clear. Unfortunately, it won't in the near future because recent successes in eliminating budget deficits at all governmental levels have eased pressure to cut wasteful spending on urban transportation. None the less, researchers should continue to explore the effects of privatisation and provide guidance for how cities can conduct privatisation experiments. There is no escaping the evidence that the US government's activity in this area is marked by failure. Research should be available when the promise of political gains beckons policymakers to acknowledge this failure.

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[38]Gomez-Ibanez and Meyer (1993) support this conclusion based on the privatisation experience in several countries including the UK.

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