

transit passes and other incentives from taxable income. Further, I would suggest that Federal transit dollars be spent on new rail systems only if they are matched to some degree by private participants.

I believe that state and local governments are also in a strong position to encourage innovative solutions to transportation problems. One possibility might be to take steps to permit and encourage private sponsorship of new transportation services. Or businesses might be encouraged to support their local transportation by subsidizing passes for employees. ARCO does and it works well.

Next, I would venture to suggest that, at the municipal level, transit agencies might be a little more flexible about competition from private entrepreneurs, such as commuter operators, or be willing to contract with private companies who can offer bargain transportation.

As for our side of the public/private partnership, I think that every business leader should examine possibilities for active involvement in the transportation issue. ARCO looked and then leaped, and I think we can say we have helped.

Before I close, just a brief comment on the Olympics. We know we are going to have a problem. Events will be scattered all over the Los Angeles basin, though congestion will doubtless be greatest downtown as spectators move between the Coliseum and the Sports Arena in Exposition Park, the Swim Stadium on the University of Southern California campus, the Dodger Stadium to the north, with several major hotels and the Convention Center (which is media headquarters for 8,000 accredited new media) in between. At the same time, of course, the banks, office buildings, and stores will be open for business as usual. How bad will it be? Some expect that conditions during those 16 days may be a snapshot of the year 2000 -- with over five million additional trips prior to, and during the Games.

As for myself, I think the Games will be a great success and that we are going to handle the transportation in our stride. My confidence is based on a program that has been developed jointly between the public and private sectors -- perhaps the earliest and best example of the kind of collaborative action this conference is trying to encourage. For example, we have developed and distributed commuter handbooks to help employers with information about expected congestion spots and available options. And the transit district is adding 500 new buses that will carry nearly half the spectators who will be going to the Games. There are no taxpayer dollars involved. We have asked employers to examine a variety of options: review vacation and leave policies; institute carpooling and vanpooling, examine work schedules for flex-time and staggered shifts; consider offering their own park-and-ride lots. Businesses are responding to these suggestions with enthusiasm, and working hard to identify transportation initiatives they can take during the Games. The benefits to the city will last long after the Olympic event has been run.

I think the same will be true of this conference and the ideas generated here, ideas that will endure and bear fruit long after we return to our respective cities. I congratulate those who have put the meeting together as well as all of you who have taken the trouble to come here to share experience and hopes and expectations. Your time will be well spent if the conference sponsors follow up on the ideas generated during the last day and a half.

Thanks again for inviting me. I am delighted to have been part of a wonderful partnership experience.

PRIVATIZING TRANSPORTATION INFRASTRUCTURE
Robert W. Poole, Jr., The Reason
Foundation

The problems of America's transportation infrastructure have been very much in the news this past year. Consider the following news items:

- * A bridge on I-95 in Connecticut collapsed into the Mianus River and three people lost their lives. Subsequent investigations raised serious questions about the adequacy of bridge inspections.
- * During 1983 the New York subway system suffered 20 derailments. An outside investigation traced the cause to the complete absence of inspections that were supposedly being made.
- * A joint Economic Committee study estimated that between now and the year 2000 infrastructure spending needs will total 55 percent more than the funds that seem available, based on present programs. The single most important need -- \$720 billion -- is for roads and bridges, which is \$265 more than is likely to be available.
- * According to a California legislative research body, deferred maintenance of that state's public infrastructure totals over \$20 billion. County roads in California are being resurfaced on a 175-year cycle, rather than every 15 years.
- * Some \$5.4 billion in Interstate highway funds was held in limbo for five months by House Speaker Tip O'Neill, in order to obtain two major projects for Boston.

It is my thesis that there is a common thread linking all of these infrastructure problems. That common aspect is the substitution of political management for economic (businesslike) management. If this thesis is correct, it suggests that privatization of transportation infrastructure may offer significant benefits, not simply in lower costs but in providing incentives for much sounder management practices.

Whence the Problem?

Before examining privatization in detail, it is important to understand why so much of our transportation infrastructure is in bad repair. The short answer is deferred maintenance -- i.e., adequate funds have not been spent on routine, preventive maintenance over the years. But the interesting question is why this is the case. It certainly cannot be because government has difficulty raising money. Over the thirty years, from 1950 to 1980, total government spending in this country increased from being 24.4 percent of gross national product to 36.5 percent. Nor is it due to lack of competence on the part of state and municipal highway and transit agencies; they are generally run by competent, well-educated people.

The basic reason for the deferred-maintenance problem lies in the political process itself. For the most part, the budget of a highway department or a transit agency is determined by the interest group battles that dominate the legislative process. In general, the political appeal of all sorts of interest-group programs -- ranging from day-care to low-

cost housing to space exploration -- is far greater than that of adequate bridge and highway maintenance. And since tax funds ultimately are limited, it is the politically unattractive programs that repeatedly get short-changed.

A second problem is inherent in government management of transportation facilities. As government entities, they are subject to numerous rules and regulations which serve to increase costs substantially above private sector levels. Among these are the government procurement process itself and its various regulations, the Davis-Bacon Act on federally aided projects, civil service personnel regulations and work rules, and public sector fringe benefits and retirement costs. These many rules and regulations serve to increase both the capital costs and the operating costs of transportation projects. Hence, a given budget allocation, hard-won as it may be, will not go as far as it otherwise might if it must be spent inefficiently, in accordance with this plethora of bureaucratic regulations.

Privatization: The Theory

Contrast the above picture with bridges and highways owned and operated as businesses. Such a facility's construction costs would be raised by selling bonds, to be paid off from toll revenues. The level of tolls would be set by the company's management, so as to make the necessary payments to bondholders and to cover all necessary operation and maintenance expenses, as these change over time. In order to maintain the long-term viability of their facility, the owners will presumably make provision in their revenue requirements for eventual rebuilding or rehabilitation as well as routine preventive maintenance.

Such enterprises offer two major attractions to investors: a large, steady pretax cash flow and large depreciation write-offs (even under straight-line depreciation). To the transportation customer, private ownership offers the prospect of refurbishing our decaying roads and bridges more rapidly and at lower cost than would otherwise be possible. It would be more rapid thanks to bypassing the political appropriations process and the government procurement process. And it would cost less thanks both to a shorter construction cycle and to getting around the numerous government rules and regulations cited earlier.

Moreover, toll-based financing would promote more efficient road use. Numerous studies, most recently the Department of Transportation's Federal Highway Cost Allocation Study, demonstrate that heavy trucks impose far more wear and tear on roads than their share of gasoline tax and excise tax contributions. Transportation economists have long urged the implementation of so-called weight-distance taxes to make such trucks pay their own way. Yet it turns out that the tolls imposed by such roads as the Pennsylvania and Ohio Turnpikes are almost perfect analogs of weight-distance taxes. Conversion of most major highways to toll roads using similarly structured tolls would therefore make for more efficient highway usage.

Similarly, in urban areas, if expressways were converted to a toll basis, preferably with automated vehicle identification (AVI) systems, the price charged could be varied with the time of day and level of demand. Numerous studies by the Urban Institute and other analysts have demonstrated that expressway congestion could be significantly reduced by demand-sensitive pricing. This would be yet another benefit of user-paid, privately owned bridges and highways.

Privatization: The Evidence

While the theoretical case may sound plausible, is there any evidence to back it up? Are there any large-scale private bridges and highways? Are they properly maintained? Are AVI systems feasible? Fortunately, the answer to all three questions is yes.

The best known private bridge example comes from Detroit. Linking that city with Windsor, Ontario across the Detroit River are not one but two investor-owned structures. One is the Ambassador Bridge, a 7,500-foot steel suspension bridge built in 1929. Competing with it is the Detroit-Windsor Tunnel, which charges the identical tolls of \$1 per car and 0.125 per 100 pound of truck. Other large private bridges include the Samuel Schuckman Bridge and Causeway -- a two-mile concrete span connecting Boca Grande, Florida to the mainland and owned by the Florida Bridge Company of Venice, Florida; and the quarter-mile long Progreso Bridge, crossing the Rio Grande to connect Progreso, Texas with Nuevo Progreso, Mexico and owned by the B&P Bridge Company.

The Ambassador Bridge was conceived by Detroit financier Joseph A. Bower. His Detroit International Bridge Company demonstrated the virtues of private enterprise from the very start, by offering its construction contractor a bonus of half a day's tolls for each day he finished ahead of schedule. The bridge was completed eight months early and one percent under budget. Today the bridge carries six million vehicles a year, generating a pretax cash flow of about \$6 million a year and depreciation estimated at \$1 million a year. It is owned by the Central Cartage Company of Sterling Heights, Michigan, which beat out three other bidders in 1979, paying about \$30 million for the bridge.

Another large suspension bridge is the Lion's Gate Bridge linking Vancouver and West Vancouver, British Columbia. It was built as a private venture in 1938 and operated profitably by the First Narrows Bridge Company until 1955. At that point, the provincial government turned down the company's request for permission to build a second, parallel span. Instead, it nationalized the bridge, promising to build a second span in due course. Ironically, nearly 30 years later the second span remains un-built.

At last count the United States had only 334 toll bridges, most of them government-operated. But what is readily observable about these bridges is that they are invariably well maintained. In New York City it is not the George Washington or the Triborough Bridges which are in bad repair. Those bridges, funded by tolls and operated by corporate-like independent authorities, are substantially insulated from the political interest-group competition for tax revenues. They can set their own budgets, taking the long-term properly into account. It is the city-owned bridges -- like the Brooklyn, Manhattan, and Queensboro -- that are the victims of deferred maintenance.

The same is true of toll roads. A 1978 study by the National Transportation Policy Study Commission concluded that "by and large toll roads are better maintained than other roads." Furthermore, a 1980 Federal Highway Administration (FHWA) study found that most United States toll roads have achieved self-sufficiency, thereby insulating themselves from the political revenue-allocation process. Extensive studies of the benefits of toll roads are now underway in a number of states, including Arizona, Maine, Pennsylvania, South Carolina, and Wisconsin. Voters in Houston recently

gave overwhelming approval to a bond issue to construct several toll-funded expressways.

Toll funding -- and even private ownership -- is much more common in Europe than it is in this country. A multinational study conducted for the International Bridge, Tunnel, and Turnpike Association in 1977 found that five European countries -- Belgium, France, Italy, Spain, and the U.K. -- had a total of 8,868 miles of toll roads, compared with only 4,416 miles in the United States. In France, Italy, and Spain, 5,296 miles of toll highway have been built by concessionaire firms -- companies under long-term contract to build and operate the roads as business enterprises, such as Italy's Autostrade. Most of the national network of major roads in Western Europe are toll roads, built to standards at least the equal of the U.S. Interstate system. And most of the major bridges and tunnels in England, Portugal, and other European countries have been built by toll financing. France's L'Autroroute de L'Est, currently under construction, is a private operated toll road.

Toll financing is also expanding in the Third World. Indonesia is linking its islands of Java, Bali, and Sumatra with a network of toll roads and bridges. Korea has developed a toll road system to bring farm products to the cities. Yugoslavia has several toll roads and a six mile toll tunnel. And in 1982 a Hong Kong entrepreneur announced plans for a \$500 million, 145 mile toll highway to link Hong Kong and Macao via Canton. Developer Gordon Wu plans to build and operate the superhighway as a business venture, with ownership reverting to the Chinese government after 30 years (similar to the concessionaire arrangements in France and Italy).

Increasingly, transport economists like Michael Beesley of the London School of Economics and Gabriel Roth of the World Bank are enumerating the benefits of private road ownership. In a paper presented at the International Road Federation's 1981 meeting in Stockholm, Beesley pointed out that Road Owners (which he called R.O.s) obtaining their revenues from tolls, would have much stronger incentives for proper pricing, planning, and maintenance than tax-funded road departments. Roth has contributed to several studies of private roads published by London's Adam Smith Institute. He estimates that lack of adequate road-building and maintenance is costing British shippers some \$2.2 billion a year. Yet the political process cannot seem to generate adequate funds even for preventive maintenance. Hence, there is increasing British interest in proposals for private financing and operation of roads.

For example, Gabriel Roth and Jon Semmens have reported on a 1983 proposal for quasi-privatization for a new highway in England's West Midlands. A consortium, consisting of Tarmac Construction Company, National Westminster Bank, and Saturn Management, Ltd. has offered to design and build the new seven-mile "Black Country Route," raising their own capital to do the job. They propose being repaid over a 25-year period in accordance with a formula based on the actual level of traffic using the road. The road would be built to County Council specifications and the County would own and operate it, without tolls. The funds for repayment would come from the County's normal tax-based roadway funds.

Were even this scheme for quasi-privatization put into widespread use, the benefits would be substantial. The risks of roadbuilding would be shifted from the public sector to the private sector. (If the construction consortium guessed wrong about future demand, its investors would bear the loss from lower-than-estimated payments. If it

guessed very well, the investors would benefit from higher payments.) Construction schedules would be reduced (in the West Midlands case from ten years to an estimated five years) and total cost would be reduced due both to shorter construction time and more efficient private management. Moreover, as a system for road building, it would depoliticize decisions about which roads to build where and when, substituting economic criteria (maximizing expected future revenues) for political ones.

Automatic Vehicle Identification - How Feasible?

Instituting tolls on urban roads and bridges could increase already severe traffic congestion if conventional cash-only toll booths were employed. Hence, there is growing interest in various systems for automating toll collection. Optical scanning systems were tried by the railroads but found to be too vulnerable to dirt and weather conditions. Most interest today centers on microwave radio systems for Automatic Vehicle Identification (AVI). The basic concept involves a transponder with a unique identity code on board each car. Roadside detectors would record the passage of each vehicle past specific toll-charging points (identified by electronic signs announcing the fee for that time of day -- e.g., \$5.00 at rush hour, 50¢ at 3 A.M.). A real-time computer system would record the information from all the receiving points, collate it by identification number, and compute monthly bills, similar to long distance telephone bills. For heavy trucks, automatic weighing systems using load cells already exist, capable of weighing trucks moving up to 40 m.p.h.

Preliminary tests of microwave-based AVI systems have been carried out by both the Golden Gate Bridge, Highway, and Transportation District and the Port Authority of New York and New Jersey. Low-cost on-board transponders have been developed by such firms as Siemens and Philips in Europe, by Toshiba in Japan, and by Identronix in this country. The latter firm's custom identification memory chip is being installed on the chassis of all automobiles being produced at three-robot-equipped General Motors plants. By reading a particular chassis' identification number, the robot is told which operations to perform to make the car into, say, an Impala sedan rather than a Caprice station wagon. If every new car were manufactured with its Vehicle Identification Number encoded in such a memory chip, then nationwide AVI could be phased in within a decade. (In volume production, the chips would cost only a few dollars each.)

The first citywide AVI/road pricing system is under development today in Hong Kong. Called Electronic Road Pricing, it is expected to be operational by 1987 at a cost of \$50 million. All public and private vehicles in the colony will be equipped with tamper-proof electronic number plates. Up to 300 sensing loops will be installed at various roadway locations, marked by electronic price signs. In order to make the maximum impact on traffic congestion, substantially higher prices will be charged during rush hours.

Within weeks of the Hong Kong project's announcement, loud protests from private vehicle owners began to be heard. In part, the complaints were the predictable resistance to paying more for something one already uses. But also strongly voiced were fears of government invasion of privacy, due to the record of vehicle movements which will be collected by the system. One counter to such fears of 1984 is private ownership of the AVI-equipped roads.

Few Americans complained of 1984-type surveillance because their (privately owned) telephone company compiles a monthly record of all their toll calls. Were these records being collected by the government, however, the concern would be significant. Yet the benefits of AVI -- eased congestion, revenue generation, and more rational road usage -- are so large that the privacy objection should be overcome. One way to do so is by privatization.

Private Rail Systems

The idea that rail transit systems could be owned and operated as private, profit-making businesses may sound like an anachronism to most Americans. Yet just such systems exist in Japan. Eight of Japan's fifteen major private rail lines serve metropolitan areas -- and all are profitable. They are regulated as public utilities and allowed an eight percent rate of return. Fares are set to cover both operating and capital costs.

In the environment created by this sort of realistic pricing, even government-owned transit comes close to full-cost recovery from the farebox. Tokoyo's city-owned Toei Subway Line recovers 75 percent of its total costs (operating cost plus depreciation and interest charges) from fares. And the Japan National Railways commuter lines in the Tokoyo area operated at a profit in the latest fiscal year. Incidentally, the transit modal split in Tokoyo is 30 percent private rail, 30 percent Japan National Railways, 18 percent city subway, 15 percent bus, and 7 percent taxi.

To be sure, Japanese cities have higher population densities than American cities. But some U.S. cities are dense enough to make private enterprise (i.e., fully user-supported) subways feasible. A 1982 study by Charles River Associates showed that the New York subway system could cover all of its operating costs from fares if all operating subsidies were eliminated. The fare elasticity is so low that ridership loss would be only about 7.5 percent at a cost-recovery fare level of \$1.41. Interestingly, the Charles River Associates study took the present costs of the New York subway system as a given. By contrast, New York University economist James Ramsey took a close look at the numerous inefficiencies plaguing the New York system -- greatly excessive staffing, a number of very low traffic segments, lack of automation, etc. Projecting how unconstrained private operators might manage the New York subway lines, Ramsey made a persuasive case that privatization -- selling off the lines to several independent firms, to be operated without economic regulation -- would lead to markedly lower costs.

The promise of lower costs has led several other groups to look seriously at privately designed, constructed, and operated rail transit systems. Orange County, Florida has asked private firms for proposals to build and operate a rail system linking the airport to downtown Orlando and the Walt Disney World resort area. Fort Lauderdale, Florida is considering private financing for its downtown people-mover project, as is Portland, Oregon for its second light rail line. And in the intercity rail market, American High Speed Rail Corporation is pursuing an ambitious plan to raise \$3.1 billion to adapt the Japanese bullet train technology to a Los Angeles-San Diego operation. The Bank of Tokoyo and the First Boston Corporation are key members of the financial team, and part of the money will come from tax-exempt revenue bonds authorized by the California legislature.

These examples do not show that every proposed urban rail system could be financed privately -- and that is precisely the point. Having to convince investors that a system makes sense -- that there is a market demand for it and that it is being done as cost-effectively as possible -- serves to weed out economically unsound projects. Investors who have their own funds at risk cannot accept ridiculous featherbedding, unnecessary (but politically motivated) station locations, unproved technology, etc. The cost of a transit system is not a given. It is very much a function of entrepreneurial skill, shaped by market demands. Government ownership and heavy taxpayer subsidies short-circuit the vital screening process that distinguishes sound projects from boondoggles.

Outlook

Despite the potential for privatization for rebuilding this country's transportation infrastructure, several barriers remain in the way. To begin with, there is bureaucratic inertia and the not-invented-here syndrome. Second, in the case of all roads and bridges built with Federal aid, there is a legal barrier as well. Section 129, Title 23 of the U.S. Code specifies that if a state imposes a toll on such a facility, it must repay to the Federal government all the Federal money used to build it. Federal Highway Administration official Richard B. Robertson has joined a number of state highway officials in urging that this provision be repealed. Finally, there is also public opposition to the imposition of tolls on formerly "free" roads and bridges and of market pricing for rail transit. This is an obstacle that can be overcome through enlightened leadership by public officials and opinionmakers.

The advantages of privatization are many. It offers a way of raising the vast sums needed to rebuild our decaying infrastructures. More important, it solves the problem that led to the decay, by changing the institutional incentives to promote more responsible outcomes, insulating these essential facilities from the ebb and flow of political pressures and interest groups. And by making users pay directly, in proportion to the load they place on the system, privatization will ensure the most efficient use of our transportation resources.

COMMENTS ON PRESENTATION OF ROBERT W. POOLE, JR.

Franklin D. Raines, Lazard Freres
and Company

Mr. Poole strenuously argues that disinvestment in our national infrastructure is a problem which privatization can cure. He says that reinvestment loses out to operating programs in the competition by removing major capital-hungry infrastructure activities from the government altogether and turn them over to private owners and/or operators. There also runs through his paper an underlying theme that there is a shortage of capital and that privatization will solve this "revenue problem."

Although the benefits cited from privatization are inviting, they have costs which must also be considered. Further, most of these benefits can be obtained with a well run public enterprise. Many of the unfeathering distinctions between privately operated businesses and government operations do

not equally apply to publicly operated enterprises. Is there any evidence that investor-owned utilities are more efficient than those publicly-owned? Finally, there is no shortage of capital for public infrastructure purposes -- there is only the problem of the willingness to pay its cost.

The major benefits of privatization result from the deregulation of costs and prices. On the cost side it permits service standards, service levels, and wages to be removed from direct government determination. On the price side efficiency is encouraged by eliminating cross subsidies and by shedding unprofitable businesses through pricing decisions.

The major problems with cost and price deregulation for public facilities is that the effect is inevitably to provide less service at a higher cost for many users. Indeed, we would expect that for many of these facilities there would be insufficient demand of a market price to provide anything like the level of service that is currently provided. That is why many of these facilities are publicly operated in the first place. If a subsidy is to be provided to pay for the additional service or reduced price, it is unlikely that significant re-regulation could be avoided. It seems less than compelling to suggest that the public endure the trauma of deregulation through privatization, as is currently being experienced in the airline, trucking, and telephone industries, merely to have a private rather than public provider of the same service. It is true that the current tax code favors capital investment by private business more heavily than that by governments. The net effect of accelerated depreciation and tax credits may well reduce private costs of capital below the tax-exempt interest rates available to local governments. But reducing the cost of capital does not necessarily lead to increased investment. Corporate disinvestment in cases where consumers lack the willingness to pay the cost is just as prevalent as public disinvestment.

A well-run publicly owned enterprise can adopt the kinds of efficient means of operation usually associated with private enterprises, except perhaps the sweat equity by an entrepreneur. The technique of attacking unit labor costs through cutting the costs of new employees and expanding operations was pioneered in mass transit in Seattle many years before it was adopted by American Airlines. Subsidies can be made explicit and managerial incentives can be created so as to provide the same incentives for efficiency. Since government regulation is likely to remain for any privatized public facility it is debatable whether the adversary relationship typical of public service commission type proceedings is a more efficient process than the deliberations of a dedicated public enterprise board of commissioners.

In sum, the true measure of whether there is inadequate investment in public infrastructure is whether the public is receiving less than it is prepared to pay for. Privatization does not by itself increase the amount of capital available or invested. Should the public be prepared to support additional capital investment it may well be more efficient to use public enterprises rather than private ones to provide the facilities desired.

CITY PRESENTATIONS: HARTFORD, CHARLOTTE, HOUSTON

HARTFORD

Paul A. Ehrhardt, CIGNA Corporation

Thank you for this opportunity to talk about Hartford and the innovative work that is underway to solve its central business district transportation problems. What we have accomplished in a relatively short time is, I believe, quite significant.

We have learned some lessons along the way, and hope that they might be useful to you who have come from many different cities around the country. What we want to talk to you about can be organized under three themes: philosophy, process, and product.

The philosophy involves management. In this age of fiscal constraints, none of us can afford to focus only on increasing the supply of transportation facilities and structures to try to keep up with increasing usage. We must also learn to manage the existing facilities and structures better, and more importantly, we must learn to manage demand itself.

The process involves collaboration and consensus-building. First, agreement is needed on the nature and scope of the problems; second, all key parties must reach consensus on the importance of dealing with those problems, and third, solutions should be developed by all stakeholders, public and private; i.e., by everyone who has an interest in the outcome. This includes both the people responsible for deciding what is to be done and the people responsible for carrying out what is decided.

The product involves creation of a transportation management organization (TMO), an ongoing mechanism that institutionalizes the collective efforts to manage demand. What makes the TMO unique is the fact that it is a private sector structure that operates in a public sphere and it focuses primarily on the transportation actions of major employers.

To understand how each of these points applies to the Downtown Hartford Transportation Project, I will give you some background on the project, its recommendations and their implementation.

Over the past few years, Hartford has experienced an unprecedented boom in office construction, with more than three million square feet now completed, under construction, or committed. This represents as much office space as was completed in the previous twenty years combined.

With this growth has come great concerns. How will the city handle the thousands of new employees joining the downtown workforce? Will the city begin, literally, to choke on its own success? In the area of transportation, the concern was especially acute, for a variety of reasons.

First, Hartford's central business district is very small, only 50 square blocks and already dense, with 42,000 workers now employed there. Short-term parking is scarce and traffic congestion, while moderate in comparison to other cities, is intense during the morning and afternoon peak periods.

Second, the Interstate highway system was not built as originally designed. Hartford sits at the intersection of I-91 and I-84, but the two highways are not fully connected. You must leave one highway and travel city streets to get to the other. In addition, an Interstate beltway, which was designed to divert traffic from the downtown highways, was never built. The result is a dangerous, confusing, and congested highway system. I should add that