Policy Study No. 274

Putting Customers in the Driver's Seat: The Case for Tolls

BY PETER SAMUEL

Executive Summary

Highway tolls should not be viewed as a last-resort or temporary financing mechanism. Rather, this study argues that, for a number of reasons, tolls should become the payment mode of choice for 21st-century highways, gradually replacing fuel taxes.

Because operating costs are comparable with capital costs over a highway's life, it is wrong to maintain that tolls should come off as soon as the initial capital costs have been recovered. And even on well-designed roads, pavement completely wears out after 30 or 40 years (the age of many U.S. freeways and Interstates) and must be replaced-—often at much higher cost than it took to build the road originally.

Thanks to a doubling of average fuel economy since the 1950s (from14 miles/gallon to 28 mpg), today's fuel taxes bring in far less revenue *per mile driven* than those of 40 or 50 years ago. According to the Federal Highway Administration, simply preventing the present highway stock from deteriorating would require an additional $8 billion per year in capital spending. And to keep pace with projected growth in population and travel, highway investment would have to increase by another $32 billion per year. To generate that level of investment would require massive gas-tax increases.

The alternative to major gas-tax increases is to selectively increase the use of tolling, for specific projects that will produce direct benefits to users. Already about 10 percent of major U.S. highways are operated as toll roads, and a number of fast-growing urban areas—including Dallas, Denver, Houston, Miami, Orlando, Orange County (Calif.)—have turned to toll roads to keep pace with their growth.

Tolls offer a number of advantages over gas taxes, including:

- **Fairness:** only users of a toll road pay for it, and directly in proportion to their use;
- **Large Scale:** a toll revenue stream permits large sums to be raised in the capital markets, making it possible to build large-scale projects in a short period of time;
- **Less Pork:** having to prove to the bond market that a toll road is viable tends to weed out pork-barrel projects;
- **Greater Safety:** the accident rate on toll roads is one-third less than on comparable free roads;
- **Better Maintenance:** bondholders insist on legally enforceable requirements for proper ongoing maintenance, for which there is no counterpart on free roads;
- **Traffic Management:** time-variable tolls (high at rush hour, low at off-hours) smooth out traffic flows, greatly reducing rush-hour congestion.

Much of the traditional opposition to tolling can be addressed with new methods and technology. Toll plaza congestion can be reduced (and later eliminated) via nonstop electronic toll collection. Fully automated toll roads, designed completely without toll booths, are in operation today in Toronto, Canada and Melbourne, Australia, and others are on the way. We need never build another toll booth or toll plaza, ever again. And we can begin now to phase out all existing toll booths and plazas.

"Double taxation" can be eliminated by giving rebates to toll road users for the amount of gas taxes they have paid for all miles driven on toll roads. Such programs already exist on toll roads in New York and Massachusetts. Electronic toll collection makes it easy to calculate and pay the rebate amounts. Eliminating this form of double payment should reduce opposition to expanded use of tolling, since drivers would then be paying either a toll or a gas tax—but never both.

States could encourage a shift toward greater use of tolling by enacting gas-tax rebate programs and also by enacting modern public-private partnership laws, under which private consortia can finance, build, and operate tolled bridges, tunnels, and highways. And Congress could encourage this trend by rewarding states for phasing out toll booths in favor of all-electronic tolling and by creating a level playing field in highway finance for toll road bonds. A positive tolling agenda of this sort ought to win support from highway users, taxpayer groups, and those environmental groups that strongly support the user-pays principle.

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Part 1

Introduction: Can Tolls Be More than a Necessary Evil?

The staff of the International Bridge Tunnel and Turnpike Association (IBTTA) live daily with an awkward 21-syllable name. In 1997 executive director Neil Schuster proposed renaming it the World Toll Association (WTA), but the idea was dropped because several leading members objected. They said the word "toll" has negative connotations with the public, so "toll" should be kept out of the name.[1] Many toll road operators resort to euphemisms. They call their roads expressways, parkways, or greenways. One has even been called a freeway! And the Pennsylvania Turnpike and some others say they collect not tolls, but "fares" from motorists at the toll booths. The old term Turnpike Authority is giving way to the bland Transportation Authority, as in the case of Oklahoma. Massachusetts Turnpike now operates a "Metropolitan Highway System."

In large part the toll industry's reticence reflects a lack of intellectual and moral self-confidence, a feeling that what they are doing—collecting tolls to pay for roads—is at best a necessary evil, and should be discontinued as soon as possible. Virginia Department of Transportation's director of finance, James Atwell once expressed this view explicitly in a discussion of that state's toll facilities in an interview with the author. Many even in the toll business concur with Atwell. In this view tolls are a last-resort financing mechanism. Tolls are only to be employed when it is impossible to find tax revenues to finance roads, and it is good public policy to retire debt and end tolls as soon as possible.

This policy study presents a different view. It argues that tolls should become the payment mode of preference for 21st-century highways. It argues that as tolling technology has become increasingly automated, and that as fuel types proliferate with hybrid engines and fuel cells, direct toll charges should become the norm for financing major roads rather than fuel taxes. On this view, taxes should only be levied for supporting highways when toll financing cannot be made to work. Moreover, not only should tolls be the first means of financing highways, they should be permanent tools of finance and traffic management.

In essence, this is an argument for "normalizing" highway finance—bringing it into the political and economic mainstream. Most goods and services are charged for directly—even network infrastructure services like electricity, telecommunications, and water supply. Tolls enable highways to be charged for as they are used, with direct payment from the user to the specific service provider. In the case of highways (i.e., major roadways, not local streets), access is being provided to motorists to a controlled stretch of pavement

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[1] "Words: Toll, Fare, or Road Payment," *Toll Roads Newsletter*, no. 21 (November 1997), p. 16.

designed for them to get from place A to place B. That highway represents capital investment in right of way, pavement, bridges, lighting, fencing, signage and the like—scarce resources which could have been deployed for other productive purposes. It also involves ongoing costs to patch and repair the highway against the damages of weather and heavy loads, to keep it clear of snow and ice in the winter and of debris dropped off trucks or blown by storms, to trim and clear the edges of excessive vegetation, lighting expenses, keeping drains in operation, and policing to discourage motorists from breaking the rules of the road. In fact, operational costs are comparable with capital costs over the life of a road, making it quite false to argue that there is no need for tolls once a road's initial capital costs have been recovered.

Conventional economics tells us that investments in highways, like other capital investments, should be made—up to the point where users cease to be prepared to pay the costs of the facility. If demand is not being satisfied with the current infrastructure and a facility is making above-average profit, that is—in the normal economy—a market signal and an incentive to expand capacity, even though that extra capacity may cost more than the old.

Part 2

Why We Will Need Tolls for Rebuilding U.S. Highways

America's transportation infrastructure is critically important to our global economic competitiveness, the freedom and mobility of our people, and our general quality of life. Cheap and fast transportation increases the choice of goods available. It also increases competition, lowers consumer prices, and increases the quality of goods and services. Many attribute the economic health of the mid-1960s to the opening of new regional markets and economic efficiencies brought about by the initial development of the Interstate highway system. Yet the continued health of our highway infrastructure cannot be taken for granted. Indeed, there is cause for considerable worry over whether current policies are up to the task of rebuilding and modernizing these vital arteries.

A. The True Cost of Highways

Roads are costly to build. They need right-of-way which could be used for other purposes, so their land involves a substantial cost. And they are expensive to maintain. They need regular maintenance by way of sealing joints, patching broken pavement, painting rustable materials like steel, and clearing drains. Mowing and tree trimming of verges and lighting are other regular expenses. Some response system is needed to remove dangerous debris on the pavement that has been dropped by careless motorists or brought down by storms. In winter, ice and snow have to be dealt with. The road rules have to be policed. The very fabric of the pavement and bridges deteriorates from the moment it is built. Good preventive maintenance can slow that deterioration but traffic wheel loads and the elements of sun, rain, seepage, humidity, and various chemical reactions give the pavement and bridge structures—indeed, everything associated with the road, including sign gantries, guard rails, lights and drains—a finite life.

Concrete pavement lasts 30 to 50 years, and around the end of that time it crumbles and loses its load-bearing capacity. Asphalt pavement has a somewhat shorter life; properly built it lasts 30 years. Asphalt deteriorates on the surface and needs overlays or top resurfacing every ten years or so, while concrete pavement needs milling to prevent it being polished slick by traffic and to restore its traction properties or skid resistance. Bridge decks are particularly stressed by freeze-thaw cycles, soaking rain, and bending from moving loads. They need to be renewed every 10 to 15 years, though improved concretes and coated reinforcement steel are extending their life. The main foundations, piers and beams of bridges have much longer lives (50 to 100 years is typical) if properly maintained, but eventually chemical deterioration and metal fatigue weaken them

and make replacement necessary. Therefore conscientious road accountants make a depreciation allowance to spread the capital cost over the useful life of the roadway.

The truth is there are no free roads. A road may be untolled but it is still costing the community money, and if it is not paid for with tolls, it will have to be paid for in taxes. Or else it will steadily deteriorate until, like New York City's famous Westside Highway in the 1970s, sections collapse, and long lengths have to be closed to traffic for safety.

Often politicians arguing for a toll road declare that tolls can be removed "when the road is paid for." By "paid for" they usually mean when the original financing bonds are paid off. For example the first head of the Illinois Tollway, Austin Wyman, is frequently quoted as having said in a speech back in 1956 when work was starting on the original 182 miles of Chicago's tollway system, that the roads would be made "free" when the bonds were paid off in 1984.[2] In addition, as mentioned earlier, from 1956 to 1990, the USDOT pressured toll roads to sign tripartite agreements with itself and the state DOT promising that in return for taking financial support now, they would commit to abolish tolls, when current bonds were repaid.

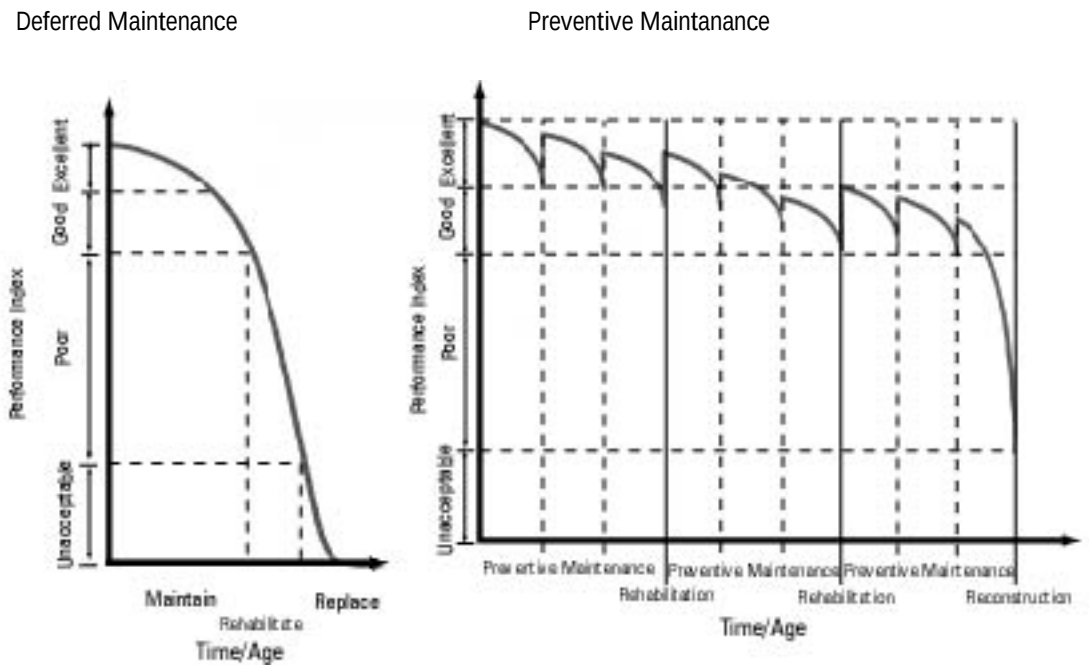
Many attribute the economic health of the mid-1960s to the opening of new regional markets and economic efficiencies brought about by the initial development of the Interstate highway system.

That makes no sense. No one suggests rents should be abolished when the mortgage on an apartment building is paid off. In economists' lingo the opportunity cost, or alternative opportunities for using the capital, should be reflected in pricing. In addition, there are ongoing expenses and, soon, rebuild costs. In the case of the Chicago-area toll roads, in the 1970s major extensions were made with new bonds issued on the security of revenues from the whole system. By the late 1990s the original concrete pavement had softened so much from chemical aging that resurfacing with asphalt overlays lasted only 5 or 6 years compared to 12 years, and more frequent sectional rebuilds to bare earth were needed. Consultants reported that complete rebuild was more economical than continued patch and overlay, which becomes increasingly disruptive to traffic. Complete physical rebuild is an opportunity to improve roadway geometrics, to enhance capacity and safety at relatively little extra cost. But the total cost is likely to be greater than original construction even allowing for inflation. (Reconstruction, unlike original construction, has to be done under traffic.) New bonds for some $4 billion will have to be issued. These are the financial realities.

Figure 1 illustrates trade-offs involved. The left-hand portion of the figure shows the pattern of deterioration in pavement performance in the absence of significant regular expenditures on preventive maintenance; under these circumstances, a highway will typically need complete reconstruction after about 20 years. The right-hand portion shows how regular preventive maintenance, a significant ongoing expense, can lengthen a highway's life up to 60 years. Extensive research has shown that the latter practice actually reduces life-cycle costs significantly. But it does require significant ongoing expenditures over the entire 60-year period, readily justifying the continued existence of tolls throughout the highway's life.

[2] "Illinois Governor Calls Tolls 'Nuisance', Looking at 'Creative Alternatives,'" *Toll Roads Newsletter*, no. 42 (September 1999), p. 1.

Figure 1: Pavement Performance Under Alternative Maintenance Practices



Source: Daniel J. Dornan, "Asset Management and Innovative Finance," presented at Second National Conference on Transportation Finance, Transportation Research Board, Scottsdale, Arizona, August 20-23, 2000.

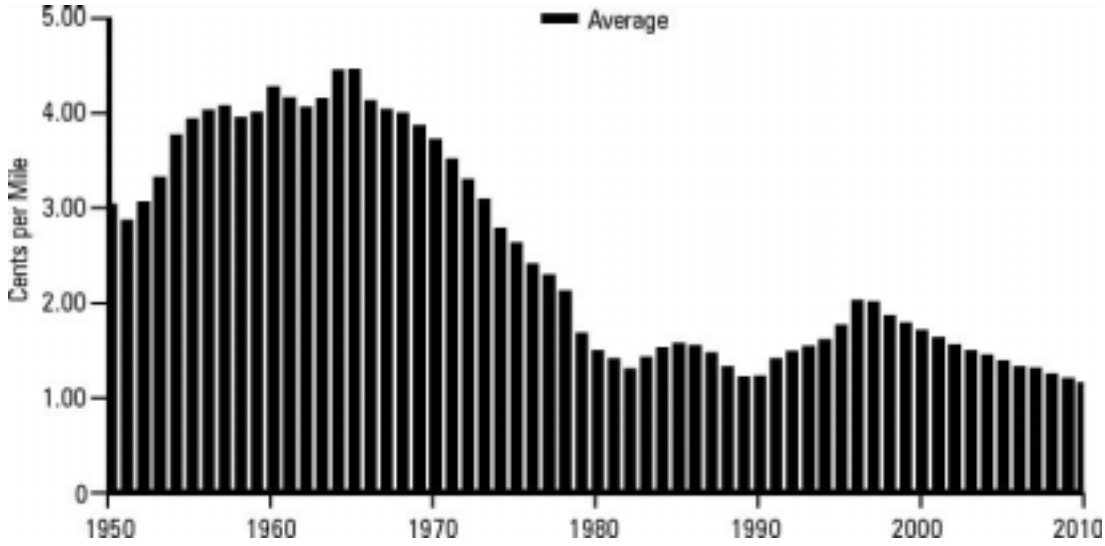
B. The Looming Crisis in Highway Funding

Per-gallon fuel taxes (a tax on gasoline for light vehicles and on diesel for trucks, which in shorthand we call a "gas tax") were instituted in the early 1920s. In most states and at the federal level they were first set up as "user fees" which, rather than going into general government treasury funds, were directed into highway trust funds dedicated to the construction and upkeep of roads. They were conceived as a kind of shadow toll, the theory being that people would pay in proportion to their use of the roadway system. Politically they had the advantage in the early days that they were small and, being levied on a small number of wholesale fuel distributors, rather than on the consumer at the cash register, they were a hidden tax. However the tax has now grown so large (typically it is 35¢ to 45¢/gallon) that it is well known and there is strong resistance to any further rises. Indeed, with rising oil prices in spring/summer 2000, there were serious moves to lower the gas tax.

In California the state gas tax was increased three times between 1948 and 1963, an average of once every five years, but in 37 years since it has only been raised twice—in 1982 when it was raised 2¢, and again in the early 1990s, when another 9¢ was added over several years (after huge political effort). California's experience is pretty typical. Voters, by and large, don't trust governments to spend gas tax money well, and they often punish politicians who raise the gas tax. As one study put it: "Despite public concern over congestion, and to a lesser extent, maintenance, it is becoming increasingly difficult to achieve the political

consensus necessary to raise fuel taxes."[3] The authors calculate that in order to raise the same amount of revenue for each vehicle-mile traveled now as was raised in 1960, the state gas tax would have to be 48¢/gallon now compared to the actual 18¢/gallon. They do not recommend the 30¢/gallon increase, but simply point out that this is a measure of how far backward California has gone in raising money via the state gas tax relative to the traffic that is using the roads: "We are currently paying much less per mile to drive than we did nearly four decades ago, though we rely today much more on the safety and accessibility of roadways than in 1960." (p. 64) Figure 2 depicts the real (inflation-adjusted) value of fuel-tax revenues per vehicle mile traveled in California, and their projected value through 2010.

Figure 2: Historical and Projected California and Federal Fuel Tax Paid ($1997 per vehicle mile traveled)



Source: Jeffrey Brown, Michele DiFrancia, et al., *The Future of California Highway Finance: Detailed Research Findings*, Research Report UCB-ITS-RR-99-3 (Berkeley, CA: Institute of Transportation Studies, University of California at Berkeley, August 1999), Figure 4.3, p. 46.

Fuel tax revenues are under pressure from improvements in fuel efficiency. In the late 1950s the average car got 14 miles per gallon (mpg); in 1978 this had increased to 20 mpg, and by 1999 to 28 mpg.[4] The Partnership for a New Generation of Vehicles (PNGV), a federal/auto industry effort to develop technologies for a radically more efficient and cleaner vehicle, is aiming for 80 mpg fuel economy for a midsize family automobile in 2004.[5] The PNGV, which includes the Big Three Detroit automobile companies, considers this a difficult but not impossible target. But even if they fall short, it is clear that large improvements in fuel economy will continue. This will continue to depress the take of the per-gallon based fuel tax .

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[3] Jeffrey Brown, Michael DiFrancia, et al., *The Future of California Highway Finance* (Berkeley: California Policy Research Center, 1999), p. 2.

[4] Stacy C. Davis, *Transportation Energy Data Book: Edition 19—1999* (Oak Ridge, TN: U.S. Department of Energy, Oak Ridge National Laboratory, Center for Transportation Analysis, September 1999), p. 7-19, Table 7.15.

[5] National Research Council, *Review of the Research Program on the Partnership for a New Generation of Vehicles: Fifth Report* (Washington, D.C., 1999), p. 1.

There is an associated push for "alternative fuels"—mostly compressed natural gas and ethanol, but also electricity. Vehicles powered by these fuels use the roads just as much as gas or diesel vehicles but they are usually taxed at a lower (or zero) rate to encourage their adoption, another leakage in fuel-tax revenue.

The cents per gallon basis of the fuel tax also leads to the value of the revenue stream being diminished by inflation. The costs of road construction have grown faster than inflation generally. Road building today has much higher planning and design costs because of the extensive study of alternatives and the desire to accommodate environmental and local concerns. It is not uncommon for 15 to 20 percent of project cost to be design and supervision costs. Highways are being built to much higher environmental standards than in the past, but gas tax rates have never been raised to pay for this. In addition, road work costs are increased by land acquisition costs, and the increasingly common practice of scheduling construction at night and segmenting the job in order to maintain the same number of lanes open for traffic in peak hours.

At the same time many highway trust funds have been turned into highways-plus trust funds, the "plus" being transit, ferries, bicycle paths, and various programs to attempt to reduce travel. What began as funds to use motorists' user taxes for roads have been spread into funds to support all kinds of transport programs. Transit was generally self-supporting in the first half of last century, but as Americans moved to automobiles, transit was unable to manage a diminishing base of business and governments took it over, and kept it alive only with increasingly heavy subsidies. At the federal level about a fifth of motorist taxes from highway trust funds now go to transit rather than to roads.[6] The proportion in the states varies greatly but is substantial in several states.

The truth is there are no free roads. A road may be untolled but it is still costing the community money, and if it is not paid for with tolls, it will have to be paid for in taxes.

The last several decades have seen American urban areas reshaped by a revolution in automobility. The greatly increased participation of women in the work-force and the complexity of family trip-making have significantly increased the amount of driving. Retailing has moved toward large big-box stores geared to deliveries by tractor-trailer loads with almost 100 percent of customers using their cars to haul away their purchases. Most new workplaces are in road-oriented office and commercial parks in one to five story buildings surrounded by parking lots. The dispersed nature of origins and destinations, the ubiquitous availability of personal vehicles, and people's need to use vehicles for hauling items, has left transit with small and diminishing niche markets in all but a few older high-density metro areas such as New York City.

The steady growth in driving, and new patterns of urban economic activity, require major investments in upgraded roads. Annual congestion costs of wasted travel time and wasted fuel in the largest 68 urban areas is $72 billion/year,[7] suggesting nationwide costs of about $100 billion per year. (Compare this number to the $130 billion spent over 40 years to construct the Interstate system!) There are also substantial additional annual costs in unnecessary accidents, and in distorted investment locations due to the inability of the road system to respond to demands. In its latest biennial report on U.S. highway investment needs, the Federal

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[6] American Petroleum Institute, *Estimates of Annual U.S. Road User Payments versus Annual Road Expenditures*, Research Study no. 078 (Washington, D.C., March 1995).

[7] Texas Transportation Institute, *1999 Annual Mobility Report* (College Station, TX: Texas A&M University, 1999), p. V-13.

Highway Administration (FHWA) estimates that simply to maintain current average pavement conditions, this country should be spending $51 billion per year—compared with actual spending of $43 billion. But to cope with projected increases in travel by adding additional lanes and new routes would increase that annual total to $83 billion.[8] No obvious source of additional highway funding has been identified to address this huge investment need.

State governments have tried to cope with the impasse in various ways. Many have been accepting the federal invitation to engage in "innovative finance"—notably in selling bonds secured to future federal gas tax grants. Such "Grant Anticipation Revenue Vehicle" (known as GARVEE) bonds help alleviate a funds shortage now with a one-time borrowing operation, but at the price of tying up future federal grant funds for debt service and repayments. They just move the funds shortage out a few years and increase the severity of the funds crunch once all the future revenues are borrowed against. North Carolina is in this situation—fully borrowed up with future federal funds heavily committed to servicing debt—and other states will soon face this problem, too.

Voters, by and large, don't trust governments to spend gas tax money well, and they often punish politicians who raise the gas tax. In order to raise the same amount of revenue for each vehicle-mile traveled now as was raised in 1960, the state gas tax would have to be 48¢/gallon now compared to the actual 18¢/gallon.

Some states and municipalities are departing from the user-pays principle and resorting to taxes unrelated to the amount of driving. Virginia recently dedicated a portion of taxes on insurance to road and transit projects. In Massachusetts over a billion dollars to cover cost overruns on the Central Artery Tunnel are being raised in bonds issued on the security of revenues from statewide increases in vehicle license fees. Various states, especially California, have encouraged counties to levy general sales tax to finance transit and roads. The use of sales taxes and general fund taxes for roads is a major departure from the user-pays principle. These taxes' incidence bears no relation whatever to the use of roads and the benefits users get from them. Moreover the revenue stream bears no relationship to any objective assessment of investment needs. *The Future of California Highway Finance* report called for a recommitment to the principle of user-pays financing with special attention to the potential for tolls, as the user-fee best able to be fine-tuned to fairly cover costs imposed.[9]

It is increasingly doubtful that the political process can even approximately raise and allocate needed resources to roads. Public debate of the issues is befuddled by claims that new road construction is "impossible," that it cannot relieve congestion, or that expensive rail transit can substitute for it, and so forth. Road authorities have virtually given up the practice of systematically studying benefits and costs and estimating payoffs from road projects. "Needs" lists have become little more than lists of what is deemed politically acceptable, not as previously, those projects that promised quantified benefits in excess of

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[8] Federal Highway Administration and Federal Transit Administration, *1999 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance, Report to Congress, Executive Summary* (Washington, D.C.: U.S. Department of Transportation, FHWA-PL00-017), p. ES-13.

[9] Brown, DiFrancia, et al., *The Future of California Highway Finance*, p. 10.

estimated costs. As the California highway finance study points out: “the state stopped producing official (roads) needs studies of any kind in the early 1990s.”[10]

In these circumstances practical people are looking for self-funding road projects—situations where analysis shows motorists are very likely to pay enough in charges (tolls) for a new or enhanced roadway facility to service the construction debt and pay operating costs. This approach does not depend on any grand plan for reforming federal, state or county transport planning, or any campaign for any new source of money. It works within the status quo and says: Let's encourage local communities to examine their situation and look for opportunities for user-charge (toll) projects that can completely, or substantially, generate a stream of toll revenue sufficient to attract investment capital. It is less important whether it is a public agency or investor-oriented group than that the principle of self-funding road projects be examined.

[10] Ibid, p. 55.

Part 3

Tolling's Populist Opposition

At a time when major new investment in highways is needed, many public officials have too quickly dismissed the possible role of tolls. Such officials often overlook the economic realities of highways, and sometimes campaign against either existing or proposed tolls. Too often they opportunistically pitch the prospect of no-tolls, in the absence of an honest discussion of the alternatives. Important road systems have been put in jeopardy in recent years by populist political appeals promising "free" roads. Here are some recent examples.

A. Removing Tolls from Existing Systems

1. Illinois

The whole Chicago tollway system was called into question in the fall of 1999 when Republican Gov. George Ryan reacted, apparently extemporaneously, to a statement presaging toll increases by Art Philip, the chairman of the tollway's board, whom he had just appointed to that position. Ryan declared that not only were toll increases unacceptable—even though Chicago has some of the lowest tolls in the country and needs to do major rebuilds—but that tolls were a "nuisance" and he wanted to find a way of paying off the tollway bonds and getting rid of tolls altogether, and transferring the roads to the state department of transportation (DOT).[11] He appointed a close personal aide, Tom Cuculich, as the tollway's new executive director and asked him for a report on how to implement his toll elimination proposal. As it happens Cuculich was converted into a toll supporter in three months of studying the options, and the governor has been weakened by a developing scandal over sale of truck driver licenses by his political henchmen. So the Illinois tollway system, one of the nation's largest, seems to have survived.

2. Miami-Dade County

In February 1999, the Democratic mayor of Miami-Dade, Alex Penelas, reacted to a toll increase voted by the Miami-Dade Expressway Authority saying he would abolish tolls and institute a new one-cent sales tax to make up for lost toll revenue and also fund various rail transit lines he favored. The mayor had no direct jurisdiction over tolls or the toll agency, but at his urging the state legislature passed a bill giving the Dade County commissioners the power to abolish tolls if they identified alternative revenues. Penelas took the sales

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[11] "Illinois Governor Calls Tolls 'Nuisance'—Looking at 'Creative Alternatives'," *Toll Roads Newsletter*, no.42 (September 1999), p. 1.

tax to popular ballot, where despite press and establishment support the measure was overwhelmingly defeated—by a 68 to 32 percent margin.[12] So tolls remain in Miami, but the Mayor's anti-toll moves forced the toll authority to cancel planned bond sales and delayed a start on new construction on the toll roads nearly a year.

3. New York State

On January 27, 2000 the board of commissioners of the New York State Thruway Authority unanimously approved a plan for routine toll increases based on a recognized construction cost index (CCI). The chairman said the plan would avoid the need for occasional "massive hikes" while allowing the toll system to support a six-year $2.6 billion capital program. Tolls would have increased 2.2 percent annually the past three years if such a CCI-linked toll plan had been in effect. The plan involved a cap on toll increases in any year of 3 percent, and constant toll rates if the index should decline. The plan met vociferous, bipartisan opposition, being denounced by both Democratic Senate Majority Leader Joseph Bruno and Republican Gov. George Pataki. Pataki formally wrote to the Thruway asking it to "look for alternative financing." In the face of this pressure the Board canceled the planned 1.8 percent increase in toll rates in 2000. It is unclear what alternative revenues a toll agency has to tolls.

Important road systems have been put in jeopardy in recent years by populist political appeals promising "free" roads. Here are some recent examples.

4. Orange County, California

This conservative, Republican suburban county has been the state's pioneer in introducing toll roads to the land of the freeway. But California's move toward tolls has been in spite of virulent attacks on the principle of charging motorists for road use. The present state treasurer, previously majority leader of the Senate, Bill Lockyer (Dem.) is always quick to call toll roads "highway robbery" and special tolled express lanes "Lexus Lanes." In late 1999/early 2000 the proposed sale of the privately developed 91 Express Lanes led to a new round of attacks on tolling. An influential and thoughtful Republican Assemblyman, Tom McClintock, who is usually an articulate supporter of added roadway capacity, has called for the state to buy out the private firm's franchise and remove the tolls on 91-Express and has opposed other projects being tolled—even though in so doing he reduces the money available for added roadway capacity.

B. Opposing New Toll Projects

1. Maryland-Virginia

The Washington Beltway's (I-495) Wilson Bridge over the Potomac River needs major replacement. Though only 35 years old, the six-lane steel girder bridge carries 180,000 vehicles a day but operates for many hours

[12] "Miami FL Mayor Lobbies to Kill Toll Agency," *Toll Roads Newsletter*, no. 38 (April 1999), p. 1; "Miami Voters Reject Tax to End Toll," *Toll Roads Newsletter*, no. 41 (July/August 1999), p. 1.

each day at stop-and-go speeds. North-south I-95 had been designed to go directly through the District of Columbia but anti-road activists blocked that only a few years after the Wilson Bridge opened. The bridge got stuck with I-95 traffic as well as Beltway traffic. It needs to be 10 to 14 lanes, depending on projections. Together with rebuilds of four interchanges on the approaches in Virginia and Maryland the new crossing is a $2 billion plus project. No crossing of this scale has ever attempted financing without tolls, and the Metropolitan Washington Council of Governments in the feasibility studies designed tolls and modeled the impacts of tolls on traffic. Preliminary designs showed toll plazas. However in unplanned remarks to a journalist, Democratic Maryland Gov. Parris Glendening said that collecting tolls on the Wilson Bridge was out of the question because it would "defeat the purpose" of the project in relieving congestion (ignoring the growing use of electronic toll collection). On the western side of the Potomac, Virginia's Republican Gov. John Gilmore reportedly regards tolls as taxes, so his administration won't look at any new toll projects.

The use of sales taxes and general fund taxes for roads is a major departure from the user-pays principle. These taxes' incidence bears no relation whatever to the use of roads and the benefits users get from them.

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2. Washington State

Faced with major traffic congestion problems and limited gas-tax resources, Washington legislators in 1993 unanimously adopted legislation to create a public-private partnership program, under which private firms would bid for long-term franchises to finance, build, and operate toll-funded additions to the freeway system in the Seattle-metro area. Following spirited bidding, six out of 14 proposals were accepted, and the state DOT negotiated franchise agreements for some $2 billion worth of projects. However, the fact that these new roadways would come with tolls led to a populist backlash. Groups such as TRUST (Tolls Represent Unfair State Taxes) and CAUGHT (Citizens Against Unfair Gouging Highway Taxes) helped elect a number of populist-conservative Republican legislators in November 1994.[13] That led to major legislative changes to the partnership law in 1995, which had the effect of killing all but one of the approved projects (the twinning of the Tacoma Narrows Bridge).

3. Minneapolis

October 9, 1997 Republican Gov. Arne Carlson called his transportation secretary James Denn and firmly ordered him to kill an about-to-go toll buy-in scheme for the HOV lanes of I-394, a major radial motorway running west out of the center of Minneapolis. Denn was left to find a face-saving way of dropping a project that he had heavily promoted and which had been accepted by the twin cities Metropolitan Council, after about three years of debate, planning, public consultation and study. The governor was apparently reacting to a populist attack on the project by Mark Dayton, a rich liberal candidate for Democratic primaries for governor.[14] It is clear that the project was unpopular with a vocal group, but it had been approved by all the organized constituencies, including the legislature, local governments, and the metro planning body, as a

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[13] "Wash. State $2 Billion Private Road Projects Forced to Apply the Brakes," *Privatization Business* (April 3, 1996), p. 1.

[14] "MN-394: Guv Quietly Kills HOT Project," *Toll Roads Newsletter*, no. 21 (November 1997), p. 7.

worthwhile experiment. Dayton failed to get nomination and the Republican (and also the Democrat) candidate subsequently lost to independent Jesse Ventura, who had not weighed in on the issue.

4. Interstate Tolling Option

In March 1997 the Clinton Administration released its proposals for the successor legislation to the ISTEA program under which federal gas tax money is dispensed to the states. Their draft bill proposed that it be left to the discretion of the states whether tolls were to be imposed on Interstate highways to raise money for their upkeep or expansion and modernization. The Republican leadership reacted with bombast. House Speaker Newt Gingrich said that the Administration was "keeping all the (gas tax) money hidden away" in highway trust funds and added: "The President called for toll roads on the Interstate. Now this is double taxation." His Senate colleague majority leader Trent Lott dismissed the idea saying "I don't think that's an idea that is going to go very far."[15] Other Republicans chimed in with the phrase that this was "highway robbery."

Opinion surveys show the public is fairly evenly split between tolls and taxes as the best way to finance roads—if anything they seem more often opposed to tax financing of roads than to toll-financing.

Part of this was reflexive opposition for opposition's sake, but partly it was a failure to think through the principles at stake. Gingrich and Lott normally represent the party that favors both the user-pays principle (over taxation) and states' rights. Yet here they were opposing a user fee and opposing a proposed delegation of power to state governments of whether to toll, or not to toll, to support their major highways. AASHTO, the Washington lobby for the state DOTs had explicitly adopted a policy: "Tolls should be allowed on all Interstate roads so long as revenues are used in that corridor..."[16] In addition, in its proposals for new legislation AASHTO called for the right of states to toll Interstates.

The resulting reauthorization measure, TEA-21, included Section 1216 (b), a modest pilot program under which states were permitted to apply to the U.S. Secretary of Transportation for permission to use tolls to support reconstruction or rehabilitation on presently untolled Interstate highways. The legislation allows tolling on up to three Interstates. When Arkansas DOT drafted such a proposal, it was denounced by a coalition of trucking and taxpayer groups as "double taxation" and "erecting toll booths on the Interstate." Faced with a well-organized and vocal campaign against the idea, Gov. Mike Huckabee eventually withdrew the proposal.

C. Implications

Elected officials are made extremely wary of any new tolls by organized anti-toll campaigns, though it is unclear how far they resonate with the public. Opinion surveys show the public is fairly evenly split between tolls and taxes as the best way to finance roads—if anything they seem more often opposed to tax financing of

[15] "The Big Issue: Tolling the Interstates," *Toll Roads Newsletter*, no. 14 (April 1997), p. 1.

[16] *Transportation Policy Book* (Washington, D.C.: American Association of State Highway & Transportation Officials, January 1997), paragraph H30.

roads than to toll-financing.[17] Tax increases are more often than not rejected when put to popular ballot. On the other hand tolls are often unpopular too.

Wherever motorists have to queue on a regular basis to pay their toll, many develop an animus against the toll agency and a yearning for a free road. This is notable in states like Illinois, New Jersey, and Massachusetts where inadequate toll plazas see queues of 40 or 50 cars per toll lane for hours each day. The toll itself, like any price, is resented if the payers feel they are not getting value for money, if the payment mechanism is regarded as unfair, and if it looms large in their budget.

With a toll there is a *direct* connection between the customer and the service-provider, just as there is in other commercial transactions.

A Toll Is Not a Tax

Some conservatives who oppose taxes also oppose tolls on the grounds that "a toll is just a tax." This is far too simplistic an assessment. A tax is a general government-imposed levy to meet general government spending needs. Most taxes are quite clearly divorced from any particular service the taxpayer receives. A fuel tax is a kind of hybrid, in that it is a "user tax"—charged in rough proportion to use and (in most states) dedicated to transportation spending. Far better focused are tolls. A toll is a price paid for a particular trip, much like a fare paid to ride an airplane, or the money paid to buy a hamburger. With a toll there is a *direct* connection between the customer and the service-provider, just as there is in other commercial transactions. The service-provider's income depends on satisfying the customers. You pay a gas tax and license fees regardless of any particular road trip you make. On a toll road, by contrast, there is customer choice: if you make the trip, you pay the toll; if you don't make the trip, you pay no toll.

[17] "Tolling can be a Tumultuous Business," *Toll Roads Newsletter*, no.38 (April 1999), p.1 reported survey in New Jersey showing 66 percent support for tolls and 23 percent for taxes in response to the question: "Do you think the toll roads should be financed by tolls from the people who drive on them or do you think the money should come from a source like a higher gasoline tax that affects all drivers?" More generally, tolling consultant Peter Greenbaum of Vollmer Associates reports that extensive polling has "shown that when the case for tolls is clearly presented, and the alternatives are apparent, the toll option is preferred." Peter Greenbaum, *Tolls and Politics Do Mix—Unfortunately*, International Bridge, Tunnel, & Turnpike Association, Madrid, September 26, 2000.

Part 4

Toll Roads in America Today

A. Overview

There are several ways to measure the extent and importance of toll roads today. The FHWA puts the length of toll roads at 4,927 miles which compares with 46,334 miles of Interstate highway and 9,213 of urban freeways and expressways.[18] Thus, toll roads constitute approximately 9 percent of the motorway-standard mileage. Some 2,965 miles (60 percent) of toll roads have Interstate designation, with the rest mostly being state routes. Toll roads are split 36/64 between urban (1,762 miles) and rural (3,164 miles).

FHWA statistics also measure the extent of tolled bridges and tunnels at 302 miles. That boosts total tolled facility mileage to 5,225 or just a shade below one-tenth of the total of motorway standard facilities in the country. Most large, busy bridges and tunnels are tolled. An informed guess would be that about 90 percent of the major crossings in the country (by traffic) are tolled and less than 10 percent are tax-supported.

In the latest year for which numbers are available (1998) total toll revenues were $5.4 billion. This compares with $90 billion total highway user revenues around the country. Thus, tolls represent 6 percent of overall revenues garnered from motorists for the use of roads.

B. The Turnpike Era

The Pennsylvania Turnpike was America's first big toll road in the era of the internal combustion engine. It was such a hit with the American public when it was opened, in the grim years between the Depression and World War II, that it spawned a set of similar turnpikes in other states in the eastern half of the country. Making use of abandoned railroad tunnels under mountain ranges, engineered throughout with pitch and curvature for a steady driving speed, minimum 600-foot sight distances, generous acceleration/deceleration lanes, a continuous central median to separate the directions of traffic, "trumpet" interchanges, the first to implement now-standard 12-foot travel lanes, the Pennsylvania Turnpike was a quantum leap forward in highway design when it opened its first major stretch of 160 miles in 1940. It cut the time between Harrisburg and Pittsburgh from about 6 hours on the old two-lane roads US-30 or US-22 to 2 hours 30 minutes.[19] The

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[18] U.S. Department of Transportation, *Toll Facilities in the United States: Bridges, Roads, Tunnels, Ferries* (Washington, D.C.: FHWA-PL-99-011, February 1999).

[19] Dan Cupper, *The Pennsylvania Turnpike: A History* (Lebanon, PA: Applied Arts Publishers, 1995), p. 18.

old roads had poorly engineered curves with long steep grades of 8-9 percent while the Turnpike had maximum grades of 4-5 percent.

The Pennsylvania Turnpike had been predicted by Thomas H. MacDonald—a long-serving federal highway official and a strong opponent of tolls—to have no chance of paying for itself and of servicing its debts. His Bureau of Public Roads predicted 260,000 vehicles/year in its first year. If the feds had had their way the Pennsylvania Turnpike would never have been built. Instead of 260,000 vehicles it carried almost ten times that in its first year—2.4 million. After the war it was extended west to the Ohio line and east to Valley Forge (327 miles, 1950) and by 1956 over the Delaware River into New Jersey.

Thanks to tolls, Pennyslvania had a modern self-financing highway spanning the breadth of the state. A collection of states followed suit in the post-war years with rather similar state-line to state-line turnpikes, many of these being designed as strategic spinal transport systems (see Table 1).

A glance at a U.S. highway map in the early 1960s would show that in the then-industrial heartland, many of the most important highways had been built as toll roads. From Augusta, Maine to Baltimore, Maryland, from New York to Toronto, from Boston to Buffalo, and from New Jersey to Chicago and beyond one rode turnpikes virtually all the way. There were many shorter toll roads, almost intraurban, as development filled in gaps between cities 20 or 30 miles apart.

Many of New York and Connecticut's strictly cars-only parkways built in the 1920s and 1930s were toll roads. These often followed small rivers and consisted of four lanes undivided. They had narrow (10-foot) lanes and had a mix of at-grade intersections and interchanges with abrupt ramps. They were often designed as much by landscape designers as by highway engineers and are picturesque, but not very safe. Their original objective was recreational travel. The idea behind them was that city-dwellers would benefit from weekend trips to the countryside by car, but soon they became routes for commuters and shopping and other general purpose travel. These included the Saw Mill River, Bronx River, Hutchinson River and the Sprain Brook Parkway in the New York City suburbs and the Merritt and Wilbur Cross Parkways in Connecticut.

Virtually all the great river and estuarial crossings of the country have been built as toll projects—from the George Washington bridge and Holland and Lincoln tunnels linking New York City to northern New Jersey, across to the great bridges that allowed San Francisco to grow into the Bay Area it is today with connections across the Golden Gate, across San Francisco Bay to Oakland and six other major bridges. Harbor cities like Boston, Baltimore, and the Norfolk/ Hampton Roads rely heavily on toll tunnels because with low-lying land and high ships the grades down-and-under a shipping channel are less severe than grades up-and-over. New York City's Manhattan island is linked with the boroughs of Bronx, Queens, Brooklyn and Staten Island with five toll bridges and two toll tunnels. The Delaware River has 12 toll bridges, the Hudson seven. Many border crossings U.S. to Canada and Mexico are toll bridges and one is a toll tunnel (Detroit-Windsor). Several dozen crossings of the Atlantic and Mexican Gulf barrier islands have been built with tolls. The most spectacular are the Chesapeake Bay bridge-tunnel near Norfolk, Virginia, the Sunshine Skyway in St. Petersburg, Florida, and the Ponchartrain Causeway near New Orleans. The great Mississippi River had many of its bridges originally built as toll bridges and the Crescent City Connection bridge in New Orleans remains tolled. In Washington state the Tacoma Narrows were first spanned with tolls. So was the Columbia River between Oregon and Washington states (at Portland-Vancouver and Longview).

Table 1: Major Toll Roads of the Turnpike Era					
Toll road	State	Opened	Length	Status	Notes
Saw Mill River Parkway, Bronx River Parkway, Hutchinson River Pkwy, Sprain Brook Pkwy	NY	1926-on	Approx 120 miles total	Most detolled	Cars only, narrow lanes, intended originally for healthful weekend recreation, now commuter roads
Merritt, Wilbur Cross Parkways	CT	1930s	90 miles	Detolled in 1980s	Cars only—counterparts to NY parkways
Pennsylvania Turnpike	PA	1940	160 miles (1st stage)	Tolls	First modern US highway, links Philadelphia, Harrisburg and Pittsburgh, OH Tpike
Maine Turnpike	ME	1947	47 miles (1st stage)	Tolls	First toll road financed entirely with revenue bonds
New Hampshire Turnpike	NH	1947	15 miles (I-95)	Tolls	Heavy cross-state travel, three more toll roads added later
New Jersey Turnpike	NJ	1951	142 miles (total)	Tolls	Widest US toll road with 4 roadways, 14 lanes
Garden State Parkway	NJ	1954	173 miles	Tolls	Northern sections cars-only, parts untolled
New York State Thruway	NY	1954	639 miles	Tolls	Longest toll road and largest grossing
Connecticut Turnpike	CT	1955	120 miles	Detolled 1985	Toll plaza wrecks destroyed tolling
Illinois tollways	IL	1954	273 miles	Tolls	System of four major toll roads in western part of Chicago
Ohio Turnpike	OH	1954	241 miles	Tolls	Cross-state traffic, heavy truck route, now getting more commuters
Indiana Toll Road	IN	1956	157 miles	Tolls	Major truck route
Massachusetts Turnpike	MA	1951	135 miles	Tolls	Detolled rural section for cars, no tolls Central Artery
Delaware Turnpike	DE	1963	11 miles	Tolls	Predominant through-state traffic
John F. Kennedy Memorial Highway	MD	1963	43 miles	Toll	I-95 now, ramps detolled 1982
Dallas-Fort Worth Turnpike	TX	1957	32 miles	Detolled 1978	Texas first toll road, detolled after bonds pd off, now I-30
Richmond-Petersburg Turnpike	VA	1958	15 miles	Detolled 1992	Part of I-95, detolled for political gain
Kansas Turnpike	KS	1956	236 miles	Tolls	Rural turnpike
Denver-Boulder Turnpike	CO	1952		Detolled 1975	Bonds paid off 1967 & detolled
Oklahoma Turnpikes	OK	1953	567 miles	Tolls	System of ten toll roads
Florida Turnpike	FL	1957	376 miles (1999)	Tolls	State kept main north-south turnpikes but most urban roads spun off to Miami, Orlando, Tampa authorities
Miami-Dade Expressways	FL	1961	31 miles	Tolls	4 urban toll-expressways transferred from state Dec 1996
West Virginia Turnpike	WV	1957	88 miles	Partly-detolled	In 1989 ramp tolls taken off after feds funded widening
Orlando-Orange County Expressway Authority	FL	1963	90 miles	Tolls	System of 4 urban toll roads

Source: various issues of *Toll Roads Newsletter*

C. From Tolls to Taxes: The 1956 Watershed

Federal officials talked about an interstate highway system from the 1930s onward. President Franklin D. Roosevelt proposed a grid of superhighways east-west and north-south. As he envisaged it they were to be toll roads, and also to be financed by a betterment tax on the appreciation of land values for several miles on either side.The betterment tax proposal aroused fierce resistance, not the tolls. But the agency responsible for federal aid, the Bureau of Public Roads, was fiercely opposed to tolls and under President Eisenhower they vied with the Treasury and Eisenhower's personal advisers over whether the interstate system should be tolled or free. As it turned out Senator Harry Byrd (D., WV), chairman of the powerful Finance Committee, resolved the matter by declaring in 1956 that he would not allow any financing mechanism for interstate highways that involved incurring new debt. It had to be pay-as-you-go, or it wouldn't pass his committee.[20]

Byrd wasn't against tolls as such, just debt, but usually tolls were adopted in support of new debt, so the only financing mechanism that was going to pass the upper house was a federal gasoline tax. The existing toll roads were grandfathered into the new Interstate system, and indeed for a decade and more they formed its backbone. The 1956 legislation provided, however, that federal funds would be used only for construction of free roads in the ratio of 80 percent federal funding to 20 percent state matching grants. Moreover the legislation allowed federal grants to be made to retire the debt of state toll roads, so that they could be de-tolled.

Only after some years of the Interstate highway program did it become apparent to voters that the federal gas tax would not fund all the new highways that were needed, and that if they wanted a new road, the alternative in many cases was: toll road or no road.

The federal gas tax was seen as a painless way of paying for the new highways that the country needed. This changed the politics of toll roads, profoundly. If Uncle Sam was there, ready and able to fund free roads, why should any elected official ask his constituents to support a new toll road? In this environment new toll road projects dried up.

During the decade after 1956 many toll roads already in the pipeline were completed, but few new ones were initiated. Virtually all startup projects were 80/20, later 90/10 federal/state tax-funded roads. The early 1960s to the late 1970s were lean times for people constructing new toll roads.

During this period a number of established toll roads received some federal support—usually for new interchanges to improve connections to the rest of the road network— but they got the money only after they signed a "tri-partite agreement." In return for federal funds, the toll agency, the state DOT and the USDOT jointly (hence "tripartite") agreed that when the bonds issued for the financing of the toll road were paid off, tolls would be abolished and the ownership and control of the facility would transfer from the toll agency to the state DOT. Tolling would die. These tripartite agreements were an important manifestation of the federal government's hostility to tolling through to the late 1980s. The Dallas-Fort Worth Turnpike died in 1977 on account of such a detolling agreement, and federal endorsement of the idea of abolishing tolls made it an

[20] Tom Lewis, *Divided Highway: Building the Interstate Highways* (New York: Viking, 1997), p. 114.

uphill fight for state and local officials to argue for their permanence. In the case of the Indiana Toll Road, it repaid its federal grants in order to avoid the fatal provisions of a tripartite agreement.

Only after some years of the Interstate highway program did it become apparent to voters that the federal gas tax would not fund all the new highways that were needed, and that if they wanted a new road, the alternative in many cases was: toll road or no road. Meanwhile the promise of using federal money to pay off the debts of state turnpikes was quietly forgotten—new highways (and later on, maintenance) were always a higher priority than money to retire toll road debt. In addition, the 1960s and 1970s were a period of strong inflation, especially in construction and right of way acquisition costs, while the gas tax was levied in cents/gallon. The gas tax was buying less and less road. It became apparent in some states that the federal program would take decades before it could finance the needed highways. Furthermore there were roads which officials and planners saw needed upgrading to Interstate highway standards but which could not muster the support to get designated for federal aid. Increasingly federal aid was pushed away from new road construction to reconstruction of older highways, maintenance, and even to rail transit.

Part of the resurgence of interest in urban toll roads is a growing number of public-private partnership laws, inspired by the global trend toward meeting the need for major new infrastructure via long-term private franchises.

D. The Rebirth of Toll Roads in Urban Areas

The inadequacies of the gas tax program led to a revival of toll road construction in the 1970s and ‘80s, and some co-existence of new toll roads with free roads. In this second wave, major toll roads have been developed in the largest cities in Florida and Texas, several urban areas in Virginia, Denver, and in Orange and San Diego Counties in California (see Table 2).

Part of the resurgence of interest in urban toll roads is a growing number of public-private partnership laws, inspired by the global trend toward meeting the need for major new infrastructure via long-term private franchises. Virginia in 1988 and California in 1989 enacted the first such laws; as of 2000, legislation of this type for transportation infrastructure has been enacted in 16 states. New toll roads developed under these laws are in operation in Alabama, California, and Virginia, and there are new toll bridges in operation in Missouri and Puerto Rico. Public-private toll roads are under construction in South Carolina and Texas.

Nevertheless, the number of projects actually built is far fewer than many of the proponents of these measures expected. The fact that privately owned projects cannot make use of tax-exempt bonding (as state toll agencies can) puts such projects at a significant disadvantage in terms of financing (debt-service) costs. And as noted in Part 3, a number of proposed public-private toll projects have been rejected due to political opposition to the introduction of tolling (including proposed projects in Arizona, Minnesota, Virginia, and Washington).

Table 2: Modern-Era Urban Toll Roads				
Name	State	Date	Length	Notes
Selmon Crosstown Expressway	FL	1976	18 miles	East-west toll road through Tampa FL, now getting innovative elevated reversible lanes
E-470	CO	1992	41 miles	Half-beltway around eastern side of Denver connecting to airport
Veterans Expressway	FL	1994	15 miles	Disappointing traffic on toll road north of Tampa
Orlando	FL	1967	88 miles	Urban system of five toll roads
San Joaquin, Foothills & Eastern Toll Roads	CA	1994	69 miles	Toll road system being built by Transportation Corridors Agency in Orange county, S. California
Georgia-400	GA	1994	6 miles	Radial to north of Atlanta
Dallas North Tollway	TX	1968	20 miles	Radial to north of Dallas
Sam Houston Tollway	TX	1992	61 miles	Beltway around Houston
Hardy Toll Road	TX	1988	22 miles	Radial to north of Houston
Dulles Toll Road	VA	1984	9 miles	Radial to western suburbs N Virginia
Powhite Parkway	VA	1973	14 miles	Radial to southwest of Richmond—sections operated by city, VDOT
Richmond Downtown Expressway	VA	1976	2.5 miles	Richmond Metropolitan Auth
Dulles Greenway	VA	1995	14 miles	Extension of Dulles Toll Road from airport to Leesburg VA, privately developed
91-Express Lanes	CA	1995	10 miles	Toll express lanes in middle of SR-91 Freeway, privately developed
President George Bush Turnpike	TX	1999	27 miles designed	Half loop around north of Dallas
Mon-Fayette Expwy	PA	2000	11 miles	Start of 73-mile toll road system to south of Pittsburgh which will include a southern beltway
Wetumpka Expressway	AL	1997	< 1 mile	Developer-built toll bridge in Montgomery AL, one of 3
Foley Beach Expressway	LA	2000	5 miles	Privately developed bridge over Intra-Coastal Waterway and toll road
Greenville Southern Connector	SC	2001	16 miles	Privately developed project to be operated by non-profit
Western Expressway	FL	2000	10 miles	First section of 28 mile western peripheral toll road in Orlando area, OOCEA prev had 78 miles toll road
Suncoast Parkway	FL	2002	42 miles	Florida's Turnpike project north of Tampa
Camino-Columbia Toll Road	TX	2001	21 miles	Privately developed toll road to new border crossing
Polk Parkway	FL	1999	25 miles	Southern & eastern belt around Lakeland, midway getween Tampa and Orlando—FDOT
895-Connector	VA	2001	7 miles	Toll road to airport & industrial areas from southern section of state capital Richmond

Source: Various issues of *Toll Roads Newsletter*

Another important development in tolling is the concept of HOT lanes (High Occupancy free/others Tolled).[21] This approach enables underutilized HOV lanes to be better used by admitting a managed number of extra vehicles paying a toll. HOT lane conversions have been implemented on under-used HOV lanes on I-15 in San Diego and on the I-10 Katy Freeway in Houston. A variable toll rate enables road managers to meter traffic volumes in order to prevent the lanes becoming overloaded. On I-15 true dynamic pricing varies the toll in real-time in response to traffic counts from inductive loop sensors in the pavement. By anticipating overload, and discouraging some motorists, variable pricing can prevent the traffic flow breaking down and thereby maintain free-flow travel for those whose value of time is especially high.

Tolling is no longer an all-or-nothing affair. An extra lane, or lanes in an otherwise free roadway can now be tolled, as happens on the 91-Express Lanes, San Diego's I-15, and Houston's Katy Freeway. Of course, to attract patronage from free lanes they have to offer a premium service. There are some 2,200 lane-miles of HOV in operation around U.S. metro areas and about another 1,600 lane-miles under construction, or planned. Many of these are seriously underutilized. When presenting relatively "empty" roadspace right alongside heavy traffic, HOV lanes can generate passionate public opposition, and demands to "free" the lanes for unrestricted traffic. In some cases this is warranted but in many other cases, there would be more benefit in topping up the HOVs with toll-payers (making them HOT lanes).

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[21] Robert W. Poole, Jr. and C. Kenneth Orski, *Building a Case for HOT Lanes*, Policy Study No. 257 (Los Angeles: Reason Public Policy Institute, April 1999).

Part 5

The Revolution in Toll Technologies

Toll road patrons are now reaping the "peace dividend" from the end of the Cold War and its high-tech research. Cheap mass-producible transponders called radio frequency identification (RFID) tags were developed at the Los Alamos and Livermore national laboratories in the quest for "identify-friend-or-foe" devices to fix on airplanes, tanks, and equipment to reduce friendly-fire casualties. By illuminating a plane or tank with an inquiring radio beam and getting a return signal with a pre-programmed ID number it was possible to remotely establish that object as a friendly. Such tags were, like bar-codes, also deployed for the more mundane business of tracking and locating the immense variety of supplies and equipment that armed forces depend upon. A group of Los Alamos national lab engineers and Blockbuster Video entrepreneur David Cook formed Amtech Systems Corp in the mid-1980s to commercialize tags, and they became the world leader in RFID for freight railroad cars and in simple tags for remote tolling.

In June 1989, Amtech, supplying all the equipment at its own expense and risk, began the world's first electronic toll collection (ETC) system on the Dallas North Toll Road. "If it didn't work properly, or if for any other reason we didn't like it, they'd take their stuff away," was how the deal was described by Jerry Shelton, a senior official at the then Texas Turnpike Authority. Though Amtech has since been overshadowed in the North American toll market by Toronto-based companies Mark IV IVHS and SIRIT, the success of its innovation in Dallas in the late 1980s unleashed a revolution in tolling. Making use of components such as long-life batteries and RF technologies now mass-produced for wireless telephones, ETC transponders are now being used for about half the toll transactions conducted in this country and will soon be the dominant technology for taking tolls, displacing coin machines as well as human toll collectors.

Similarly optical pattern-matching technologies developed for the target-seeker heads of air-to-ground missiles formed the basis for automatic license plate recognition technologies now being deployed along with RFID transponders, as an alternative toll-collection mechanism or backup video enforcement system. On Toronto's new automated toll highway 407-ETR (Electronic Toll Route), close to 100,000 tolls per day are being collected by automatic license plate recognition (ALPR) technology using digital cameras developed by Hughes Missile Company (now part of Raytheon Company). The Hughes-developed system will also begin overseas operations in 2001 when the first section of the Cross Israel Toll Road opens. Similar European-developed technology is now in use in Melbourne, Australia. In the United States, these high-tech optical technologies are thus far being used only in the more limited role of backup to ETC for video enforcement—to identify vehicles using ETC lanes without a functioning transponder, either because they are violators or have a transponder that malfunctioned.

The combination of electronic toll collection (ETC) using RFID transponders to identify account numbers and image processing of license-plate numbers (ALPR) provides the technological base for moving toll collection away from toll plazas on the highway into data processing centers that will keep accounts and debit accounts. Bills and statements can be sent monthly by mail, by email, or be accessible by 800-telephone number or on a web site. An alternative approach, being adopted in Singapore, Japan, and Europe where smart cards or "electronic purses" are in wider use, is for the toll transponder in the vehicle to contain a smart-card interface. That way, the toll can be deducted from the smart card and paid directly to the toll agency without the need for the toll agency to even keep customer accounts. Further likely options available shortly will be to pay tolls by cell-phone or a wireless-enabled personal digital assistant (PDA) such as PalmPilot VII. Under the Federal Communications Commission E-911 mandate, wireless telephone companies will have to have in service by October 2001 automatic location equipment so that any cell-phone user who dials a 911 call can be located at the emergency services dispatch center. This locating technology is providing a whole new system for payment of tolls electronically, since a wireless telephone company could, with the agreement of the motorist, provide data to the toll company on trips made on the toll facility. Already there are 80 million wireless phones in use in the United States, and the number continues to grow rapidly, versus about 10 million ETC transponders.[22]

Transponders are now being used for about half the toll transactions conducted in this country and will soon be the dominant technology for taking tolls, displacing coin machines as well as human toll collectors.

As long as ETC requires a customer to establish a central account, obtain a transponder, and fix it to the windshield, there will be occasional users of toll roads who won't consider it worth the trouble. And indeed the fixed cost of supplying a transponder and maintaining an account for an occasional user will make the costs high to the toll agency. On many toll facilities occasional users are so numerous as to make up a significant portion of total patronage. These people need to be served in the short-term by maintaining some toll lanes with human collectors, or lanes which will take coins or allow a patron to self-swipe a credit card, as is common buying gas these days. Within a few years, however, it should be possible to move toward new payment methods such as license-plate-imaging, smart-cards, and PDA or cell-phone systems. A further alternative is that transponders will become ubiquitous, used for a number of purposes. Amtech recently announced a credit card-sized transponder that costs less than $10 (regular transponders are cigarette pack or CD jewel box sized and cost $20 to $40). Memory of 1,024 bits and processing logic are all built into a chip less than 1/16" thick and 1/4"x1/8" and the rest of the card is the metalized antenna. It will read reliably at up to 80 mph. The long-term market being sought is car registration stickers, in which case every vehicle would get one, and registration and vehicle identification numbers (VIN) would be read at speed, or by a handheld reader at a distance from the vehicle. Truck manufacturers are beginning to fit trucks with transponders in the factory. Auto manufacturers will eventually follow.

Concerns about the privacy implications are real—but can be addressed. When central customer accounts are maintained, as they are in most U.S. applications of ETC, it is possible to offer anonymous accounts (as offered in Dallas and Toronto). Customers periodically top-up the accounts by cash payment at a customer

[22] "Cell Phones as Transponders?" *Toll Roads Newsletter*, no. 45 (January 2000), p. 16.

service walk-in center. There should also be strict laws about the non-release of customer trip information. In systems where payment is made by smart-card, no customer accounts are even kept. Instead, the information about payments and account-balance are stored only on the smart card, which remains in the possession of the customer. In short, the Big Brother concerns of the new technologies are real, but should be manageable with proper laws and technology options to consumers.

The rapid spread of ETC at toll booths and plazas offers benefits for both drivers and the toll agency. For the former, ETC means no longer having to worry about having the correct change or getting stuck in long lines. For the agency, it means much-reduced need to add lanes to congested toll plazas, cost savings from handling far more customers with fewer people (see Table 3), and the good will that comes from alleviating much toll-booth congestion.

Table 3: Comparative Toll Plaza Throughput

Collection method	Vehicle speed	Tolls/lane/hour
Human collectors	Stop	250 to 500
Coin machines	Stop or near-stop	400 to 1,000
Lane-based retrofitted ETC	5mph to 35mph	1,000 to 1,500
Open road highway speed ETC	65mph	Over 2,000

Source: author, various industry reports published in *Toll Roads Newsletter*

New toll roads go to the next step in eliminating individual toll lanes and putting ETC equipment across a section of open highway on a gantry, similar to a big signage gantry except that it may be beefed up to resist movement in windy conditions. Electronic toll express (ETX as it is being called) enables motorists to maintain their full driving speed past the tolling point, making the tolling a completely non-intrusive part of the driving experience. Such lanes were built into two new toll roads in Oklahoma, the four toll facilities in Orange County, California, Denver's E-470, and Atlanta's Georgia-400. They are opening on the new President George Bush Turnpike in Dallas. With ETX 2,000 to 2,500 vehicles/hour/lane can be handled. This is the toll road of the future.

How long will it take established toll roads to get to "the future"? Houston's Harris County Toll Road Authority has been the most aggressive and has rejigged all eight of its mainline barrier plazas to accommodate ETX. Illinois will soon have ETX at five plazas but it still has 15 others to do. The Delaware Turnpike is so delighted with its first (new) ETX plaza on DE-1 that it is designing retrofit on the large I-95 toll plaza midway between Philadelphia and Baltimore. The New Jersey Turnpike has built its first ETX on the Pearl Harbor extension ready to roll when ETC starts late in 2000. The Orlando-Orange County Expressway Authority opened its first ETX lanes in July 2000 on the new Western Expressway (FL-429) and plans other ETX lanes on the East-West Expressway (FL-408) and Central Florida GreeneWay (FL-417.) The Garden State Parkway, the New York State Thruway, the Port Authority of New York & New Jersey, Miami-Dade Expressway Authority, Orlando Expressway Authority, and the North Texas Tollway Authority all plan retrofits.

ETX is not easily retrofitted in some plazas. Handling full-speed traffic through ETX lanes alongside toll collectors and traffic stopping to throw coins or pay a collector requires several hundred feet of protective concrete ("Jersey") barrier on both the approach and on the exit to allow safe diverge and merge movements

between the two streams of traffic. Many old toll plazas will need lengthening and extra slivers of land to accommodate this. Old toll plazas often lack a tunnel for toll collectors and services so their safety requires a pedestrian tunnel or overhead walkway to be built. Some toll plazas have off-ramps just a short distance downstream, which may allow safe weaving movements when all the traffic has had to stop to pay the toll, but becomes unsafe with highway speed traffic. Examples include the big Verrazano Narrows Bridge toll plaza on Staten Island and the Delaware Memorial Bridge plaza. At these locations ETX may wait on totally automated toll collection and the complete demolition of the toll plaza.

Part 6

The Advantages of Tolls

Tolls offer the potential to become the eventual replacement for today's declining fuel tax. But the case for tolls rests on more than simply the ability to raise needed highway revenue. This section reviews the many advantages of tolls. The following section will then address people's principal concerns about tolls.

A. Fairness

Fairness is the most fundamental argument for tolls. It is fairest if those who drive and make use of a roadway facility pay for it, whereas those who don't use the facility are not asked to contribute. And it is fairest if those who impose the most cost on others are asked to pay proportionately.

One major cost is pavement wear. This is a function of pavement design, adequacy of maintenance, freeze-thaw effects, vehicle weight per axle, and the design of the suspension. Toll roads generally charge heavy vehicles in ways that correspond more closely than fuel taxes with the degree of wear they impose on the pavement. The latest federal cost allocation study says that current highway charges "do a poor job reflecting costs at the heavier weights."[23] Single-unit trucks over 23 tons pay only 20 percent of the costs they impose, and combination trucks around the federal weight limit only about half their costs. Partially loaded tractor-trailers (under 32 tons) pay user charges *greater* than costs. It's the heavy dump trucks, tanker trucks and concrete delivery trucks—heavy single-unit vehicles—which stand out as imposing much higher costs on the road system than they pay in user charges. As axle loadings increase, pavement damage increases to the fourth power according to the rule of thumb used in these assessments, deriving from classic 1960s AASHTO research. The FHWA doesn't seem to take into account later research which suggests the fourth power rule only applies to certain types of pavement damage on certain types of pavement and that wheel arrangements and suspension are of great importance too.[24]

The FHWA report examines adjustments of the existing user charges, such as increasing gasoline or fuel taxes, eliminating caps and exemptions to others, but concludes that each effort to eliminate one inequity and

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[23] Jim March, *1997 Federal Highway Cost Allocation Study*, (Washington, D.C.: Federal Highway Administration, report HPP-10/9-97(3M)E, August 1997), p. IV-22. An update, *Addendum to the 1997 Federal Highway Cost Allocation Study*, FHWA-PL-00-021 HPTS/7-00(3M)QE, May 2000, shows that some of the distortions and inequities of the tax system have worsened since 1997.

[24] D. Cebon, "Interaction Between Heavy Vehicles and Roads," Buckendale Lecture, Society of Automotive Engineers, SP-951, Warrendale, PA., March 1993.

wrong incentive creates another. The only charges which really make economic sense are weight-distance and axle-weight-distance charges. Cebon summarizes current research as finding that pavement fatigue damage is related to axle weight, but rutting and bridge stressing are related to gross vehicle weight. Wheel bounce harmonics and resulting dynamic forces also need to be factored into road/vehicle design—and into charging.

It should be possible to develop win-win deals between truckers and toll roads to achieve more economic combinations of truck size, weight and configuration on the one hand, and pavement design and roadway geometrics on the other. Some of these possibilities have been discussed in the study *Road Work*,[25] which suggested that U.S. highway pavement in general is underbuilt but that larger truck combinations could usefully be allowed if pricing encouraged loads to be spread over more axles. The authors summed up one section: "Current policy not only creates inefficient incentives for truckers making choices of load and equipment but also deprives many truckers and shippers of the benefits from lower road charges that could accompany optimal investment."[26]

The Pennsylvania and Ohio turnpikes both weigh vehicles on toll plaza approach lanes and base their toll on weight classes multiplied by distance traveled—almost exactly the weight-distance user charge which the studies suggest is optimum for the nation's interurban highways. Longer heavier trucks (triples and doubles) than allowed on free roads are routine on the Indiana and Ohio Turnpikes, with special make-up/breakdown lots at strategic points near interchanges.

Toll roads can get past the emotional politicized treatment of truck issues in the national and state legislatures and consider the needs of both motorists and the road, in reaching mutually advantageous arrangements.

Fairness is the most fundamental argument for tolls. It is fairest if those who drive and make use of a roadway facility pay for it, whereas those who don't use the facility are not asked to contribute.

B. Large Project Scale

Many highway projects are characterized by what the classic economic textbooks call "indivisibility." They are large-scale projects. They need to be built in large chunks, or all at once, for maximum benefit to be gained. This is most obviously true in the case of a bridge, which has to span the whole width of a river before it is of any use at all. But even a new highway with interchanges along the way will often be used most efficiently if it is built over most of its planned distance as quickly as possible. Often on the cost side, too, economies can be achieved by spreading costs over a large number of similar bridges, built by specialized crews, or paving on a scale that supports large multilane pavers working continuously for a whole construction season. For this reason highways are most economically built completely in a period of 12 to 24 months.

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[25] Kenneth A. Small, Clifford Winston, Carol A. Evans, *Road Work: a New Highway Pricing and Investment Policy* (Washington, D.C.: The Brookings Institution, 1989).

[26] Ibid, p. 44.

Tax revenues are seldom available in large enough lump sums to support this kind of efficient programming for large highway projects. Only the capital markets (i.e., issuing bonds) can produce the large tranches of capital needed. Therefore the prospect of a toll revenue stream (or some other revenue stream, as with GARVEE bonds) allows capital to be mobilized so a highway can be built more quickly, and more efficiently, and its benefits gained earlier than the give-and-take and compromise with other projects that is inevitable in any divvying up of tax monies. And of these alternatives, only the toll revenue bond offers the prospect of adding to the net funding available for modernizing our highway system.

C. Better Investment Decisions (Less "Pork")

The availability of a dedicated and self-generated revenue stream improves decisionmaking. For example when money for maintenance of roads is competing in a general budget, or indeed in a state DOT, politics will inevitably factor into the allocation. Favors may be done for friends of powerful officials. Politically vulnerable districts may get more, while the districts of those on the political outs may be neglected. In many cases there may be decisions made, people employed, and contracts awarded, to "bring home the pork" for supporters. It may be pure chance if maintenance matches the need to preserve infrastructure long-term.

A toll authority will not be immune to these kinds of pressures, but if it has an independent board and staff, answerable to investors, or to multiple jurisdictions, it will have a greater likelihood of doing what is right in allocating maintenance and construction money. When it has to go to the capital markets for money it will have its projects rated by bond rating agencies. It will be forced by the requirements of the capital markets to hire independent consultants to evaluate its capital plan and the impact of proposed spending on revenues. Finally lenders will have the opportunity to say yes, or no, to providing the capital based on a hardheaded assessment of the proposed spending.

D. Customer-oriented Thinking

Toll agencies are generally more customer oriented than state departments of trnasportation. DOTs, like other agencies of the executive branch, need to have their funding voted by legislators in budget deliberations so it is natural for them to be responsive to key politicians. By contrast toll agencies derive their revenues from hundreds of thousands of motorists. Motorists usually have a choice whether they take the toll road or another road, so there is some pressure on the toll road operators to provide value for money. Not all are customer-oriented. Some have token board members and senior staff appointed by politicians. Some toll authorities have very little discretion in policy. But the self-financing nature of a toll road allows it to be consumer responsive if the politicians will allow it to be run as a business.

Toll agencies are usually aware that customers expect premium service because of the toll they are paying, so they generally make an effort to provide something extra—quicker salting and snow plowing, motorist assistance patrols, better maintained signage, lighting, guardrails, and the like.

E. Getting Outsiders to Pay

Tolls have been most compelling *politically* as a means of financing highways in geographically small jurisdictions, because in these a larger proportion of traffic is through (non-local) traffic. Delaware, for example, would no more give up tolls on the 12 miles of its I-95 that link Maryland to New Jersey than Saudi Arabia would ban oil extraction. That is because over 80 percent of the traffic is out-of-state, makes no local purchases, and therefore pays no gas taxes. Without tolls, the million people of Delaware who make little use of I-95 would be paying for its upkeep largely on behalf of out-of-staters. Nearly as compelling a case is made for tolls on the New Hampshire section of I-95, on the Tri-State Tollway (I-294/I-94) in Chicago, and on the major east-west highways of Indiana, Ohio, and Pennsylvania. Now that state-level institutions such as Texas DOT, Caltrans, and Florida DOT lack the funds and the political consensus to sponsor major roadway improvements, responsibility is being devolved to metro-area or county levels of government. Now the issue is: "Why should the citizens of Riverside County, California spend county tax revenues to repair the damage done to I-15 and I-215 by trucks traveling between San Diego and Denver? Or to pay for widening of those roads to cope with the growth of truck traffic?" Tolls are a convenient way to make sure that the users pay for the highways they use.

The prospect of a toll revenue stream (or some other revenue stream, as with GARVEE bonds) allows capital to be mobilized so a highway can be built more quickly, and more efficiently, and its benefits gained earlier than the give-and-take and compromise with other projects that is inevitable in any divvying up of tax monies.

F. Greater Safety

Toll roads are safer roads. The accident rate on toll roads is on average about a third less than on free roads. Toll roads are most appropriately compared with freeways and expressways—other roads with divided medians, grade separation from cross roads, access control, breakdown shoulders, etc. According to USDOT statistics, the nation's freeways and expressways had 8.6 fatalities per billion miles traveled in 1998. Data for toll roads from IBTTA show a fatality rate of 6.2 per billion miles traveled.[27] No one is quite sure why the figures turn out this way. It may be that a toll agency is a bit more focused on removing debris, salting and plowing snow, maintaining signage, removing hazardous objects, and doing a host of small things that reduce that help reduce the accident rate. State DOTs being much larger find it difficult to focus on these kinds of things. Many toll roads develop a certain pride and sense of camaraderie among their employees. They develop a pride in "their" road and perhaps for that reason work harder to maintain it in good condition. State DOTs tend to be larger bureaucracies with responsibility very dispersed and less sense of ownership of particular roads. Toll road employees are very aware that motorists pay to drive on them, and often say that on that account they "deserve" a better standard of road than the "free" state system can provide.

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[27] *Highway Statistics 1998* (Washington, D.C.: Federal Highway Administration, 1999) Table FI-1, and *1998 Accident Data US* (Washington, D.C.: International Bridge, Tunnel & Turnpike Association), an Excel file of data from member organizations.

G. Better Maintenance

Toll roads are generally better maintained than "free" roads. Debris and snow are more quickly cleared, damage such as pot holes or broken guard rails and railings are more quickly repaired. More rigorous preventive maintenance programs are in place. Greater efforts are made to maintain traffic through construction zones. This is possible because toll facilities have their own revenue stream from tolls. They don't depend on appropriations from the state legislature. In addition they usually have a special purpose staff dedicated solely to the maintenance of the one discrete facility. Management is well aware that patrons expect something better, having paid a toll, so they strive to provide quicker response to incidents. Many have roving patrols.

Why do toll roads expend more effort on maintenance? Because their bondholders demand it. Investors who put up the money to build toll roads are naturally concerned about being sure that the road continues to attract traffic throughout its life (or at least the lifetime of the bonds). Hence, the bond agreements contain stringent requirements on the road owner to spend adequate sums on ongoing maintenance, resurfacing, etc. Proper accounting techniques reflect the asset value of the toll road on the balance sheet, making the consequences of inadequate maintenance quite visible to parties whose economic interest is directly at stake.

Toll roads are safer roads. The accident rate on toll roads is on average about a third less than on free roads.

Comparable pressures to guarantee adequate maintenance are generally absent in the public sector. In fact, there are powerful pressures acting in the opposite direction, as noted by former New York State Comptroller Ed Regan:

> *When highways and bridges are regularly maintained, there is no press coverage. When they are rebuilt, it is an "event." There is a ribbon-cutting and plenty of press coverage. The incentives, therefore, are for public officials to purposefully starve the maintenance budget . . . . Until this motivation . . . is acted upon, we will be treated to recurrent infrastructure crises. In fact, proposals for infrastructure bonds, banks, etc. only abet this whole process.*[28]

H. Traffic Management

On heavily trafficked urban roadways, a motorist who joins the traffic flow when about 2,000 to 2,500 vehicles/hour/lane are already in the facility is imposing an especially heavy cost on fellow motorists. That is because, around that traffic level, motorists behind struggle for a safe and comfortable amount of headway, or clearance from the vehicle in front. They tend to slow to allow the car ahead to draw away, and in so doing they cause motorists behind them to do the same. The roadway is now seriously overloaded and traffic flow breaks down, and soon is actually carrying somewhat lower levels of throughput. With variable tolls, toll rates can be varied to anticipate these effects, and maintain free-flow conditions.

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[28] National Council on Public Works Improvements, *Fragile Foundations: A Report on America's Public Works* (Washington, D.C., February 1988), p. 21.

Variable tolls have been used to address congestion in a number of settings:

- by French toll roads to manage weekend peaks returning from vacation homes north of Paris;
- in southern California in the investor-financed 91 Express Lanes on the Riverside Freeway;
- in the toll-buy-in (HOT lanes) on the reversible HOV lanes in San Diego on I-15;
- on a pair of bridges in Fort Myers (Lee County), Florida;
- on the Katy Freeway (I-10) in Houston;
- on the new 407 fully automated toll road in Toronto.

Investors who put up the money to build toll roads are naturally concerned about being sure that the road continues to attract traffic throughout its life.

While the congestion-reduction benefits have been documented in academic studies only in several of these cases to date[29], news articles in every case report either significant reductions in previous congestion or (in the case of new capacity such as Toronto's 407) the ability to maintain free-flowing traffic at rush hours, thanks to variable pricing.

In late 2000 the New Jersey Turnpike became the first of the big toll agencies to implement a peak/off-peak differential. In southern California, besides the 91 and I-15, they have decided to introduce variable pricing on the three major new toll roads in Orange County (the San Joaquin Hills, Eastern, and Foothills). In Orlando variable pricing is expected to be announced soon on their three major toll roads.

Variable pricing is the key to using roads more efficiently and to managing them so they don't overload and break down into stop-and-go. It also tailors the toll rate more closely to the benefits of the trip because the time savings from using the free flowing road are greater in the rush hours than out of rush hours, so the different toll rates can be more closely matched to the benefits provided to the driver. As for the charge that such lanes cater only to the well-off ("Lexus Lanes"), studies of the actual usage of the 91 Express Lanes in Orange County find that users encompass a broad range of income levels.[30] In addition to affluent executives rushing to catch a plane, others willing to pay extra to bypass congestion include working mothers seeking to pick up a child from day-care before late-fees kick in and tradespersons seeking to make one more service call in a busy day.

[29] Edward C. Sullivan, *Evaluating the Impacts of the SR 91 Variable Toll Express Lane Facility, Final Report* (San Luis Obispo, CA.: California Polytechnic University, May 1998).

[30] Ibid.

Part 7

Addressing the Problems with Tolls

Despite the many benefits of tolls, their introduction often poses political difficulties. We now turn to ways of addressing the real—and perceived—problems that have plagued tolling in this country.

A. Toll Plaza Problems

Backups at toll plazas are the bane of many toll facilities. Lynn Fleeger, director of communications at the New Jersey Turnpike, told the author that backups and delays at toll plazas are the overwhelming source of customer complaints. It is easy to understand why this is such a source of frustration. For most of the trip on a toll road motorists can drive in free-flow conditions at 55 mph to 70 mph and feel that they are making good progress. Come the traditional toll plaza, however, and the contrast is striking. It is common to face long lines of sporadically moving vehicles that cost each patron delays of five to 15 minutes in peak hours. Time seems to move very slowly in such a situation.

Traditional toll plazas operating with backups involve other costs. They present a safety hazard—an increased incidence of rear-end collisions. Most of these are fender-benders but occasionally they involve serious injury. A number of bad rear-enders, several involving deaths at toll plazas on the Connecticut Turnpike in the early 1980s gave momentum to the movement that resulted in the abolition of tolls in that state in 1985. Idling and stop-and-start traffic generate high levels of tailpipe emissions, and contribute unnecessarily to air pollution levels. A further problem at traditional cash toll plazas is the loss of money by theft—usually somewhere on the "inside" but occasionally through armed holdups. Considerable security costs are incurred in attempts to deter such larceny.

As noted in Part V, electronic toll collection (ETC) is inexorably abolishing traditional cash toll plazas. Tolling is shifting from the toll booth to electronic funds transfers and the internet. No longer is it necessary to erect toll gates to force motorists to "STOP PAY TOLL" as instructed by the familiar sign on the approaches to a toll plaza. 91 Express Lanes is the first U.S. toll facility without onsite toll collection at all. 407-ETR in Toronto and Melbourne CityLink in Australia are much larger and more complex toll facilities which have dispensed entirely with on-site tolling and rely entirely on transponders, and license plate imaging to bill motorists.

Most American toll authorities have been more cautious, feeling the need to continue to offer the option of "STOP PAY TOLL" along with transponder-registered payments. But the transition is well under way to increased emphasis on remote toll payment and towards registering tolls at full highway speed in an open

road setting. One of the pioneers in implementing ETC was the Oklahoma Turnpike Authority, which made the move in 1990. They reported a 91 percent decrease in toll collection costs and a 100 percent decrease in toll plaza accidents.[31] Dramatic results such as these have sparked today's rapid shift to ETC by toll agencies nationwide.

The bottom line is this: We now possess the technology to phase out toll booths entirely over the next decade or two. If entirely new urban toll roads can be built and operated without toll booths in Melbourne and Toronto, then it is also possible for existing toll roads to make the transition to booth-less tolling. We need never construct another toll booth again, and we can get rid of all remaining toll booths—without giving up the many advantages of tolls.

B. Double Taxation

One of the major objections to tolls is that motorists traveling toll roads are paying twice. Not only are they being asked to pay tolls but they are being levied the regular fuel taxes, license fees, registration, and in the case of trucks, special tire taxes and weight-distance taxes. Auto clubs and trucking associations complain they are being hit twice.

The complaint is valid. It is not, however, an argument against tolls, but an argument against the levying of both tolls and taxes on the toll road. If tolling has other merits, as we have outlined, then tolls should be levied but the taxes should not be charged for vehicles when they are on a toll road. The fuel taxes and other so-called user-charges are intended to finance the "free" roads. They are already rebated in case of fuel purchases for off-road construction equipment, mining machinery, boats, farm vehicles, forestry and of course use of oil for heating (regular #2 heating oil is an identical product to diesel.) Any fuel in use off the "free" public roads should not, in principle, be taxed to generate revenue for the highway trust funds. Similarly other user fees are not in principle applicable to vehicles when they are on self-supporting toll roads.

In practice two arguments are used against such a policy change: (1) it is administratively impractical to rebate charges to vehicles on toll roads (2) state DOTs will lose substantial revenue for the "free" roads.

The administrative problem can be handled the same way it is handled in the case of other rebates. Trucking companies already keep detailed logs of their journeys and increasingly these are being kept by an onboard computer, so they have the data on toll road trips. Electronic tolling will be very helpful here too. Toll agencies keep central accounts of all trips by transponder-equipped vehicles for billing purposes. Those records could easily be used to generate estimates of fuel tax and other user-charge rebates due. Indeed toll companies could, with the permission of patrons, make the applications for rebates to the tax authorities, obtain the refunds, and apply them against the monthly toll account.

The concept has been implemented for trucks on a small scale both in Europe and the United States. In France, miles traveled on toll roads count as a rebate against an axle-weight tax that applies to trucks over 16 metric tons. The axle-tax is dedicated to financing the upkeep of non-tolled roads and it has always been a key feature of the tax that travel on toll roads entitles the toll patron to a per-km rebate. Trucking companies

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[31] Cited in Stephen R. Mueller and Dennis Polhill, *Let Those Who Receive the Benefits Pay the Costs: An Analysis of the Colorado State Government's Flawed Plan for I-25* (Golden, CO: Independence Institute, Sept. 15, 1999).

get a monthly bill which details kilometers traveled, which is accepted by the finance ministry as documentation of claims for rebates.[32]

The Massachusetts Turnpike has had in place since its inception a Turnpike Fuels Excise Refund Program. For many years it was little-known and almost unused. But recently it has been publicized and its claims process made somewhat less burdensome. Between 300 and 400 claims are made per year, with the refund costing the state about $2 million (as compared with $180 million paid in tolls). But the recent introduction of ETC has encouraged more people to file claims for refunds because the monthly Turnpike statements document their trips quite conveniently.[33]

New York tax law provides that trucks are not liable for the regular state weight-distance truck tax when they are on the State Thruway (toll road). This tax is 5¢/mile for a standard five-axle tractor-trailer of 80,000 lbs. This exemption offsets nearly half of the Class 5 truck toll of 12¢ per mile. The Thruway Authority would like the state to also provide rebates for the state fuel tax refundable for travel on the Thruway (as on the Mass Pike). For heavy trucks, this works out to about 3¢ per mile. This would bring the cost of truck travel on the Thruway within 4¢ per mile of the cost of tolls (12¢ per mile tolls vs. 8¢ per mile taxes on free roads).

We need never construct another toll booth again, and we can get rid of all remaining toll booths—without giving up the many advantages of tolls.

How much money would auto drivers save if such rebates generally available to vehicles using toll roads? In the case of the Illinois tollways, where cars pay an average of 3¢ per mile in tolls (40¢ for the average 13-mile trip), gas taxes alone are approximately 2¢ per mile, split about equally between federal tax of 18.3¢ per gallon and the Illinois state tax of 19¢ per gallon.[34] Thus, a rebate on gas taxes for Illinois tollway drivers would reduce their current out-of-pocket driving cost on the tollway by 40 percent. This would make toll roads relatively more attractive to drivers, and would presumably reduce the extent of opposition to expansion of the tollway system.

There are no comprehensive statistics compiled of vehicle-miles traveled (VMT) on toll roads at present so it is not possible to estimate precisely how much state governments would lose in revenues if they rebated gas taxes and other non-toll charges in order to end double taxation. But five major toll systems produce their own estimates (see Table 4). We can get an idea of the order of magnitude effects if we apply average highway user taxes to these numbers. In 1997, the nation's vehicles traveled 2,560 billion vehicle-miles and paid $40.3 billion in state and local highway user taxes, about 1.6¢ per vehicle-mile.[35] With inflation, the correct number is by now probably around 2¢ per veh-mi. Applying those numbers we get the "double-tax" numbers shown in the table. The fuel taxes levied on users of these toll roads—but of course not used at all to support them—are comparable with toll revenues in several cases and a significant element in others as shown in the table.

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[32] Robert Garin, U.S. representative of Egis, a French construction company, interview with author, September 8, 2000.

[33] Memo to the author from Patrick O'Mahony, Mass. Dept. of Revenue, Sept. 21, 2000.

[34] "Illinois Governor Calls Tolls 'Nuisance,'" *Toll Roads Newsletter*.

[35] *Highway Statistics* (Washington, D.C.: Federal Highway Administration, 1997), p. IV-9 and V-89.

Table 4: Impact on State Highway Funds of Fuel-Tax Rebate for Toll Customers					
	Veh-mi	Toll revenues	State fuel tax paid on toll road	State highway spending	Loss
NYS Thruway	9,772m	$392m	$195m	$3,686m	5.3%
Garden State Parkway	5,978m	$184m	$120m	$1,701m	7.0%
New Jersey Turnpike	4,941m	$360m	$100m	$1,701m	5.9%
Florida Turnpike	4,520m	$311m	$90m	$3,389m	2.7%
Oklahoma Turnpike	2,335m	$128m	$47m	$866m	5.4%

Sources: Vehicle-miles (col 2) and toll revenues (col 3) come from annual reports of the toll authorities. Column 3 is computed from tax rates and average fuel economy. Highway spending (col 4) uses data in Table HDF pIV-13, *Highway Statistics 1998* (Washington, D.C.: U.S. Department of Transportation). Col 5 is col 3/col 4.

Such rebates would need to be phased in over several years in the states where they loom large in the budget—especially in New Jersey. But imposing fuel taxes on toll road users is unfair and should not be done. The legitimate need of state DOTs for funding roads does not justify them in taxing vehicles which are outside of their system. If the lower net cost of using toll roads (after rebates are in place) encourages some traffic to shift from state roads to toll roads, then at least the DOTs will have reduced maintenance costs on their free roads. And the financial and political viability of tolling will certainly be increased. Further, the loss of revenue from ending double taxation would encourage DOTs to examine the way they do business, seeking ways to get more bang for the buck such as performance contracting and other forms of outsourcing.[36]

C. Diversion to "Free" Roads

The tolling of a road almost always reduces the traffic on that road compared to having it untolled, because there will be some motorists for whom the value of a trip is less than the toll. Some trips will simply not be made. Others may be diverted to an alternative road or to another mode. The extent of traffic reduction and diversion will depend on the extent to which alternatives are available, the amount of the toll, and the special characteristics of the area. For example, in the case of tolls on the new Wilson Bridge over the Potomac River in the Washington D.C. area, it was estimated that a $1.00 toll on cars would reduce traffic on the bridge by 30 percent and a $2 toll by about a half.[37] About half the traffic reduction would consist of diversion to other Potomac River crossings while the remainder would be trips no longer made—either because of people rearranged their affairs to avoid the need to cross the Potomac, or because they simply made fewer crossings.

Diversion to "free" roads is often a complaint lodged against the use of tolls. If a toll motorway is paralleled by a free motorway then congestion on the freeway is likely to drive traffic to the tollway. Examples of this occur in southern New Jersey where the New Jersey Turnpike runs alongside I-295 for many miles, and in southeast Florida where free I-95 runs parallel with, and often very close to Florida's Turnpike. In these cases motorists have a choice. If they do not want to pay a toll they take the free road and take their chances with congestion. If they want a more predictable and quicker trip they take the toll road. A toll could in theory be

[36] Adrian T. Moore, Geoffrey F. Segal, and John McCormally, *Infrastructure Outsourcing: Leveraging Concrete, Steel, and Asphalt with Public-Private Partnerships*, Policy Study No. 272 (Los Angeles: Reason Public Policy Institute, September 2000).

[37] "Washington D.C. area Woes: The Wilson Bridge's World Class Snarls," *Toll Roads Newsletter*, no. 4 (June 1996), p. 1.

imposed on the freeway to get a better balance between the traffic on the two parallel roads, though this is unlikely to gain political support.

A far more common case is where a toll motorway is parallel to a lesser-standard free road—an older style road with abutting properties of various kinds (uncontrolled access), maybe even curbside parking and traffic signals rather than grade separation at cross streets. A classic example of this is the New Jersey Turnpike between Trenton and Newark where it runs in much the same corridor as US-1, the old post road between Philadelphia and New York City. Or where New York City's free East River bridges compete with the Triborough Authority's tolled bridges and tunnels between Manhattan island and Queens and Brooklyn.

No doubt in these cases the lesser free facility gets more traffic as a result of the tolls. Various stick and carrot measures can limit this diversion. Sticks include restrictions on through traffic using the lesser free road, generous green time for cross traffic and turning at the intersections, and curbside parking. Carrots include efforts to attract and retain as much traffic as possible on the toll road by maximizing the level of service provided, improving access/egress and the operation of tolling points. There is no perfect solution to the issue of diversion but it is in the end a self-limiting problem. The better the toll facility is able to improve its service the less of a toll diversion there will be.

Most of the new generation of governmental toll authorities are keeping salaried staff lean and contracting out operations.

D. Toll Agency Institutional Problems

Some toll agencies have bad reputations, for reasons such as corrupt practices. At least one has seen senior personnel convicted of receiving kickbacks from contractors and concessionaires. Another is regarded as subservient to corrupt politicians in the pay of local merchants, and deliberately obstructive of convenient connections to the rest of the road network. Others are simply hated for their toll plaza backups, or are regarded as bloated self-perpetuating state bureaucracies. Some are regarded as "tax-collectors" for the state.

Some of these problems can be overcome by installing more professional managers—as opposed to political or patronage appointments, who change with the vicissitudes of politics. Longer terms for toll agency board members and the appointment of independent-minded persons can help a lot. Contracting out by competitive bid is standard practice for construction but it can be extended through a range of functions including maintenance and toll collection and customer service. Most of the new generation of governmental toll authorities are keeping salaried staff lean and contracting out operations. Examples are Orlando-Orange County Expressway Authority in Florida and the Transportation Corridors Agencies in southern California. But some established agencies have phased out large staffs in favor of contractors. Florida's state turnpike now contracts all toll collection and Illinois, Massachusetts, the New York and New Jersey toll authorities all employ commercial contractors to answer telephone calls from customers and to manage electronic toll accounts and billing.

The American tradition in this century has been to vest ownership and ultimate control of toll facilities in a state, county, or multi-jurisdiction governmental authority, though some toll operations are simply conducted

by a division of the state DOT. Full privatization is another option—having an investor-owned business own and operate the toll facility. The Dulles Greenway toll road in Virginia, 91 Express Lanes in southern California, the Detroit-Windsor tunnel, the Camino Colombia Toll Road in Texas, and several toll bridges in Alabama are the major examples in the US. Canada's major toll road 407-ETR is now investor-owned, as is the largest toll road operator in Italy, Autostrade, and major toll roads in Australia, Spain, France, the UK, Ireland, Hong Kong and many other countries.

Investor-owned toll operators—like investor-owned water and electric utilities—are subjected to varying degrees of government control. In most cases they operate under a long-term franchise to levy tolls, and often their capital structures revert to government ownership at the end of the franchise period—which may be as little as seven years and as much as 100 years. A few are fully private with perpetual investor title and rights.

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Privatization of toll facilities is an option that needs to be more fully explored in this country, since it reduces the extent of political interference and can offer the opportunity for a more customer-related, bottom-line concerned business operation. Investor-owned toll facilities may be better placed to leverage land development opportunities along the toll road corridor and to coordinate development and the design of the road. Further the public may be more accepting of toll roads run as businesses in investor ownership, than of toll roads run by government agencies. Few question the need for a business to charge for a service provided, whereas a government charging user fees is often denounced. The idea of tolls as a tax may derive in part from government ownership of the road.

Yet another advantage of investor ownership is the ability to operate across state borders. The Pennsylvania Turnpike, for example, as a state owned entity is restricted to toll operations in Pennsylvania, and the Harris County Toll Road Authority to Harris County, Texas. Indeed even within a state it often requires a legislative initiative to allow the toll authority to proceed with a new toll road. By contrast Italy's Autostrade SA, France's Cofiroute, Spain's CINTRA, and the Australian Macquarie Infrastructure Group own and operate toll facilities in many countries. They are able to spread their skills worldwide and generate career paths and opportunities for their staff that is unthinkable within a U.S. toll authority.

E. Non-businesslike Pricing and Financial Management

Businesses are constantly fine-tuning their prices, juggling their margin between costs and what the competition is charging—or "what the traffic will bear." Most toll authorities by contrast keep their toll rates frozen for years, often making a virtue out of the fact. Their accounts are often kept on a cash basis, often with little or no provision for depreciation. This can make their financial position look strong until they face the need to fund major reconstruction work. Then because no depreciation charges have been levied against past revenues and no toll adjustments made to keep in the black, they need radical increases in tolls to support bond issues funding the reconstruction. A profile of the "real toll" shows a long period of slowly declining

toll rates, followed by a huge rise—often a doubling or tripling of the toll. This makes toll increases highly contentious politically, and often the whole future of tolling is cast in doubt, as in the Chicago area in 1999.

Big toll changes are also unnecessarily disruptive to traffic patterns. In the early 1990s after the New Jersey Turnpike doubled toll rates trucking associations organized a boycott and heavily publicized alternate routes. There was a marked increase in truck traffic on parallel arterials, and many complaints from the communities affected. It took much of the decade before traffic patterns were restored. Toll roads, like other government agencies, are at last being pressed to adopt businesslike accrual accounting standards, under Government Accounting Standards Board rules (GASB 34), which will go into effect starting in 2001. This will require them to create real balance sheets and to set up depreciation accounts.

A further problem with a number of big-city toll authorities is that they are treated as tax agents to raise money to subsidize substantial recurring losses on transit. The Triborough Authority and the Port Authority in New York and the Golden Gate Bridge in San Francisco are examples of the misuse of toll profits to shield local taxpayers from the costs of expensive transit services. Ferries in San Francisco Bay for example cost over $10 per trip, only one-quarter of which is paid for by ferry riders and three-quarters of which comes from bridge toll profits. It is little wonder motorists are cynical about tolling when toll revenues are used as a kind of slush fund to support this kind of extravagance for a privileged few—tourists and a few residents with bayfront properties, being the principal ferry-users.

Proper pricing of toll facilities will require much greater independence from politicians seeking re-election—who always have an argument that toll increases should be held until their successor is in office. The successor has the same argument! Toll increases get put off, and put off, until a crisis forces the issue. Here again, corporatizing or privatizing toll agencies would insulate them from these pernicious political pressures.

Part 8

An Agenda for Policy Change

A. Overview

This policy study has sought to make the case that user fees (tolls) are better than taxes as the way to charge for and pay for highways. If this case is accepted in principle, the fact remains that the United States is a long way from relying on tolls. In the latest year for which numbers are available, total U.S. toll revenues were $5.4 billion, compared with $90 billion of total highway user revenues. What policy changes would encourage a greater reliance on tolls for motorway-standard highways and expressways? Since nearly all such roadways are owned and operated by the states, many of the policy changes will have to be made at the state level. But because the federal government is also a major factor in highway policy, changes at the federal level will be needed, as well.

B. State Policy Changes

Most of the rebirth of tolling in the 1980s and 1990s came about as state and metro area policy-makers found that traditional highway funding sources and allocation processes were simply inadequate to the task of keeping pace with burgeoning growth. And with federal policy in ISTEA and TEA-21 more favorable to tolling than ever before (as witnessed by the public-private partnership provisions, the Value Pricing program, and the abortive effort to permit tolls to be used for rebuilding a few Interstates), it is likely that states will remain in the forefront of expanding the use of both tolling and public-private partnerships. What state policy changes would foster this direction?

Any state wanting to increase the market share of tolled facilities should address the double-taxation issue, by providing for rebates of state fuel taxes for miles driven on toll facilities within that state. States that already have a large toll-road sector may need to phase in such rebates over a period of years to avoid serious short-term impact on their highway budgets for non-tolled highways. But as shown in Table 4, even in such states as New Jersey and New York, the impact of a state fuel-tax rebate would not be very large. In states with few or no toll systems, the creation of a rebate mechanism would remove an important obstacle to the creation of new tolled capacity that can help meet the need for better highways and urban expressways. In August 2000 the American Legislative Exchange Council, a membership organization of state legislators, adopted a policy

statement on toll roads that, while supporting expanded use of tolling, "opposes double taxation in the form of tolls and fuel taxes on the same facility."[38]

As noted previously, 16 states already have public-private partnership laws for transportation projects, under which the state can award long-term franchises for user-fee-funded infrastructure projects. While a few such measures (e.g., Texas, Virginia) reflect lessons learned from other states and overseas, others (e.g., California) are rather unsophisticated, pilot-program measures which are not attracting investor interest. All states wishing to make use of what the global toll road industry has to offer need to establish state-of-the-art public-private partnership measures that properly apportion risk and responsibility between the public sector and the private sector.

State governments also need to take the lead in obtaining the environmental and planning permits if they are serious about encouraging private sector toll roads. It is governments that lay down these requirements and governments which administer them. To ask investors to commit to toll projects and then to take their chances with such a highly politicized process adds greatly to the cost and risks of toll projects and the difficulty of raising capital.[39]

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C. Federal Policy Changes

The federal government has been involved in highway policy since the beginning of the republic. Article I, Section 8 of the Constitution gives Congress the power, among others, "To establish post offices and post roads." In recognition of their importance to trade and defense, the federal government has been involved in highways throughout our history. Toll roads should be largely self-funding and controlled by board of directors responsive to the motorists they serve and responsible to the investors who provided the capital for their construction, so there is no need for any direct federal role.

But indirectly the federal government plays a major role in determining whether toll roads are viable or not. Federal grants that pay 80 or 90 percent of the cost of new highway construction undercut the opportunities for tolling. Thus, a pro-toll federal highway policy could simply cease to provide federal highway grants for new construction and reconstruction of motorway-standard roads, reducing the federal gasoline tax proportionally.[40] That would leave it up to each state to decide the proper balance between tolls and taxes for

[38] "ALEC Set of Principles on Toll Roads," available at www.alec.org.

[39] Of the four toll projects granted franchises in California in 1991, only one, the 91-Express Lanes got built in a reasonable time, and that was because it was located entirely in an existing highway right-of-way and there were no environmental permitting issues. The second, SR-125/South in San Diego has taken nearly 10 years to break ground because of environmental and right-of-way issues. The third SR-57/South in Orange County is still bogged down in environmental issues because of its location in a floodway. The fourth, a toll road in the eastern part of the Bay Area met strong local opposition and was abandoned.

[40] Robert W. Poole, Jr., *Defederalizing Transportation Funding*, Policy Study No. 216 (Los Angeles: Reason Public Policy Institute, October 1996).

major highways and expressways. Maintenance and operations should be a state/local responsibility in any case. There would still be a federal role in highway research and development, standardization, and the maintenance of roads on federal properties. If defense considerations required a road to a higher standard, the federal government would pay for the difference.

A measure that would have devolved most highway funding responsibility to the states was sponsored by Sen. Connie Mack (R.-FL) and Rep. John Kasich (R.-OH) during the reauthorization of the federal highway program in 1997. Their estimate was that this greatly reduced federal role would enable the federal gas tax to be reduced from the present 18¢ per gallon to about 4¢ per gallon. Such a withdrawal of the federal government from direct involvement in construction and maintenance would be an enormous boost to self-funding toll roads.

The Mack/Kasich measure did not gain many adherents, because many members of Congress gain large political benefits from their involvement in directing federal highway grants to their state or district. So it is unlikely that the federal role will be reduced this dramatically any time soon. That said, there are several other ways in which federal policy could encourage greater use of tolling and the kind of long-term franchising that is bringing high-quality toll roads to much of the globe.

Federal research and development could play a role in hastening implementation of open road electronic tolling and the scrappage of old toll plazas.

First, in the next federal highway reauthorization measure, Congress could address the issue of phasing out toll booths. Congress could set a pair of goals for (1) initially having in place on every toll road at least one non-stop, highway-speed toll lane (ETX), and (2) later phasing out all toll booths on all toll facilities in that state. States achieving the first goal would obtain a modest addition to their federal highway revenues (perhaps from the Congestion Management and Air Quality program). States achieving the second goal would receive additional funding, which they could use to offset the costs of their state rebate (of fuel taxes) program. These measures should help win the support of auto clubs and trucking associations that have traditionally opposed greater use of tolling.

Federal research and development could play a role in hastening implementation of open road electronic tolling and the scrappage of old toll plazas. It could do this by working with toll agencies and providing them with selective assistance to implement programs to convert their systems to highway speed electronic tolling while looking after toll collectors that are laid off.

Another important federal policy change would be to equalize the tax treatment of toll-road bonds between the public sector and the private sector. The United States is virtually the only country in the world whose capital markets charge dramatically different interest rates (as much as two to three percentage points) for infrastructure revenue bonds, depending on whether they are issued by a government agency or a private entity operating under a government franchise. (Thus, debt-service costs can be about 30 percent greater for a private toll road project.) As explained by municipal-finance attorney Karen Hedlund, this disparity in tax policy has created a non-level playing field for much-needed private investment in America's infrastructure,

especially in the highway field.[41] Congress in 1999 passed the Highway Infrastructure Cost Savings Act (HICSA), which would have permitted up to 15 private toll road projects to issue tax-exempt toll revenue bonds on the same basis as government toll authorities, as a pilot program. But the measure was included in a comprehensive tax-cut bill, which was vetoed by President Clinton. Shortly thereafter, the measure's sponsor, Sen. John Chafee (R.-RI), passed away, thereby depriving the Senate of a champion of the idea of leveling the financial playing field.

[41] Karen Hedlund, *The Case for Tax-Exempt Financing of Public-Private Partnerships*, Policy Brief (Los Angeles: Reason Public Policy Institute, February 1998).

Part 9

A New Coalition for Tolling?

The most obvious group of supporters of a larger role for tolls in U.S. highways are those who support the user-pays principle, believing that road service will benefit from being brought into the regular business economy. Therefore supporters of the market economy should support a larger role for tolling. This should include Republicans—though oddly many Republican politicians have behaved on this issue more like politicians than like free-marketers. New Democrats should be among the strongest supporters of relying more on the market to supply road space and charging the users directly.

Once the double-taxation issue has been resolved, road-user groups should see advantages in an expanded role for tolling. Truckers stand to benefit to the extent that toll operators are flexible about seeking out win-win combinations of truck sizes and weight and roadway designs that allows more efficient trucking. The pickup and delivery business should see benefit in the freer-flowing lanes that properly managed tollways can offer. All for whom "time is money" stand to benefit from the option to pay a toll and fly past the congestion on free facilities. Motorist organizations such as the auto clubs should also be supportive of the pure-toll (i.e., without double taxation) option—insofar as it embraces non-stop convenient technology and produces roadway managers more responsive and motivated to provide motorists with a higher level of roadway service.

Many environmental groups are hostile to roads and road transport. They tap into frustration over the negatives of the automobile, especially congestion and pollution. More walking and bicycling, most of us know, will be healthful. Making more "walkable" communities is a good idea. But most realists recognize that rubber-tired motor vehicles are integral to the modern economy and way-of-life and that alternatives will only play a minor role. Vehicles traveling on free-flowing toll roads and on managed toll lanes are much cleaner in terms of tailpipe emissions than unmanaged stop-and-go traffic. Indeed, by imposing approximately the real costs of road travel on motorists, tolls do a better job of reducing traffic to its essentials than a whole panoply of tax-handout programs to foster alternatives to the car. A number of environmental and transit groups have begun supporting the use of tolls in urban areas. The Environmental Defense organization (formerly EDF) has even supported construction of new roadway capacity when it has been proposed as toll lanes.

Road builders are accustomed to thinking of their work as being "awarded" by government through federal and state budgets, so like Pentagon contractors they often see their prosperity as being dependent on how strongly they lobby for roads money in the government budget-making process. They might be better off, however, in an environment in which at least a significant proportion of road expenditure came from toll road operators responding directly to motorists' demands for a higher level of service on the roads—independent of the government budgeting.

Toll agencies themselves should be the strongest supporters of an expanded role for tolls, and for making tolling more businesslike. A growth industry offers more opportunities and interest than a stagnant, geographically restricted industry always under close governmental control.

Most important of all, it should be possible to reach out to important segments of the general public. Ninety-six percent of urban trips are made by automobile and 100 percent of deliveries, service calls and the ends of all goods movements involve roads. They are as central to the quality modern life and to economic productivity as electricity, telephones and fuel supplies. Yet the scale of road congestion and accident deaths indicates that roads are poorly managed. They are afflicted by bureaucracy and politics. The solution is to put the day to day operations of roads on a business basis—like electricity, telephones and fuel supplies. There isn't the same degree of under-investment and waste in these industries because of the incentives and disciplines of the market economy. We don't have the kind of chronic shortage of telephone capacity or electricity blackouts that we see in congested roads. The reason is that that they are businesses who see shortages as an opportunity to increase their profit. They are flexible in their pricing and they don't have to wait until the right time of the year to petition the legislature to get an extra budgetary allocation. They go out into the capital markets for funds and get on with the job.

Motorists stand to benefit most from a road system that is a series of self-financing business operations, the tolls providing them their revenues and a direct link with their customers.

Part 10

Conclusion

Tolls have traditionally financed our most spectacular roadway facilities. They were the only way to build bridges like the Golden Gate and the San Francisco-Oakland Bay bridges on the west coast, the George Washington Bridge and the Lincoln and Holland tunnels in New York City or the twin spans of the Delaware Memorial bridge that links the northeast and the mid-Atlantic states. When it was decided half a century ago to build a modern highway to span the whole of Indiana or Ohio and they wanted to open it in 30 months or so, tolls were the basis for the funding. We don't need as many spectacular new constructs like this now—though there are some we *do* need.

But thanks to technological advances, tolling can usefully be extended to the funding and managing of more mundane highways. It will help fund more environmentally acceptable facilities, such as sub-surface roads. It will allow us to get a lot of the politics and bureaucracy out of road service by making it possible to decentralize decision-making to the local level and bring road managers closer to their customers. The future will see a diversification of fuels and power sources for automobiles and trucks that doom gasoline/diesel taxes as the principal funding source for roads. Rather than cling to a sinking tax, it will be smart to adopt real pay-as-you drive user fees—tolls—as the preferred financing system of the future.

About the Author

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