

**SENATE FINANCE COMMITTEE**  
**Testimony on Financing Infrastructure**

by

**Gabriel Roth**

Civil Engineer and Transport Economist

May 17<sup>th</sup>, 2011

**Executive Summary**

This testimony is designed to show that, for two principal reasons, the federal government should fund no transportation infrastructure at all.

The first reason is that, in these times of financial stringency, government should not finance facilities for which users themselves could pay if they wished to cover the costs. For example, those wanting railroads should cover the costs themselves, and those wanting roads should pay more into the dedicated funds that support them. The US air, railroad, and road sectors have a long “user pays” tradition, and the current financial deficits require that this tradition be restored. Government funding for inter-urban travel can be eliminated for this reason alone.

The second reason is that federal payments currently support local services, such as mass transit, and other projects, to promote an undefined concept of “liveability”. Such payments do not seem appropriate for federal funding. Why should farmers in Montana be forced to pay for the travel of wealthier people in New York and Washington DC? If local services are to be subsidized, would it not be better for the funds to be raised from the localities that demand them?

These considerations do not apply to appropriations from the federal Highway Trust Fund, which receives dedicated revenues from road users, and has no claims on general revenues. Highway Trust Fund revenues could be increased by raising the dedicated federal fuel taxes but, because conditions vary from state to state, and because of the waste involved in the federal financing of state roads, it would be preferable to meet road funding shortages by raising state charges.

For the longer term, for reasons given in my testimony, consideration should be given to phasing out the federal Highway Trust Fund, and for turning back highway and transit funding to the states.

States are in a better position than the federal government to reform the current systems of owning, funding and managing highways. For example, they could introduce road-use charges based on distances travelled (rather than on fuel consumed), and give private

providers opportunities to maintain existing roads and provide new ones on a commercial basis, eliminating the need for government financing, even by “Infrastructure Banks”.

Abolition of federal financing is likely to encourage state and private sector funding, and successful reforms pioneered by some states could quickly be replicated in others.

## **SENATE FINANCE COMMITTEE**

### **Testimony on Financing Infrastructure**

by

**Gabriel Roth**

Civil Engineer and Transport Economist

May 17<sup>th</sup>, 2011

#### **Introduction: Arrangement of my testimony**

I would like to start by thanking Chairman Baucus for his flattering invitation to testify before the Senate Finance Committee, to explain why federal taxpayers should not be required to finance road infrastructure. My testimony covers four issues:

First, whether the federal government should have a role in financing transportation infrastructure;

Second, a description of private sector roles in the provision of roads;

Third, a description of a plausible alternative to relying on fuel taxes for highway finance; and

Fourth, a sketch of how a privately owned and financed road system might function.

#### **Federal financing of state roads**

Modern federal involvement in US highway finance was the result of the 1956 Highway Revenue Act that created the federal Highway Trust Fund to finance the construction of the Interstate Highway System. The federal Highway Trust Fund is funded by dedicated taxes on fuel. Accumulated revenues can be used to pay for up to 90 per cent of the project construction costs without having to borrow or to draw on general funds. The powers under this legislation were designed to expire three years after completion of the Interstate Highway System. However, although the system was deemed complete in 1996, the financing powers are renewed periodically and are still in force. They are now due to expire on September 30, 2011.

There are few advantages and big drawbacks to the federal financing of state roads<sup>1</sup>:

First, the fact that up to 90 per cent of highway costs are paid from federal funds gives states incentives to pay for low-priority projects. For example, the Boston “Big Dig” project, which grew in cost from \$2.8 billion to \$8.1 billion (both figures in 1982 dollars), would never have been funded by Massachusetts alone.

Second, over a third of revenues paid by road users are spent for purposes not directly related to their travel and safety. For starters, 20 per cent of revenues are put into a “Mass Transit Account”. Calculations made by Ronald Utt<sup>ii</sup> show that, in the latest highway reauthorization bill passed in 2005 (popularly known as SAFETEA-LU), road users receive for general-purpose roads and safety programs only about 62 percent of what they pay into the federal Highway Trust Fund.

Third, federal involvement raises road costs considerably:

- Federal construction specifications can be higher, which increases costs;
- The duplication involved by sending money to Washington DC, and back to the states, can increase costs by 10 percent of construction costs;
- The application of federal regulations, such as “Buy America” provisions and Davis-Bacon laws also increase project costs. Davis-Bacon alone can increase construction costs by over 35 percent.

Fourth, the federal congress uses its powers to favour some states at the expense of others. Alaska, for example gets over five times the amount it pays in to the federal Highway Trust Fund, while Arizona gets 95 per cent. In general, the north-west states tend to get more than they pay into the fund, while southern states get less.

Fifth, the federal congress often imposes conditions on the use of the funds it appropriates from the federal Highway Trust Fund. For example, it has in the past forced states to impose 55 miles/hour speed limits. More recently, representatives from California objected a local authority’s decision to allow single-occupant vehicles to use high-occupancy lanes on payment of tolls.

In theory, the simplest way to abolish the federal financing of roads would be to stop renewing the 1956 legislation. Then, following a transition period, both the fuel taxes and the congressional powers expire, and the funding of state roads reverts (gets “turned back”) to the states. Many state officials resist this change, possibly because it would force states to incur the odium of raising charges for road use but, for this reason, members of the federal congress should welcome the change.

A less drastic and more politically acceptable reform would be to give states the ability to manage their own highway funding free of federal interference. For example, Senator Coburn, a Member of this Committee, and Representatives Lankford and Flake, have developed legislation, the *State Highway Flexibility Act*, that would effectively and straightforwardly accomplish this goal. Including this measure as part of a surface transportation reauthorization measure would give states the option to manage highway trust fund monies if they believe they can do a better job than the federal government. And it would also enable states to maintain the current funding system overseen by Congress and DOT.

Adoption of this measure would bring some improvement to the current highway financing arrangements, and would not require additional expenditures from general funds.

### **Federal financing by means of an “Infrastructure Bank**

The objectives of the “Infrastructure Bank” proposed in the BUILD bill are attractive, but it is not clear that its financing has to be federal. Why could not private banks put up \$10 billion to achieve the same objectives?

Government financing — which would be subsidized by taxpayers — could well discourage private financing. The offer of cheap finance could lead to slower spending on infrastructure, because potential borrowers would line up for the bank's loans and put their own decisions on hold while waiting for the bank's action. Borrowers are likely to be public institutions that would face criticism from their political supervisors if they do not seek loans at lower rates from the government's infrastructure bank. Once they apply, a government-managed bank would worry about whether its decisions satisfy the politicians: Government rules will invoke "fairness" as a criterion and loans will have to be distributed "properly" among political jurisdictions. The regulations governing the proposed bank already require that 5 percent of the funds be spent in rural areas, and disputes about what is “rural” would be a small foretaste of what could follow.

Those of us who are risk-averse may also be concerned about the proposition that “After the initial years, the American Infrastructure Financing Authority is set up to be a self-sustaining entity”. Was not Amtrak “set up to be a self-financing entity after the initial years”? Why should the Federal Government take risks by investing money it does not even have?

### **Opportunities for private sector involvement in roads**

Private concerns have been contracted to provide public services at least since 1782, when the Perrier brothers were granted a 15-year license to provide water in Paris. Subsequently, private contractors have been providing water to many cities in France and elsewhere<sup>iii</sup>. In many cases the municipalities prepare detailed specifications for the required services, and private companies bid the rate per cubic meter for meeting these specifications. The provision of new roads on such a basis is less common, but can be increased in at least two ways:

- Private providers being paid real tolls;
- Private providers being paid “Shadow” tolls.

### **Private providers being paid real tolls**

Toll roads are provided in France, Spain, Italy and many other countries in areas in which free high-quality long-distance roads do not exist, or do not provide significant competi-

tion. Some of these toll roads are provided by governments, some by private providers. Toll roads are far less common in the USA because of competition from “Freeways” that are “free” at the point of use, such as segments of the 46,726-mile Interstate Highway System.

However, even in the US there are situations where the “Freeways” are congested and where many road users prefer to use less-congested, tolled, alternatives. One such example is a ten-mile stretch of California's State Route 91, some 30 miles east of Los Angeles<sup>iv</sup>. In the 1990s the California Private Transportation Company conceived, financed, designed and provided, tolled lanes in the median of this ten-mile stretch. These tolled lanes can be made available to buses, specific types of high-occupancy vehicles (such as van-pools), and to other vehicles for which tolls are paid. Payments are collected electronically from customers' pre-paid accounts, the payment levels being set to ensure congestion-free travel at all times. Tolls for the 10-mile stretch now vary from \$1.30 for much of the night to \$9.45 at 4:00 PM on Thursday afternoons<sup>v</sup>. All income classes use the tolled lanes, with 10 per cent more women than men switching to them. Those who choose not to pay stay on the non-toll lanes.

The SR-91 express lanes proved popular and have been replicated in the areas of Denver, Houston, Miami, Minneapolis and San Diego. Contracts have been let to add such lanes to the Washington Capital Beltway. Robert Poole and Ted Balaker have dubbed them “Virtual Exclusive Busways<sup>vi</sup>”

These electronically tolled lanes, which can be privately provided, have many advantages:

- They offer buses speedy congestion-free travel;
  - Single-occupant vehicles get premium service and save time;
  - Those who choose not use the express lanes enjoy reduced congestion in other lanes;
- and
- The fees collected can cover the lane costs.

Cities wanting more than tolled lanes could adopt the proposal by Robert Poole and Kenneth Orski for tolled *networks*<sup>vii</sup>: Sets of interconnected premium lanes, to be added to congested freeway systems in urban areas by converting selected lanes to tolled lanes, and using toll revenue bonds to finance the missing links and flyover connectors.

Poole and Orski sketched out such networks for Miami, Atlanta, Dallas/Fort-Worth, Houston, Seattle, DC, San Francisco and Los Angeles. They estimated the costs at \$40 billion, possibly equivalent to \$60 billion today. The networks would be financed by electronically collected tolls, varied to ensure congestion-free travel at all times.

### **Private providers being paid “shadow” tolls**

In the 1980s, government funding for roads was scarce in the UK, and much of the construction industry idled. Private consortia then offered to finance new roads and to be paid by the government an agreed amount for each vehicle-mile using the new road. The principal advantages of this arrangement were:

- Private capital would relieve the pressure on public funds;
- Payment tied to road use would reduce the risk of “roads to nowhere” being financed;
- There would be no tolls to divert traffic to “free” roads; and
- Private involvement would reduce costs.

Eventually, thirty-year concessions for ten highway schemes were offered in the UK in the period 1994-97 under the Thatcher government’s “Private Finance Initiative”. The UK Department of Highways invited bids from consortia to Design-Build-Finance-and-Operate these roads that, after the end of the concession, were to be returned to the government in good condition<sup>viii</sup>. Payments to the successful bidders were based on agreed rates per vehicle-mile, based on traffic counts, the rates being determined by bidding.

The agreement for these Design-Build-Finance-and-Operate projects included a clear division of risks, and two risks in particular were borne by the private concessionaires:

- First, all construction, operating and maintenance costs, and
- Second, all traffic forecast risks.

Total investment on these contracts exceeded £1.5 billion, and financial savings in reduced construction costs were of the order of 20 per cent. Similar contracts were also made in Belgium and Spain.

### **Private provision of highway maintenance**

This is already done in many countries, including the US (In the District of Columbia, Virginia and elsewhere), where governments specify the required end results and private maintenance contractors choose the means of achieving these results<sup>ix</sup>.

### **Improving charging methods for road use**

Dedicated trust funds enabling roads to be financed by taxes on fuel were first introduced, in the UK, by Chancellor of the Exchequer Lloyd George in 1909, and subsequently in the US (in Oregon) in 1919. Although the word “taxes” is used in connection with these surcharges, Sir Edgar Harper, economist and Chief Valuer to the Inland Revenue (the UK equivalent of the US Internal Revenue Service), pointed out that a dedicated road fund

“is not fed by taxation in the strict sense of that term. It provides machinery by which the owners of motor vehicles, in combination and under State guidance, are enabled to expend money on roads for their mutual benefit<sup>x</sup>”

Surcharges on fuel are used to pay for roads because of their convenience and low collection costs. But this method has its disadvantages, a major one being that economies in fuel use reduce the revenues for road improvement. The US Congress responded to this challenge by establishing the *National Surface Transportation Infrastructure Financing Commission* to explore the issue. Its report was published in February 2009 under the title "Paying our Way: A New Framework for Transportation Finance"<sup>xi</sup>. One of the key recommendations was for

**“the transition to a new, more direct user charge system as soon as possible and commit to deploying a comprehensive system by 2020. Because of the complexity inherent in transitioning to a new revenue system and the urgency of the need, the Commission recommends that Congress embark immediately on an aggressive research, development, and demonstration (RD&D) program ...**

**Establish VMT [Vehicle-Miles Travelled] technology standards and require original equipment vehicle manufacturers to install standardized technology by a date certain that will accommodate the desired 2020 comprehensive implementation. Any technology deployed should be designed to accommodate the full range of potential charge systems in anticipation of the potential for state, local, and private toll roads to piggy-back on the national system. These state, local, or private systems should be required to be interoperable with the national VMT standard. Ideally such systems also should incorporate in-vehicle or after-market Global Positioning System (GPS) devices.**

This recommendation by an expert commission can encourage states and local authorities to explore the technical and administrative possibilities of such charges. Because considerable work on VMT charging has already been done in Europe, including the establishment of ISO (International Organization for Standardization) standards to cover members of the European Union<sup>xii</sup>, research in the US need not start from blank sheets. On the contrary, the ISO standards recommended for Europe, which include strong privacy protections, could be taken as starting points.

Such charging systems have not yet been applied to US roads, except during successful pilot tests in Oregon<sup>xiii</sup> and Puget Sound<sup>xiv</sup>. What can be done to develop such improved charging systems for roads?

One way to introduce these new methods would be on a voluntary basis, i.e. to allow VMT-based charging to be used by those who choose to do so. This would require the



new systems to incorporate features attractive to road users, for example access to convenient street parking; to Pay-As-You-Drive insurance (attractive to low-mileage drivers)<sup>xv</sup>; and even to behavioural rewards and discounts<sup>xvi</sup>. Such voluntary systems would allow equipment manufacturers to try out new products, and even allow billing companies (such as those serving telephone and credit card providers) to apply their experience to bill for road use.

VMT-based charging systems for road use have the potential not only to stabilize — and even increase — revenues for road improvement. They might also enable road-use charges to vary from road to road and by time of day. This sort of flexibility, which already exists for other public services such as telecommunications, could enable roads to be provided commercially, without the need for any government financing. To illustrate the possibilities, one such system — and there could be many others — is sketched out below.

### **How a commercialized road system, with GPS-based charging, could work**

The following framework is based on the current operation of mobile phones. The technology, which was described in greater detail in a paper presented two years ago to the 2009 Annual Meeting of the Transportation Research Board<sup>xvii</sup>, has not been tested on a large scale in the US. But over 900,000 vehicles have been operating it successfully in Germany and Slovakia since 2005 and 2010 respectively.

*Every road segment would have a clear and accessible owner.* Road owners would be responsible for the upkeep of their roads and receive all payments made for their use.

*Every vehicle would carry an “In-Vehicle Unit” (IVU) to record details of the vehicle’s travel on different road segments, including details of location and time.* The IVU could be built into vehicles, or be a separate electronic unit. The IVU would download information obtained by means of the Global Positioning System (GPS) system. The downloaded information would belong to the vehicle’s owner who could keep or destroy it. Precise travel information may be needed by vehicle owners for commercial applications (such as fleet management), and to enable charges to be challenged, but there would be no need to send trip information to billing locations.

*Totals of distances travelled — but not details of individual trips — would be sent to a billing agency selected by the vehicle owner.* The billers would debit the accounts of vehicle owners and credit the accounts of road providers, as is done with the billing of telephone calls today. All specifications for this kind of billing require that information about individual trips not be revealed, except to vehicle owners.

*Privacy would have to be guaranteed.* A frequent objection to GPS-based road-use metering is that GPS-based systems allow vehicles to be “tracked”. This is fiction. The satellites making up the GPS enable road users to pinpoint *their own* locations, in the way that sextants were used at sea to enable ships to ascertain their whereabouts. But the sextants did not enable the ships to be “tracked”, and neither does GPS enable road users to be followed. If a vehicle equipped with a GPS navigation system is lost, the navigation system on its own does not enable it to be found. For this, an additional unit has to be fixed to the vehicle, to broadcast its position.

*Payments could be made in the manner of paying for mobile phone use today:* Either by pre-payment or in arrears. The task of collecting payments from road users and distributing revenues to road providers would require expertise in handling large quantities of data, and could be undertaken by companies currently handling phone or credit card billing. More than one company should be involved, with road users being given the choice of selecting those to their liking. Entities currently engaged in high-volume billing (e.g. for telephone use) could profitably also bill for road use.

*Travel on local roads:* Use of all roads would have to be covered by the charging system, otherwise road users could be tempted to use local roads to avoid payment. However, to avoid double charging, provision could be made for exempting from road use-charges travel on local roads paid for by owners’ property taxes. GPS-based charging systems can be programmed to exempt such local roads from charges.

*Provision of new roads:* New roads, or major improvements, would be privately provided where justified by the prospect of private profit.

*Determination of road use charges.* In a competitive road market, competitive road owners would determine charges. Where competition among road owners is not practicable, concessions could be awarded to competing road providers on the basis of bidding processes. For a transition period, provision could be made for charges to be regulated.

*Enforcement.* Mobile inspectors could ensure that vehicles using the new charging systems carry the right electronic equipment and that it was working properly. The use of cameras on fixed gantries could be minimized.

*In summary:* Existing technologies can enable vehicle travel information to be downloaded to vehicle owners, who can send summaries to billers who, in their turn, can simultaneously debit the accounts of road users and credit the accounts of the appropriate road providers, all without invading the privacy of road users. Payments could be made

directly to road providers (in the public or private sectors) with no need to send them to the federal government.

### Conclusion

It may be concluded that the federal financing of state roads, other than by means of the existing federal Highway Trust Fund, is unnecessary now, and is likely to become even less necessary with the development of modern charging methods that, like E-ZPass systems, enable payment for road use to be made directly from road users to road providers. The federal government should, therefore not fund highway infrastructure, nor other transportation infrastructure that can be commercially provided to those wishing to pay the full costs.

### References

---

<sup>i</sup> Roth, Gabriel. “Liberating the Roads: Reforming US Highway Policy”. Policy Analysis No. 538, Cato Institute, Washington DC, 2005.

[http://www.cato.org/pub\\_display.php?pub\\_id=3701](http://www.cato.org/pub_display.php?pub_id=3701)

<sup>ii</sup> Utt, Ronald. “Federal Highway Trust Fund: Recommit to Better Highways and Enhanced Mobility”. WEBMEMO #2944, Heritage Foundation, Washington DC, June 30, 2010. <http://heritage.org/Research/Reports/2010/06/Federal-Highway-Trust-Fund-Recommit-to-Better-Highways-and-Enhanced-Mobility>

<sup>iii</sup> Roth, Gabriel. “The Private Provision of Public Services in Developing Countries”, pp. 251-260, Oxford University Press (New York) for the World Bank, March 1987.

<sup>iv</sup> Sullivan, Edward C., HOT Lanes in Southern California. Chapter 9, pp. 189—223, in (Ed. Gabriel Roth) *Street Smart — Competition, Entrepreneurship and the Future of Roads*, Transaction Publishers, New Brunswick, New Jersey, 2006.

<sup>v</sup> <http://www.91expresslanes.com/schedules.asp>

<sup>vi</sup> Poole, R.W. Jr., and Ted Balaker “Virtual Exclusive Busways”, Policy Study 337, Reason Foundation, Los Angeles, September 2005.

<sup>vii</sup> Poole, Robert Jr., and Orski, C Kenneth. “HOT Networks: A New Plan for Congestion relief and Better Transit”, *Policy Study* No. 305, Reason Foundation, Los Angeles, 2003.

<sup>viii</sup> Roden, Neil, “Development of Highway Concessions on Trunk Roads in the United Kingdom” Chapter 17, pp. 399-421, in (Ed. Gabriel Roth) *Street Smart — Competition, Entrepreneurship and the Future of Roads*, Transaction Publishers, New Brunswick, New Jersey, 2006.

---

<sup>ix</sup>Zietlow, Gunter J., “Role of the Private Sector in Managing and Maintaining Roads.” Chapter 15, pp. 347-371, in (Ed. Gabriel Roth) *Street Smart — Competition, Entrepreneurship and the Future of Roads*, Transaction Publishers, New Brunswick, New Jersey, 2006.

<sup>x</sup> Letter published in *The Times* newspaper, February 5, 1926.

<sup>xi</sup> See <http://financecommission.dot.gov>

<sup>xii</sup> ISO 17575, Parts 1 and 2 (2009), Parts 3 and 4 (2010)

<sup>xiii</sup>Whitty, James M. *Oregon’s Mileage Fee Concept and Road User Fee Pilot Program*. Final Report, Oregon Department of Transportation, November 2007.

<http://www.oregon.gov/ODOT/HWY/OIPP/rufft.shtml>

<sup>xiv</sup> Puget Sound Regional Council. *Traffic Choices Study – Summary Report*. April. 2008. <http://www.psrc.org/projects/trafficchoices/reports.htm>

<sup>xv</sup>Grush, Bern. “What would Steve Jobs do?”, *Tollways*, Fall 2010, pp. 6-15, International Bridge, Tunnel and Turnpike Association, Washington DC.

<sup>xvi</sup> Kalmanje, S. and K. Kockelman. “Credit-Based Congestion Pricing: Travel, Land Value and Welfare Impacts.” In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1864, pp. 45—53. Transportation Research Board, Washington DC, 2004.

<sup>xvii</sup> Grush, Bern, and Gabriel Roth, “Paying for Roads in the 21<sup>st</sup> Century with TPD Pricing”. Paper 09-0222 presented at the 2009 Annual Meeting of the Transportation Research Board. Transportation Research Board, Washington DC, 2009.