

Toll-Financed Interstate Reconstruction and Modernization

by

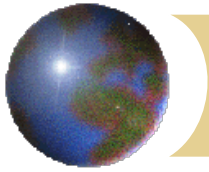
Robert W. Poole, Jr.

Director of Transportation Policy

Reason Foundation

<http://reason.org/transportation>

bob.poole@reason.org



Overview

- ✚ Context: why the conventional wisdom won't solve the problem
- ✚ Economic feasibility of toll-financed Interstate replacement
- ✚ How to address concerns and make this politically feasible



Context: why consider toll-financed modernization?

- ✦ Increasing fuel taxes is very difficult politically, especially at federal level.
- ✦ Achievable increases will be spread over all existing programs.
- ✦ Fuel taxes are also a declining revenue source.



Where does federal money go now?

Highway Trust Fund, FY 2013

⊕ FHWA	\$40.968B	81%
⊕ FTA	8.478	17%
⊕ NHTSA	.670	1%
⊕ FMCSA	.561	1%
Total:	\$50.677B	100%

Source: GAO-15-33, October 2014



How much actually goes for roads and bridges? (1)

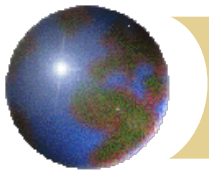
Roads	\$18.340B	47%
Bridges	6.700	17%
Safety improvements	2.580	7%
Enhancements	.850	2%
Project delivery	7.760	20%
Other	2.660	7%
TOTAL	\$38.890B	100%



How much actually goes for roads and bridges (2)

- ✦ Previous slide, actual roads+bridges spending = \$25.04B
- ✦ That is just 49% of the \$50.677B total
- ✦ That \$25 billion is spread over the entire federal-aid highway system.

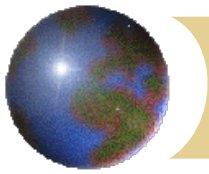
But, how much gets spent on major projects (Interstates + NHS)?



Major projects spending

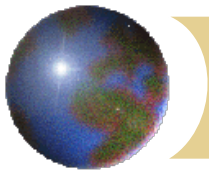
<i>Reconstruction</i>	<i>\$1.590B</i>
<i>Resurface/rehab.</i>	<i>1.189</i>
<i>New construction</i>	<i>.261</i>
Project develop.	.883
Safety improve.	.328
Enhancements	.070
Other	.278
Total:	\$4.599B

Source: GAO-15-33, October 2014



Just 6% goes for major projects

- ❖ Out of entire \$50.7B FHWA budget, only \$3.04B goes for major highway and bridge projects, per previous slide.
- ❖ Yet if we expand the current federal program by 10-15%, every current program will be increased, since each has a vocal constituency.
- ❖ This is no way to fund a trillion-dollar Interstate replacement program.



What are America's two greatest highway investment needs?

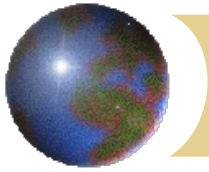
- ✦ Rebuilding and widening the Interstate highway system nationwide, as it wears out. Cost: about *\$1 trillion*.
- ✦ Reducing chronic freeway congestion. Direct cost to highway users: about *\$160 billion* per year.

There is no serious federal program for either of these.



Tolling is a powerful tool for both:

- ✚ Can mobilize large sums of money up-front to finance major highway projects.
- ✚ Can reduce traffic congestion sustainably (if used as a variable price).



Two major funding priorities:

- ❖ Replace the obsolescing Interstate system with a 2nd-generation system, including dedicated truck lanes.
- ❖ Add networks of Express Toll Lanes in the 15 largest metro areas, for serious congestion relief.

Both could be toll-financed and procured as long-term P3 concessions.



Purpose of Interstate 2.0 study:*

- ✚ Estimate cost of reconstructing entire Interstate system;
- ✚ Estimate cost of needed lane additions, including truck-only lanes;
- ✚ Assess the feasibility of financing this project via all-electronic tolling (AET)
- ✚ Address political feasibility.

*Poole, "Modernizing the Interstate Highway System via Toll Finance,"
TRB Paper No. 14-0716



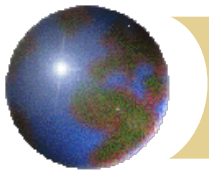
Methodology

- ⊕ Use state-specific FHWA HERS unit cost data;
- ⊕ Estimate costs state by state, for reconstruction and widening;
- ⊕ Use FAF data for truck-lanes analysis;
- ⊕ Use same toll rates everywhere as baseline, CPI-adjusted;
- ⊕ Use moderate congestion pricing for urban Interstates;
- ⊕ Basic feasibility: NPV revenue/NPV cost.



Toll revenues

- ✦ For each state, rural and urban separately
- ✦ VMT growth rate estimates for each state, for cars and for trucks (Volpe Center)
- ✦ 30-year VMT and revenue, for each state.
- ✦ Rural: 3.5¢/mi cars, 14¢/mi trucks; CPI-adjusted
- ✦ Urban: moderate peak/off-peak tolls, for each of four urban size categories
- ✦ Net revenue=85% of gross (10% for O&M, 5% for AET collection costs)



Urban congestion pricing

⊕ Toll rates for cars:

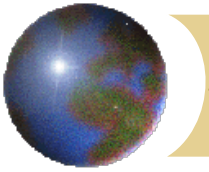
⊞ Small urban: 5¢ peak, 3.5¢ off-peak

⊞ Med. urban: 6¢ peak, 4.5¢ off-peak

⊞ Large urban: 7.5¢ peak, 5.5¢ off-peak

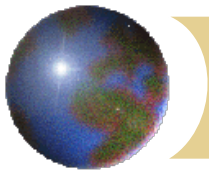
⊞ V. large urban: 10.0¢ peak, 7.0¢ off-peak

⊕ Truck toll rates: 4X car rates



Results of reconstruction analysis

- ✚ NPV of net revenue exceeds NPV of reconstruction cost in most states.
- ✚ But—some of that revenue was based on VMT beyond what specific corridors can handle at current size.
- ✚ Hence, next step assessed widening needs.



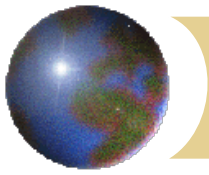
Widening methodology

- ⊕ Analyzed each Interstate in each state.
- ⊕ FHWA provided data on rt-mi and In-mi for each route, by state.
- ⊕ Used VMT projections to estimate DVMT/In-mi for each: 2010, 2020, 2030, 2040.
- ⊕ Used LOS C as standard for rural: **96 routes** need lane additions.
- ⊕ Used LOS D for urban: **97 need** lane additions.



Truck-only lanes

- ✦ Separate data set from FAF on truck volumes, by Interstate route, by state.
- ✦ Truck VMT for 2007 and 2040, based on FAF modeling.
- ✦ Computed 2040 truck DVMT/In-mi for all long-distance corridors, compared with our previous (non-FAF) 2040 projection.
- ✦ Result: **29 corridors** with 40% or more truck traffic in 2040—some exceeding 100%.
- ✦ Overall widening cost about \$500B.



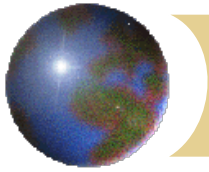
Overall results

- ⊕ NPV of cost = **\$983 billion**.
- ⊕ NPV of revenue = 99% of NPV cost.
- ⊕ 30 states positive with basic toll rates, of which 9 could do it with lower rates.
- ⊕ 9 states need slightly higher rates
- ⊕ 6 urban states need even higher rates.
- ⊕ Only 6 rural states are not really toll-feasible.



Four major implications

- ❖ Compared with 50 years ago, a very positive result.
- ❖ Large majority of states could do this on their own.
- ❖ Big constraint is federal ban on tolling “existing” lanes—but these lanes *won't be there* unless reconstructed.
- ❖ Could be the first major shift from fuel taxes to *mileage-based user fees*.



Political feasibility issues:

- ✚ Tolls are seen as “taxes.”
- ✚ Tolls are diverted to other uses (e.g., Pennsylvania Turnpike).
- ✚ Truckers oppose “double taxation.”
- ✚ Interstate toll reconstruction pilot program has not been used.
- ✚ Cost of toll collection eats up revenues.
- ✚ MBUFs seen as privacy threat.

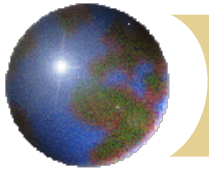


*Value-Added Tolling principles**

- ✦ Provide better service (LOS) than today.
- ✦ Begin tolling a corridor only *after* it is modernized.
- ✦ Use toll revenues *only* for Interstate modernization (true user fee).
- ✦ Tolls would *replace* fuel taxes on tolled corridors (via fuel tax rebates)

AAA national board has endorsed these principles (Dec. 2015)

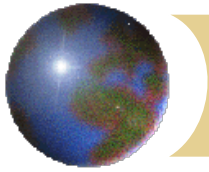
*Poole, "Value-Added Tolling: A Better Deal for America's Highway Users," Reason Foundation, 2014



All-electronic tolling (AET) basics

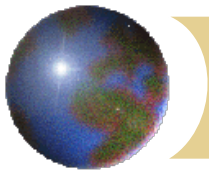
- ✦ Cost of AET collection can be as low as 5% of revenues (2012 Fleming paper)*.
- ✦ AET technology (transponders and license-plate verification) is widely accepted.
- ✦ AET facilitates variable pricing where it is most needed (urban freeways).

*Daryl Fleming, et al., "Dispelling the Myths: Toll and Fuel Tax Collection Costs in the 21st Century," Reason Foundation, 2012



What does trucking industry want?

- ✦ Safety benefits from dedicated truck lanes
- ✦ Longer, heavier rigs for increased productivity, energy savings (LCVs)
- ✦ Safe overnight parking
- ✦ Corridor suitable for automated trucks and/or truck platooning.

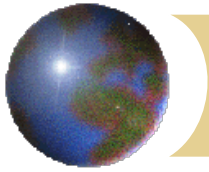


Trucking's tolling concerns:*

- ⊕ Single transponder nationwide
- ⊕ Single monthly toll invoice
- ⊕ Confidential routing/billing info.

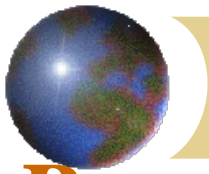
All three features already being provided by Bestpass and PrePass Plus, both ATA-approved vendors.

*Poole, "Renewing Trucking's Infrastructure for the 21st Century," TRB Paper No. 16-1353



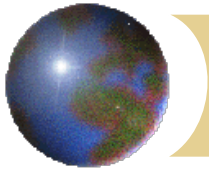
Reasonable truck toll rates

- ❖ Interstate 2.0's 14¢/mi. is far less than eastern toll roads (which divert revenue).
- ❖ Rebate of state diesel tax would further reduce cost.
- ❖ State would still come out ahead, since per-mile toll charge exceeds per-mile yield of fuel tax.



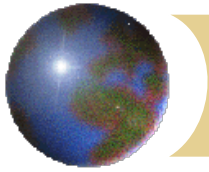
Benefits of all states having permission for toll-financed Interstate replacement

- ⊕ Pilot program forces states to single out one Interstate for toll-based reconstruction
- ⊕ Broader program would let each state develop 20-year plan to rebuild all its Interstates.
- ⊕ Letting only 3 states do this prevents more innovative states from trying.
- ⊕ A 50-state program increases odds of a pathfinder state achieving political consensus.
- ⊕ Demonstration effect can be powerful (e.g., SR 91 Express Lanes)



Conclusions

- ❖ Interstate replacement is mostly toll-feasible.
- ❖ Value-added tolling could be key to political feasibility.
- ❖ AET would jump-start the transition to mileage-based user fees.
- ❖ First step: federal permission for all states (mainstream the pilot program).



Questions?

Contact information:

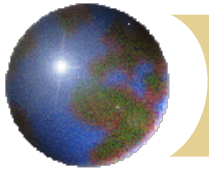
<http://reason.org/transportation>

Bob.poole@reason.org



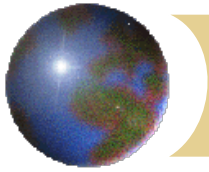
Lower-cost, lower-toll states

- ✦ AL, AR, IL, LA, MS, OK, SC, TN, UT
- ✦ Could do it with less than baseline rates of 3.5¢/mi car and 14¢/mi truck.
- ✦ Estimated range:
 - ▣ Cars 2.1 - 2.7¢/mi
 - ▣ Trucks 8.3 - 11.2¢/mi



Higher cost, higher-toll states

- ✦ CA, DC, MA, NJ, NY, WA
- ✦ Range for cars: 5.2 - 7.7¢/mi
- ✦ Range for trucks: 21 - 31¢/mi
- ✦ Compare current rates in Illinois:
 - ▣ Cars: 2.2 - 6.2¢/mi
 - ▣ Trucks: 22 - 49¢/mi



Difficult rural states

- ✦ Low traffic and costly, mountainous terrain
- ✦ AK, MT, ND, SD, VT, WY
- ✦ Except for Alaska:
 - ▣ Cars: 5.5 - 9.8¢/mi
 - ▣ Trucks: 22 - 39¢/mi
- ✦ Alaska not toll feasible (only 24% of costs covered)