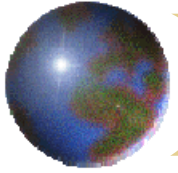


VMT Charges and their Implications for Toll Roads

Robert W. Poole, Jr.

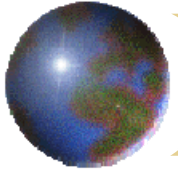
Director of Transportation Policy

Reason Foundation



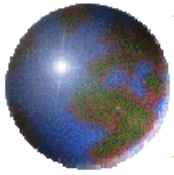
Overview of presentation

- ✚ Why the interest in VMT charging?
- ✚ Technology alternatives
- ✚ Transition from fuel tax to VMT charge
- ✚ Policy issues to be resolved
- ✚ Implications for toll roads

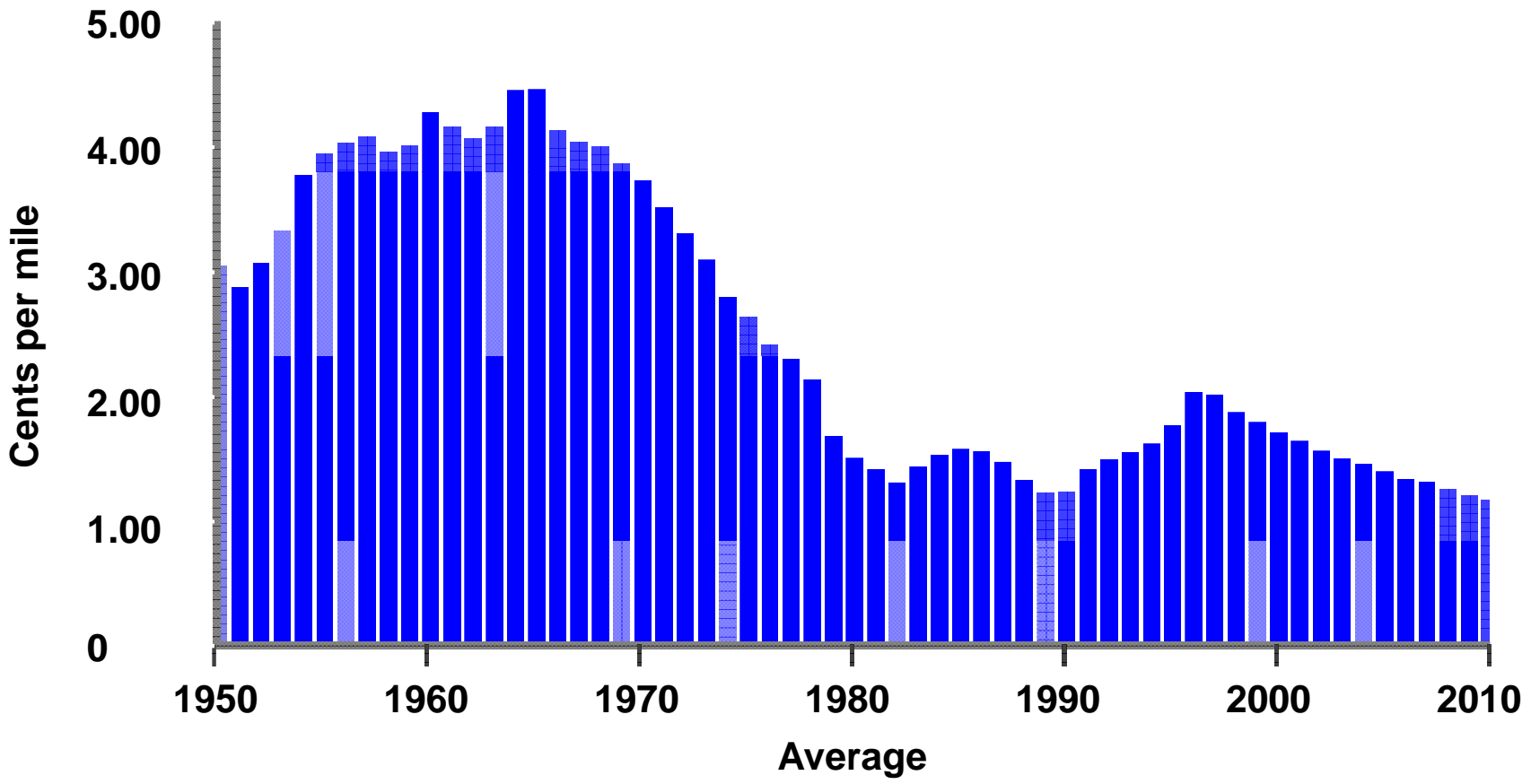


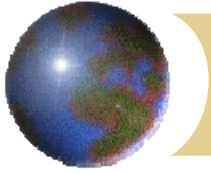
The fuel tax is nearly out of gas

- Two major expert studies:
 - TRB fuel tax committee (2006)
 - Infrastructure Financing Commission (2009)
- Principal findings:
 - Increasing fuel economy (CAFE standards)
 - Alternative propulsion technologies
 - Energy policy (“oil independence”)
 - Best replacement is charge per VMT



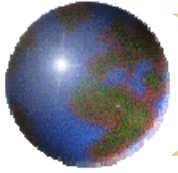
Decline in real value of CA fuel tax (\$1997)





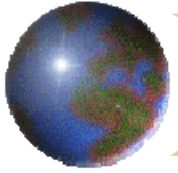
Why is VMT the preferred basis for charging?

- Fairness—much like a toll.
- Directly proportional to road use (assuming separate rate for trucks).
- Will grow along with VMT, as economy and population grow.
- Could restore the original users-pay/users-benefit principle on which fuel taxes used to be based.



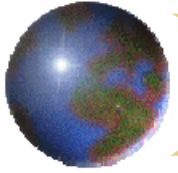
What are the technology alternatives?

- Annual odometer readings
- Pay at pump via RFID tag, using estimated VMT
- Use existing data port for speed data, location from cell-towers, text-messaging
- Transponders plus gantries everywhere
- GPS unit in vehicle + some form of downloading, enforcement gantries



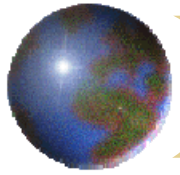
VMT estimated at the pump

- Suggested in RAND and TRB studies as interim/first step
- Mandatory RFID tag with VIN
- VIN gives make/model information; hence typical MPG
- Fuel purchased + MPG yields VMT estimate
- VMT charge could be alternative to gas tax, at pump.



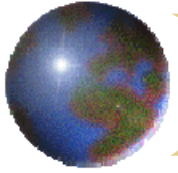
Onboard speed data/cell towers

- ✚ Proposed by Max Donath at U. of Minn. and endorsed by RAND study.
- ✚ Box plugs into OBD-2 data port for speed data (on all cars since 1996).
- ✚ Location derived from cell towers.
- ✚ VMT data transmitted via SMS to billing center.



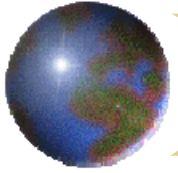
Transponders plus gantries everywhere

- Sticker tags becoming very affordable; could be required.
- Existing gantries/cameras for toll roads.
- New gantries every 10 miles on rural Interstates and arterials.
- New gantries every mile on urban Interstates and arterials.
- May be less costly than GPS-based system.



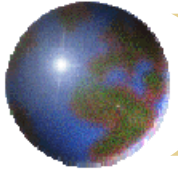
GPS in every vehicle

- GPS on-board unit (OBU) akin to those for German truck tolling.
- SMS for communicating with billing centers.
- Either road-specific VMT or computed charge information is transmitted.
- Still need roadside equipment for enforcement purposes (as in Germany).
- Likely the most costly alternative.



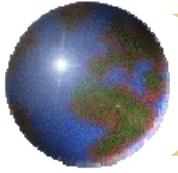
How do we transition from fuel taxes to VMT charges?

- OEM vs. after-market devices:
 - Fleet turnover problem with new vehicles
 - Hacking/disconnection problem with after-market
- Oregon's dual system pilot: download GPS data at the pump.
- Skymeter-type voluntary, competitive approach (after-market).



The privacy controversy

- Widespread belief that GPS “tracks” vehicles in real time.
- Privacy depends on what data are *transmitted*—and where billing takes place (on-vehicle or off-vehicle).
- Trade-off between privacy and ability to audit (as with phone bill).
- For road tolling and congestion pricing, you need road-specific location information.



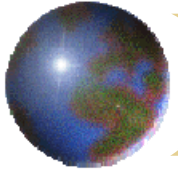
VMT charge vs. VMT tax

⚙ VMT charge:

- ▣ Per mile, type of road, time of day, vehicle class.
- ▣ Basically a 21st-century toll.
- ▣ Purpose: to fund highways adequately.

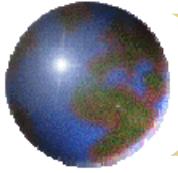
⚙ VMT tax:

- ▣ Per mile, time of day, fuel used, # passengers, GHG emissions, etc.
- ▣ Purpose: to incentivize shift to greener cars, drive less, fund alternative modes.



Implications for toll roads

- If VMT *charge*, toll roads are exemplars:
 - Basic rate (all roads) plus road-specific toll
 - Restores users-pay/users-benefit principle
 - Would permit lower-cost technology for basic rate
- If VMT *tax*, toll roads lose control of charging:
 - Become tax collectors for social engineering
 - Fund competing modes
 - Face reduced VMT growth, putting debt-service coverage at risk.



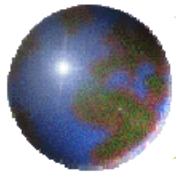
An alternative to consider:

Given:

- The privacy issue
- The transition issue
- The behavior/social policy issue

Maybe we should aim for a hybrid system:

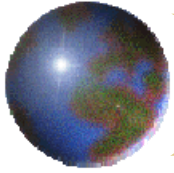
- Transponder-based VMT charge for all limited-access roads (all become toll roads)
- Property taxes for local streets and roads
- Retain some fuel tax as energy/GHG tax
- Problem: how to fund rural roads?



Questions?

Bob.poole@reason.org

<http://reason.org/transportation>



Further Reading

- *A New Approach to Assessing Road User Charges*, Forkenbrock & Kuhl, University of Iowa, 2002.
- *The Fuel Tax and Alternatives for Transportation Funding*, TRB Special Report 285, 2006.
- *Paying Our Way: A New Framework for Transportation Finance*, Infrastructure Financing Commission, 2009.
- *Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding*, RAND Corp., NCHRP web-only document 143, 2009.
- *Discerning a Pathway to Implementation of a National Mileage-Based Charging System*, Whitty & Svadlenak, TRB Special Report 299, 2009.
- *Mileage-Based User Fees: Defining a Path Toward Implementation*, Goodin, et al, UTCM #09-39-07, 2009