Symposium on Mileage-Based User Fees: Moving Forward

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Administrative Costs of Road User Charges

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April 21, 2010

Administrative Costs are Key Issue

- Road user charges are perceived to have significant advantages over fuel taxes as financing mechanism
- But high collection costs of user charges are perceived as major weakness
- U.S. DOT asked HDR Decision Economics to investigate road user charge administrative costs

Several Technologies Available

- Video tolling (LPR)
- Automatic Vehicle Identification (AVI)
  - I.e., transponder-based systems like E-Zpass
- GPS

Several Road User Charge Scenarios

- Corridor tolls
- Cordon tolls
- Nationwide (or area-wide) user charges

Corridor Tolls

- For 10-mile corridor
  - GPS is cheapest
    - Costs about 4-5% of revenues
  - AVI is next
    - Costs about 16-25% of revenues
  - Video tolling is most expensive
    - Costs about 33-50% of revenues

Corridor Tolls

- For 1,000-mile corridor
  - GPS and AVI are tied
    - Costs about 2-3% of revenues
  - Video tolling is most expensive
    - Costs about 3-5% of revenues
  - Shows strong economies of scale
  - Costs vary depending on
    - Number of exists (hence toll reader points)
    - Hard tag vs. sticker tag
    - “Thick” OBU vs. “thin” OBU

Cordon Pricing

- Not expressed as percent of revenues
- AVI and GPS are tied
  - About $2.1 million/year for 10 entry/exit points
- Video tolling more expensive
  - About $4 million/year
- Contrary to Stockholm's experience

National User-Charge System

- Fuel tax costs are about 1% of revenues
- Video and AVI are impractical on national scale
  - Limited national deployment would cost
    - 26-51% of revenues if readers every 2 miles
    - 3-5% of revenues if readers every 20 miles
    - 1-2% of revenues if readers every 50 miles
  - Less frequent readers save costs
    - But pose risks of greater evasion

National User-Charge System

- GPS tolling
- Depends critically on costs of OBU
  - "Thick" vs. "thin" OBU
  - Thick OBU costs more ($650)
    - Less privacy concerns
    - More complex to update mapping software
  - Thin OBU costs less ($195)
    - More privacy concerns
    - Mapping software off-loaded to host computer
    - Higher data transmission costs

National User-Charge System

- Transaction costs are very low
  - 0.07% of revenues
- Capital costs would be 1-4% of revenues
- Including costs of OBUs, total costs would be
  - 7.9% of revenues (thin OBU)
  - 33.2% of revenues (thick OBU)

Conclusions

- GPS is only feasible technology for national user-charge system
- Administrative costs are feasible if thin OBU is used
- But still significantly higher than fuel tax
- Collection costs could only be justified if significant benefits other than just collecting revenue
  - E.g., congestion pricing
  - Targeted emission fees
  - Different rates for roads of different load-bearing capacity
  - Better traffic data

Issues

- GPS has imperfect locational accuracy
  - Especially in cities
  - For closely parallel roads (e.g., interstates and service roads)
  - GPS accuracy will improve as new GPS signals become available
- OBU is key cost item
  - OBU costs could be greatly reduced if built into car at factory
  - Thin OBUs are much cheaper
    - But could raise more privacy concerns