National Evaluation of a Mileage-Based Road User Charge

Public Policy Center
University of Iowa
Policy issues being addressed

- Fair and stable revenue source
- Price road use to reflect actual costs
Origins of the current study

- 3-year study ended in 2002
- Funded by the FHWA and 15 state DOTS
- Developed conceptual framework for a mileage-based road use charge
Basic Approach

- Area-wide pricing based on miles traveled within jurisdictions
Participants

- Six Locations

- Two-year field test with 240 participants per year per site
- Total 2,880 participants
Participant Profile

- Demographics
  - Age
  - Gender
  - Education Level

- Attitudes
  - Confidence in government
  - Importance of personal privacy
  - Level of road finance

- Driving Behavior
  - Annual miles driven
  - Commute length
  - Vehicle Type
System Overview

Vehicle on-board computer

Wireless data transmission
Cellular modem (Sprint 1xRTT ~50bps)

Network operation center

Billing & dispersal center
Vehicle on-board computer

Input:
- GIS database
- GPS location
- Odometer feed
- Rate tables
- Fuel level feed

Output 1:
- Miles driven in jurisdiction

Output 2:
- User charge
- Fuel tax credit
- Vehicle Id

OBC Calculations:
- Miles driven in jurisdiction
- Mileage charge in jurisdiction
- Credit for fuel tax paid at pump
Network operation center

Vehicle\textsubscript{j} Input 1
- Miles driven in jurisdiction\textsubscript{i}

Vehicle\textsubscript{j} Input 2
- User charge
- Fuel tax credit
- Vehicle Id

NOC functions
- Manages all wireless communication

Master
- GIS database
- Rate tables

GIS & Rate Updates

Output to Vehicle\textsubscript{j}
- Miles driven in jurisdiction\textsubscript{i}
- User charge
- Fuel tax credit
- Vehicle Id

Billing Output
Billing and disbursal center

Billing Input:
- Miles driven in jurisdiction_i
- User charge
- Fuel tax credit
- Vehicle Id

BDC Functions:
- Totals receipts for jurisdiction_i
- Invoicing:
  - Match vehicle Id to owner data
  - Produce invoice

Output to jurisdiction_i:
- Total receipts

Output to Owner_j:
- Invoice

Owner_j:
- Payment
Questions being addressed

- Appropriateness of the technology
  - Cost-effective, reliable, user friendly, flexible, and secure

- User Acceptability
  - Maximize convenience
Study Parameters

- Mileage rates
  - Revenue neutral with current fuel tax
    - Varying based on fuel efficiency
      - 10 vehicle classes based on EPA
Study Parameters

- Data upload method
  - Wireless transfer
    - No user involvement
  - Smart card transfer
    - User manual initiates transfer using a card reader
Study Parameters

- Data transfer frequency

  - Frequency of wireless transfer
    - Vehicle initiated (data push)
    - NOC initiated (data pull)
Study Parameters

- System updates
  - Penetration time for rate table and jurisdiction boundary updates
    - Time versus degree of penetration
Study Parameters

- Level of in-vehicle information
  - In-vehicle text display
    - Amount and duration of information presented to driver
Study Parameters

- Level of detail on invoice
  - Maximum personal privacy
    - Only total charge and total mileage
    - Minimum audit-ability
  - Minimum personal privacy
    - Charge and mileage by trip (engine start/stop)
    - Minimum personal privacy
Where are we now?

- **Five months into study**
  - Technology team
    - Finalizing the selection of vendors
      - On-board computer and communications
      - Study data server and billing center
  - Participant team
    - Identified study area and participant screening criteria
    - Evaluating responses to our RFP for recruitment firms