

Symposium on Mileage-Based User Fees

Implementation Challenges

Ben Pierce

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Implementation Challenges

Challenges No Technology Will Overcome

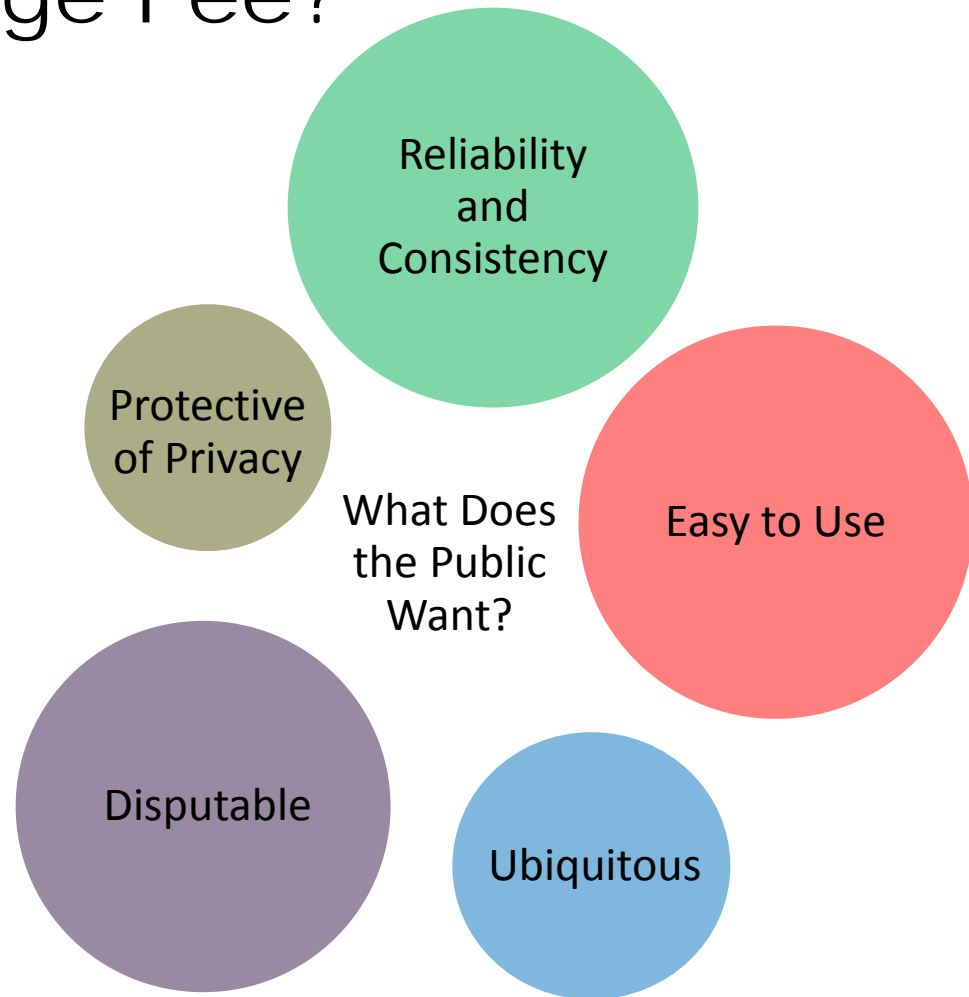
- Political willpower to implement a new tax or fee
- Lack of a clear goal/objective for implementation
- Lack of perceived need by public
- Institutional barriers/authority
- Operational costs that will be in excess of the costs for collecting the fuel tax
- Requirement for gradual phase-in or accommodation of existing vehicle fleets
- Cheating

Challenges Suitable for Technology Alleviation

- Ease of enforcement/evasion
- Data security/integrity
- Assessment accuracy, reliability, and consistency
- Technology interoperability
- Privacy protection
- Equity in assessments
- System flexibility
- Installation and operational costs
- Ease of use
- Ability to dispute charges/audit

What does the traveling public want of a Road Usage Fee?

- They want the system to be:
 - Reliable and Consistent
 - Protective of privacy (secure)
 - Easy to use
 - Disputable (in terms of charges)
 - Ubiquitous (work the same everywhere)



Reliability and Consistency

Reliability

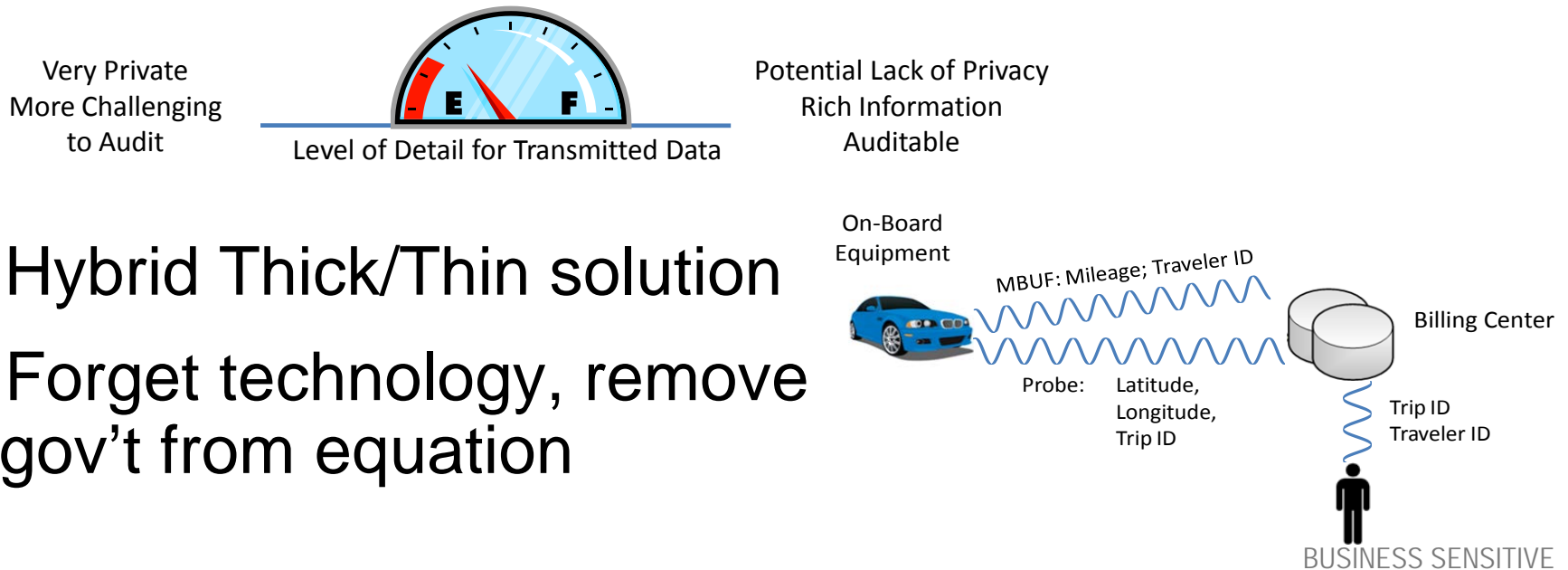
- It always “works”
 - Odometer mileage
 - Can be tampered electronically, hard to catch
 - OBD-II mileage calculated as integrated over time
 - OBD-II devices usually removable
 - GPS
 - Can be readily jammed
 - Can vary in accuracy significantly
- **There is no one technology that will always work.**

Consistency

- The same trip yields the same fee assessment
 - Boundary crossing less variable than other assessment methods
 - Dwell time and engine run time more variable than mileage in congested situations
 - GPS reception can vary significantly by time-of-day, season, weather, etc.

Mitigating Privacy Concerns

- Utilize a “boundary-crossing” metric instead of mileage
- Eliminate mileage by zones or categories use just total miles
- “Thick” versus “Thin” on-board units

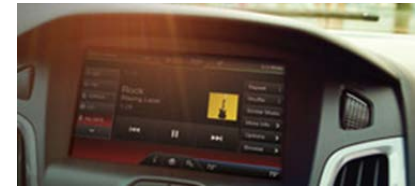


- Hybrid Thick/Thin solution
- Forget technology, remove gov't from equation

Ease of Use

- Integrate MBUF technology into existing technologies

- Toll transponders
- Smart phones
- Embedded infotainment systems
- On-board diagnostic ports
- Odometer



- Change method for fee calculation from miles to...

- Engine run-time
- Boundary crossing events
- Dwell time in a zone

Disputable (Ability to Audit/Verify Fee Assessment)

- Technology must provide mechanism for traveling public to resolve assessment disputes with agency



Red-light traffic camera uses photo evidence for disputes.....but still actively challenged by the travelling public!

- Ensuring auditability is “easy” if you allow for tracking of vehicle
- Use of odometer as “ground truth?”
- More sophisticated obfuscation, believable?

Ubiquitous

- The lesson from tolling –
 - Need for non-proprietary communication protocols
- K.I.S.S.
 - The “simpler” the technology the more likely it will be able to work across geographical locations

Highlights

- Technology can be used to mitigate many implementation challenges, but not all
 - Technology is not the major barrier to implementation
- No one technology can balance or mitigate all challenges
 - Mitigating one challenge will result in unbalancing another
 - We need to decide what are the few key issues to address with technology