Workshop Highlights:

Mass. Integrated Transportation Payments Security and Privacy

http://www.ecs.umass.edu/umass_itps_workshop/

UMass President's Science & Technology Initiative
UMass Amherst + UMass Dartmouth

Organizers:

- Prof. Wayne Burleson, Electrical Computer Engineering
- Prof. John Collura, Director, UMass Trans. Ctr., Civil & Env. Eng.
- Prof. Kevin Fu, Computer Science
- Dr. Andy Rupp, Electrical Computer Engineering
- Marguerite Zarrillo, Chair, Physics, UMass Dartmouth

What's special about security?

Correctness is easy.

Security is hard.

Photo by Kevin Fu

National Academies on Transit Privacy

April 2008

TRANSIT CO OPERATIVE RESEARCH PROGRAM
Sponsored by the Federal Transit Administration

Subject Areas: IA Planning and Administration;
IC Transportation Law; VI Public Transit

Responsible Senior Program Officer: Gwen Chisholm Smith

Legal Research Digest 25

PRIVACY ISSUES WITH THE USE OF SMART CARDS

This report was prepared under TCRP Project J-5, "Legal Aspects of Transit and Intermodal Transportation Programs," for which the Transportation Research Board is the agency coordinating the research. The report was prepared by Paul Stephen Dempsey, Tomlinson Professor of Law, McGill University, Montreal, Quebec, Canada. James B. McDaniel, TRB Counsel for Legal Research Projects, was the principal investigator and content editor.

"The **fundamental challenge** is to create a **security** regime that is highly effective in preventing…terrorism, but does **not unduly interfere** with the efficiency and productivity of transportation, impose excessive costs, create unwarranted passenger inconvenience, or intrude unnecessarily into **individual privacy and civil liberty**."

Who Spoke?

Massachusetts Bay Transportation Authority	Rail, Subway, Bus & Ferry in the Boston Metro Area
massport	Logan Airport Parking Facilities
Massachusetts Turnpike Authority	Big Dig, Mass. Turnpike, Fastlane
SCHEIDT&BACHMANN	Implementation and Distribution of Fare Collection Systems
ELECTRONIC FRONTIER FOUNDATION	Digital Civil Liberties Advocacy Group
Karsten Kohl	U of Virg. Grad, Security Expert

Breakout: Security Economics

Security Costs:

1. Evolving compliance needs/maintenance costs

2. Media costs (e.g., Charlie card)

3. Service fees (e.g., credit card fees)

4. "Establishing policy" costs

5. Initial buy-in costs (subject to change with technology)

6. Visitors to system costs (easier if same people used system constantly)

7. Legacy media compliance (cash, magstipe)

8. Political costs (change in leaders)

Breakout: Security Economics

Economic/Business Case Considerations:

1. Poorly understood end of life cycle for system

2. Integrated payments across agencies desirable, but no one size fits all solution

3. Credit card fees significant barrier

4. Not every passenger has a credit card

Optimal solution will require cooperation between agencies, credit card companies, and security companies

Breakout: Privacy

Collecting passenger location information
- Important for operations, planning, stats, marketing

Data retention liability
- If you collect it, laws require you keep it
- **Myth**: Data mining incompatible w/ passenger privacy

Solutions:
- Require destruction/purge after use (not just re-ID)
- Laws effective against law-abiding organizations,
  but not against insiders or intruders

Breakout: Privacy

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Passport files of candidates breached

Records of Clinton, McCain, Obama inappropriately accessed, officials say

AP Associated Press
updated 9:44 p.m. ET, Fri., March. 21, 2008

WASHINGTON - State Department employees snooped through the passport files of three presidential candidates — Sens. **Barack Obama**, **Hillary Rodham Clinton** and **John McCain** — and the department's inspector general is investigating.

▶ **Video**

Breakout: Privacy Lessons

- Difficult to know when privacy violated
  - ▶ Latent effects (shows up much later)
  - ▶ Different passengers, different agencies have different privacy requirements

- Need transparency, above reproach
  - ▶ The public appreciates openness

- Borrow from HIPAA medical privacy model
  - ▶ Sophisticated attempt for de-identification
  - ▶ But far from perfect

Breakout: Technology Questions

- Who controls and maintains the payment system?
- Crypto? Biometrics?
- New vulnerabilities?
- NFC phones as payment platform?
- Disposable vs. permanent?

- Increased read range for future contactless cards?
  ‣ Passenger flow can improve
  ‣ Handicapped access
  ‣ Parking
- But fraud and privacy violations could increase
  ‣ Exit accountability, tolls
  ‣ Passengers more susceptible to location tracking

Workshop on Integrated Payment Systems for Transportation

- Multi-disciplinary Team
  - Wayne Burleson (ECE) Director of TRENDS, Embedded Security, RFID
  - John Collura (CEE) Director of UMASS Transportation Center
  - Kevin Fu (Computer Science) Applied Cryptography, RFID
  - Marguerite Zarrillo, UMass Dartmouth, Toll Collection modeling
- Relevant Facilities
  - UMASS Ring Road Test Track (Collura)
  - RFID Lab (Fu and Burleson)
  - Transportation Simulation Laboratory (Zarrillo, UMass Dartmouth)
- Partners
  - Volpe National Transportation Systems Center, Cambridge, MA
  - RSA Labs (EMC security research group) , Bedford, MA
  - Intel Research, Seattle, WA
  - ThingMagic, Cambridge, MA
  - Massachusetts Executive Office of Transportation: Mass Highways, Mass Port, I95 Corridor Coalition.