“Introducing New Information and Telecommunication Technology Applications to Transportation: Opportunities and Challenges
(aka: “smarter, better, faster” (Katie)
(Gene Conti, Sandi, Neil P: best “red meat” session)

Rapporteur Report by Dan Sperling
June 15, 2012
Presentations

• Building the Next Generation Air Transportation System
  – Margaret Jenny, President, RTCA (federal advisory committee)

• Freight Rail Perspective on Challenges and Barriers to Technology Implementation
  – Frank Lonegro, President, CSX Technology

• Internet of Cars
  – Andreas Mai, Director Product Management Smart Connected Vehicles, Cisco

• “Driving 21st-century cars on 20th-century roads with 19th century thinking”
  – Philip Tarnoff, consultant and author (ex-University of Maryland)
“The Overall Picture is Bleak”
(DS: esp in public agencies)

- Highway Agencies (operations, construction, pavements)
- Transit Agencies
- Toll Authorities
- CVO-Government Infrastructure
- CVO-On-board Equip.
- Automotive Telematics

Source: Phil Tarnoff
Transportation: A Global Transformational Opportunity?

Accidents
- 7.9 million accidents
- 7.4 million injured
- 1.3 million fatalities
- $0.6 trillion cost

Congestion
- 90 billion hours delay
- 230 million metric tons of carbon-equivalent
- $1 trillion waste (2% of GDP)

Auto Business Model
- Oversized and underutilized vehicles
- 75% of automotive value add post sale
- 8%-15% gross margins

Road/Traffic System
- “Free” public service
- No/low return on assets
- Underfunded
- Deficient

Source: IRF World Road Statistics 2008, World Bank Global Road Safety Facility, Cisco IBSG Automotive 2011
Transportation Context

• Complex mix of public and private entities
• Slow uptake of incremental technologies by public sector (operations vs vehicles)
• Huge opportunities for “better” transport, but also many barriers to change
• Slow uptake of transformational technologies (NextGen, RRs, autonomous vehicles, new mobility services)
  – System innovation is very slow
  – Public/private divide (incentives, culture, liability, etc)
Unanimous Belief!

Components of Success: Technology is NOT the biggest challenge.

(credit to Margaret Jenny)
WE HAVE MET THE ENEMY AND HE IS US.
Issues and Challenges

• Technology change is NOT technology problem (financial, political, organizational culture)
  – Need non-engineering approaches (sociology, behavioral sciences, equity, public good)
  – Centralized control (turning off cell phones when vehicle in motion)?

• Gov’t culture/expertise
  – need to reward experimentation and risk-taking
  – should mandate outcomes not specific technologies (eg, positive train control)
  – need to demonstrate credibility/reliability, which gives confidence to private sector (NextGen)
  – Competence with new technology

• System change issues
  – Need govt support initially (overcome barriers, overcome network effects (NextGen)
  – Favor early adopters (well equipped planes, autonomous cars)?
  – Where to start (off broadway? NYC vs others?)
  – What should be privatized (or public/private) to accelerate innovation?
  – How much centralized control (eg, NextGen, autonomous vehicles, trains)
  – Interoperability (cars, trains, planes)

• Workforce/training
  – Overcome thinking that “technology is job killer” (RRs, aviation)
  – Interdisciplinary training
  – Recruiting younger generation

• Privacy

• Liability (for new technologies esp those like autonomous vehicles and NextGen with potential for massive failure)
### Many Connected Vehicle Profit Pools – Albeit Largely Disconnected, So Far...

#### Car Manufacturers
- Navigation
  - TomTom
  - GARMIN
  - NAVTEQ
- POI / LBS
- Social Media
  - myspace
  - twitter
  - facebook
- X-Mode
- Assist

#### Finance
- Infotainment
  - NETFLIX
  - iTunes
  - Pandora
- Productivity
  - Microsoft Office
  - Salesforce
- PAYD Insurance
  - MileMeter
  - Progressive

#### Vehicle Telematics
- Service Providers
  - Verizon Wireless
  - AT&T
  - Hughes Telematics
- Car Apps
- Car Rental/Share
  - AVIS
  - Hertz
  - Budget

#### OEM Car Care
- Aftermarket Car Care
  - Driverside
  - Costco Wholesale
  - Jiffy Lube
- Online Business
  - eBay
  - Amazon
  - Google
- Energy Producers
  - PG&E
  - ExxonMobil
- Road/Parking Ops
  - Bechtel
  - Cintra

**New Mobility Services**
Expand Traveler Choice → Transformations

NEW MOBILITY OPTIONS

Dynamic Ridesharing

Smart Paratransit

Carsharing

Conventional Transit

NEVs
Electrification and Connectivity
Transformations
(which evolve from incrementalism/evolution)

→ Recent transformations: Containerization, jet travel

→ “From Building Cars to Selling Travel Time Well Spent” (Cisco)
→ Is Nextgen transformational (or just making the system work better)?

→ New mobility services (demand-responsive paratransit, dynamic ridesharing, carsharing, smart parking, etc).

• Huge opportunities
  – Large value of connecting vehicles to internet ($1400/veh)
  – Only $0.001 to create connected infrastructure (Cisco)
  – NextGen
  – Efficient transport/LU systems
  – Potential for much less cost, energy use, space, and environmental impact

• Need new financing system (VMT tax?)
• Need public/private partnerships (because so much of transport is in public sector)
Challenges and Opportunities for TRB and Research Community

- Perfect fit for TRB mission: connect research with action
- Advisory reports for state and federal DOTs
  - How to stimulate and manage innovation
  - Overcome stovepipe organizations, risk-averse cultures
- Greater support for outreach and dissemination of research (training, databases, websites)
- “Policy studies” on how to stimulate innovation (smarter, better, faster), including lessons learned?
  - Document lessons learned (failures and successes)
  - Roles/relationships of govt and industry
- Greater engagement with industry via ???
- Support broader training of workforce
  - More interdisciplinary, esp social sciences