2017 ITS-NY TWENTY-FOURTH ANNUAL MEETING
“ITS Mobility – A New World”
June 15-16, 2017; Saratoga Springs, NY

AGENDA

Thursday, June 15, 2017
7:30 a.m. Registration Desk and Exhibit Hall Open; Full Breakfast in Exhibit Hall Foyer
9:00 Opening Session – “ITS Mobility – A New World”
  Welcoming Remarks by NYSDOT Host Region: Sam Zhou, Regional Director, NYSDOT Region 1
  Opening Keynote: Todd Westhuis, Regional Director, NYS Department of Transportation Reg. 8

9:45 Break in Exhibit Hall

10:15 Panel 1: ITS – Changing the Way We Do Business
  Panel Moderator: Dr. Isaac Takyi, MTA
  “Progressive Design-Build and Systems Engineering – A New Approach,” Dave Binkley, Iteris
  “Cashless Tolling at the Bayonne Bridge: Changing the Way We Do Business to Meet Operational
  and Customer Needs,” Dr. Allison L.C. de Cerreño, The Port Authority of NY & NJ
  “NYC Subway Real-Time Customer Information Using Beacon Train Tracking Technologies,”
  Dino DiPietro, MTA IT
  “The Impact of Connected and Autonomous Vehicles on the Way We Do Business,”
  Dr. Alain Kornhauser, Princeton University

11:45 ITS-NY Luncheon (Exhibits Closed for 45 minutes during Lunch)
  Keynote: Cordell Schachter, Chief Technology Officer, New York City DOT

1:00 p.m. Spotlight Presentation: Joseph Batista, Chief Technologist, HP, “The 5 Voices of Technology”

1:30 Panel 2: Disruptive Technologies
  Panel Moderator: Dr. Arthur O’Connor, FHWA
  “New York City’s Connected Vehicle Program,” Dr. Mohamad Talas, New York City DOT
  “Using Unmanned Aircraft Systems for Transportation Applications,” Glenn Stott, New Jersey DOT
  “Advances in Modeling and Simulation of Connected Vehicles for the Evaluation of Safety
  Focused Deployments,” Dr. Kun Xie, New York University C2SMART Center
  “Tampa and Cheyenne, WY Connected Vehicle Pilots,” Tom Kearney, FHWA

3:00 Break

3:30 Panel 3: The Human Ingredient
  Panel Moderator: Sue Thomas, KLD
  “Impacts on ITS – How ITS is Shaped by Human Factors,” Dr. Brian Philips, FHWA
  “WAZE and Crowdsourcing,” Tom Batz, TRANSCOM
  “Understanding User Interactions with Transit Smartphone Applications,”
  Dr. Candace Brakewood, City College
  “The Columbus Smart City Project,” Katie Zehnder, HNTB

5:00 Brief Break
5:15 – 6:00 Awards Session
6:00 – 7:30 p.m. Reception in exhibit hall
Progressive Design-Build & Systems Engineering
June 15, 2017
ITS New York
David Binkley
Design-Build & Systems Engineering

• 2 Not-So-New Approaches are coming together in ITS
  – Perhaps different motives, but
  – Perhaps together we can achieve better outcomes

• Does it have to be Either / Or?
Design-Build

• Design Build is…
  – *method of project delivery* in which one entity – the design-build team – works under a single contract with the project owner to provide design and construction services.

• Started with Construction, Commercial sectors
  – Now, growing into public sector construction
  – More recently including ITS

• Advantages – one contract, one point of contact, responsibility, potential to reduce cost, increase speed
Design Build

Traditional Project Delivery
- OWNER
- DESIGNER
- CONTRACTOR
- SUB-CONSULTANTS
- SUB-CONTRACTORS

Design-Build Project Delivery
- OWNER
- DESIGN-BUILD ENTITY
- SUB-CONSULTANTS

Graph showing trends from 2015 to 2013.
Systems Engineering

• Systems Engineering is…
  – Interdisciplinary approach and means to enable the realization of successful systems.
  – Focuses on defining customer needs and required functionality early in the development cycle
  – Documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem
Systems Engineering Principles

• Start with Your Eye on the Finish Line

• Stakeholder Involvement is Key

• Define the Problem before Implementing the Solution

• Delay Technology Choices

Identify & Detect Defects as Early as Possible
Does It Have to Be Either Or?

Design-Build
Design-Build & Systems Engineering

• Look at the scope / motivation of each
  – D-B == construction, project delivery
  – S/E == architecture, ConOps, requirements, V&V, O&M

  – Key to a successful DB project is being sure of what you want up front and having good documentation so contractor and customer can interact productively
  – That’s what S/E does really well – capture requirements and identify risk areas early
Perhaps they belong together

• Starting with our regional architectures – the collective vision of ITS in our region for the next 20+ years

• Work with stakeholders to build ConOps and good Requirements specifications

• Use SE artifacts / documentation to provide input to procurement process
  – Seek qualified bidders to do the Design and Build, req a compliance matrix as part of submittals
  – Use SE to determine a compliant design and a successful build.
Concluding

Don’t say “we’re not doing S/E because we’re doing D-B”
Say, “we’re doing D-B so we are going to need S/E”
Cashless Tolling at the Bayonne Bridge
Changing the Way We Do Business

Allison L. C. de Cerreño, Ph.D.
Assistant Director
Tunnels, Bridges & Terminals
Port Authority of NY & NJ
Presented at ITS New York
June 14-16 | Saratoga Springs, NY
Financial and Customer Changes

Electronic Tolling (Cash and E-ZPass)
• Customers pre-pay or pay at the toll point
• No stopping to pay toll for customers with tags
• Requires a tag in vehicle
• Treats owners of vehicles without tags as violators

All-Electronic Tolling (AET)
• Customers pre-pay or post-pay
• No stopping to pay toll for everyone
• Customers without tags are no longer treated as violators at the point of toll
Changes in How We Provide Service – A Regional Approach

Proximity of Facilities

Bar Set by E-ZPass
• One invoice (Toll Bill)
• One website
• Common business rules

Ensure Deadlines Met for Each Agency
• Used MTA TBTA Henry Hudson Bridge Pilot as the base case
• Utilized phased approach

MTA B&T NYSTA PANYNJ

<table>
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<tr>
<th>Facilities</th>
<th>MTA B&amp;T</th>
<th>NYSTA</th>
<th>PANYNJ</th>
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<tr>
<td>7 bridges</td>
<td>2 bridges</td>
<td>4 bridges</td>
<td></td>
</tr>
<tr>
<td>2 tunnels</td>
<td>NYS Thruway</td>
<td>2 tunnels</td>
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<tr>
<td>10 toll plazas</td>
<td>62 toll plazas</td>
<td>8 toll plazas</td>
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2016 Facts and Figures

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<tr>
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<th>MTA B&amp;T</th>
<th>NYSTA</th>
<th>PANYNJ</th>
</tr>
</thead>
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<td>$1.9B</td>
<td>$0.7B</td>
<td>$1.7B</td>
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<tr>
<td>Traffic Volume</td>
<td>307.1M</td>
<td>265.7M</td>
<td>237.6M*</td>
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<tr>
<td>E-ZPass Market Share</td>
<td>85.9%</td>
<td>72.0%</td>
<td>83.3%</td>
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<tr>
<td>E-ZPass Accounts</td>
<td>3.1M</td>
<td>1.8M</td>
<td>0.4M</td>
</tr>
</tbody>
</table>
Behind the Scenes

Areas That Had to Align

• Program Name
• Account types
• Treatment of invalid tags
• Plates per account
• Tolls by Mail bill
• Website
• Off-site cash locations
• Signage

Areas Where Differences Could Exist (and were preferred)

• Violations
• Education/marketing
Memorandum of Agreement

Designed to Allow Other Agencies in the Future

Capital Costs
- Common costs shared equally
- Agency specific costs borne fully by each Agency
- Volume sensitive allocated based on volume

Operating Costs
- Common costs allocated by usage
- Agency specific borne fully by each Agency

Initial Late Fee
- Allocated by usage
- Discarded when escalated to Violations
New York’s Regional Tolls by Mail Program Timeline

2008-2010
• PANYNJ and other agencies began discussing cashless tolling
• PANYNJ developed concept of cashless tolling in traditional lanes

2012-2013
• Nov 2012 – TBTA Tolls by Mail pilot at Henry Hudson Bridge
• MTA, NYSTA, PANYNJ began joint meetings on NY-based regional cashless tolling program

2015-2017
• 2015 – Implemented Phases 1 and 2 in the back office
• 2016 – Implemented Phases 3a and 3b in the back office
• Apr 2016 – NYSTA Tolls by Mail at Tappan Zee Bridge
• Feb 2017 – PANYNJ Tolls by Mail at Bayonne Bridge
**Changing the Way We Do Business – Lessons**

1. **Principles** – established them early and stuck to them

2. **Terms** – developed and maintained a glossary of key terms with agreed-upon definitions to avoid misinterpretations

3. **Operations** – developed customer service scripts and templates early in the process to influence requirements at the outset, minimize changes later, and avoid rush to deployment

4. **Costs** – understood how requirements drive volumes and impact customer service both in terms of the overall program and in terms of fairly determining cost share

5. **Customers** – build in flexibility to the extent you can since customers don’t always act as anticipated
NYC Subway Real-time Customer Information using Beacon Train Tracking Technology

Dino J. Di Pietro
MTA-Information Technology

Presentation at the 24th ITS-NY Technology Conference and Exhibition, Saratoga Springs, NY, June 15, 2017
Overview

What is a Beacon?

Beacon in wireless technology is the concept of broadcasting small pieces of information. The information may be anything, ranging from:

- Ambient data (temperature, air pressure, humidity)
- Micro-location data (asset tracking, retail)
- Orientation data (acceleration, rotation)
- Acceleration

With the use of Bluetooth low energy (BLE), beacons can be designed to run for years on a single coin cell battery or they can be plugged into an outlet or USB port instead to maintain consistent power.
What have we been doing?

MTA-IT has:

- Researched new beacon technologies that have shown promise in providing train arrival information for countdown clocks and mobile devices for the “B” Division.
- We have conducted a feasibility study over the last several months to test the use of beacon technology in stations and subway cars.
- We have worked with Transit Wireless to use their wireless infrastructure along with in-house developed software to transmit train location information to a cloud-based Train Location Database.
- We have developed a prototype app which also uses Transit Wireless infrastructure to display forecasted train arrival times based on data in the Train Location Database.
Overview

What we have discovered

- Beacons can reliably provide train location information.
- Beacons do not have the environmental constraints that inhibited previous attempts to provide train location information on the “B” Division.
- Cost is a fraction of the traditional approach to countdown clocks (“A” Division costs are approximately one million dollars per station).
- Approach does not require invasive modifications to station infrastructure.
- Transit Wireless can provide the infrastructure needed for communicating train location information – no cabling of stations will be needed.
- We can use commercially available commodity priced hardware to economically provide “B” Division countdown clock displays.
- We can leverage “cloud resources” to provide back-end computing resources.
System Concept and Design

- Beacon on train
- Receiver (BLE)
- Transit Wireless System
- Internet Cloud
- NYCT System
- Displays at RCC
- Riders using app
- Information via Internet
- Database
- Server
- Information display
- MTA
- Other Stations
- Station
- Bluetooth
- WiFi/Cellular
- Coney Island
- Stillwell Ave.
- Bay Ridge
- 95th St.
Approach

Process

- Proof of Concept (POC)
- Executive Buy-in
- Pilot
- Procurement and Installation
- Roll out
Approach

What defines success?

- Accuracy of location data
- Acceptable Performance of Transit Wireless Solution
- Performance of LCD/computer wireless displays
- Physical and Network Security
  - Beacons
  - Bluetooth Receiver
  - Cloud Processing
  - Wireless Countdown Clock Displays
- Internal access and use of data being generated
- Integration with existing legacy systems
Implementation Environment

- 267 Subway stations
  - 159 underground stations
  - 108 elevated stations
- 3 Information displays per station
Implementation

Potential Challenges

- Diversions and re-routes (affects 3% of B Division trips)
  - Mitigation –
    - Leverage ITRAC data
    - Utilize self identifying beacons to automatically associate a specific train with its location
    - Investigate the use of emerging UWB (Ultra Wide Beam) beacon capabilities to report location within 10 inches

- Integration with other systems
  - ITRAC (Integrated Train Register Activity Console)
  - GMS (Global Messaging System)

- Dependence on Transit Wireless implementation
  - Transit Wireless original scope of work was providing standard customer wireless access (Cell and WIFI)
  - Modify contract to provide high level SLA’s for countdown clock high reliability
Working with Transit Wireless we selected (5) B Division stations:
28th St - local
34th St - express
42nd St -express
57th St - local
5th Ave/59th St. – local

As part of the POC, we considered evaluating 2 beacon technologies.

1) Low Energy Bluetooth beacons – current industry standard

2) Wi-Fi beacons – would require less infrastructure on stations
Implementation

**Pilot** \((N, Q, R)\) 97% Accuracy

Initial Pilot equipment (4 receivers, 15 signs, 914 beacons)

**Roll out** \((R, C, E, N \ldots)\)

Roll out equipment based on station configuration and train car consist
Implementation
Detailed POC Schedule

- January 2015: Preliminary beacon detection tests, 1st Beacon-Tablet Test
- February 2015: Feasibility Study IRT #1 line, Engage with Transit Wireless
- March 2015: Coding and Testing
- June 2015: Field Test 4 Locations, Station Demos
- October 2015: N/R line work begins, API Testing
- December 2015: Product research, Source Equip, API NQR Trial
- January 2016: Code and Test NQR
- March 2016: Timetable Mgmt, Beacon Vendor Selection, NQR Demo
- June 2016: Equip Install & Test NQR, Go Live NQR Line
- Nov 2016 2nd Ave Line: Equip Install & Test 2nd Ave Line, Go Live New Years Day!
# Implementation Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
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<tbody>
<tr>
<td>Jan - Dec 2015</td>
<td>(POC I)</td>
</tr>
<tr>
<td>Jan - Dec 2016</td>
<td>(POC II)</td>
</tr>
<tr>
<td>2017</td>
<td>Roll out</td>
</tr>
<tr>
<td>Jan - Feb 2017</td>
<td>Roll out surveys</td>
</tr>
<tr>
<td>July 2017</td>
<td>R – Line</td>
</tr>
<tr>
<td>August 2017</td>
<td>C - Line</td>
</tr>
<tr>
<td>September</td>
<td>E, N – Line</td>
</tr>
<tr>
<td>October – onwards</td>
<td>All subsequent “B” Lines</td>
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</table>
Implementation

Other Applications

Potential Use Cases for Beacons
- Consist Management
- Train Location + Prediction
- Reports

Install Beacons on Work Trains
- Location Tracking

Installation of “Readers” in Terminals and Yards
- Identify key locations
Benefits

- Implementation and Maintenance costs will be a fraction of the traditional contractor based support.
- Roll out can quickly follow Transit Wireless installation of wireless services in below ground stations.
- Data can be immediately delivered to the RCC in real time.
- Leverages investment in Transit Wireless infrastructure.
- Expandability is modular – does not require contiguous stations or a complete line to have wireless services. (Can be done on a station by station basis as wireless services become available.)
- Commodity based pricing for all components.
Benefits (cont’d)

- Can be used to assist operations with consist management.
- Data can be used to evaluate wait times.
- Data can be made available to app developers as it has been for the A Division.
- Countdown clocks can be configured and located in order to maximize value from digital advertising.
- Flexibility in sizing and sourcing and location of high resolution displays.
- Can leverage approach to provide wireless audio via Bluetooth speakers to stations with no audio capability.
Conclusion

Beacon Train Tracking is an innovative, low-cost, effective, reliable, and easy to implement solution to provide real-time train arrival information that is distributed to Transit systems, MTA.info, count down clock at subway stations and smart phones for the “B” Division (lettered) lines

Utilize five integrated technologies:

- Bluetooth to capture train location
- Wireless Wi-Fi (provided by a 3rd carrier) for communications
- Cloud computing for data processing
- Train tracking system to forecast train arrival and departures
- LCD monitors to display information at stations including Text to Speech capability
The Impact of SmartDrivingCars on the Way we do Business

by

Alain L. Kornhauser, PhD

Professor, ORFE
(Operations Research & Financial Engineering)
Director, CARTS
(Consortium for Automated Road Transportation Safety)
Faculty Chair, PAVE
(Princeton Autonomous Vehicle Engineering)
Princeton University

Presented at

ITS-NY
Twenty-fourth Annual Meeting
Saratoga Springs, NY

June 15, 2017
Making Sure We Are Using the Same Terminology...

- Lots of confusion... 'Connected'; 'Autonomous', 'Automated', '4 NHTSA Levels' '5 SAE Levels'...
- Only 3 kinds:
  - ‘Safe-Driving Cars... (Trucks or Buses)’
    - Always on Automated Emergency Braking & Lane Centering
    - Delivers: Safety
      - Needs Insurance to Promote Wide-spread Adoption w/o Government Mandate
‘Safe-Driving Cars’... All About SAFETY

• **On... ALL the Time** (in the background, watching, waiting...)
• To ‘Bail out’ Drivers when they do something ‘stupid’...
• We already accept some of this automated technology...
  – Anti-lock Brakes
  – Electronic Stability Control

Both: **Override** the driver and “**Do the right thing**”
‘Safe-Driving Cars’... All About SAFETY

• On... ALL the Time (in the background, watching, waiting...)
• To ‘Bail out’ Drivers when they do something ‘stupid’...

• We already accept some of this...
  – Anti-lock Brakes
  – Electronic Stability Control
  – Extend these to...
    • Don’t run into things
Fundamental AV Concept

http://orfe.princeton.edu/~alaink/SmartDrivingCars/Videos/Subaru%20EyeSight_Commercial60secCrashTest.mp4
https://www.youtube.com/watch?v=yARbNYcjPQM

Fundamental AV Concept
Fundamental AV Concept

http://www.youtube.com/watch?v=dWj44GjrSs0
‘Safe-Driving Cars’... All About SAFETY

• On... ALL the Time (in the background, watching, waiting...)
• To ‘Bail out’ Drivers when they do something ‘stupid’...
• We already accept some of this...
  – Anti-lock Brakes
  – Electronic Stability Control
  – Extend these to...
    • Don’t run into things
  – Unfortunately, some on the market don’t work well...
<table>
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<tr>
<th>Speed reduction (mph)</th>
<th>12 mph test</th>
<th>25 mph test</th>
<th>Forward collision warning</th>
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<tr>
<td></td>
<td>less than 5</td>
<td>5 to 9</td>
<td>less than 5</td>
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<tr>
<td>Points</td>
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<td>1</td>
<td>2</td>
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**Speed reduction in 12 and 24 mph tests**

- **Volvo S60**
  - 2 point advanced

- **Dodge Durango**
  - 3 point advanced

- **Subaru Outback**
  - 6 point superior
One could reasonably argue that if a technology can save 10k or 20k lives and hundreds of thousands of injuries per year in the US it should be (1) affordable and (2) not be optional equipment. **Contrary to this, we found the majority of models currently available either do not offer active safety features or offer them only as optional equipment at prohibitively high costs. Our key takeaways are summarized below:**
Only 12% of vehicles sold in the US year-to-date are equipped with standard AEB, of which 2/3 (8% of overall vehicles sold) are made by Toyota. Total cost safety ownership ranges between an additional 2.5% (or $900) on top of base vehicle MSRP up to 60% (or $18,220).

We also observed that safety package options are often only available on top-tier trims within a model.

None of GM, Ford or Fiat offer standard active safety equipment on models sold this year.
Exhibit 18: Distribution of AEB City Speed availability by OEM

Source: Autodata, Consumer Reports, Morgan Stanley Research

Exhibit 19: Distribution of Lane Departure Prevention availability by OEM

Source: Autodata, Consumer Reports, Morgan Stanley Research
NHTSA’s full final investigation into Tesla’s Autopilot shows 40% crash rate reduction

Figure 11. Crash Rates in MY 2014-16 Tesla Model S and 2016 Model X vehicles Before and After Autosteer Installation.

Safe-Driving Cars: Impact on the Way we do Business

• Consumers:
  – Respond to the affordable ADAS-equipped cars and buy Toyota, Volvos, Subarus, Teslas and Benzes

• Insurance:
  – Recognize the **LOSS Prevention** of ADAS-equipped cars and especially encourage their higher risk customers to purchase the best ADAS-equipped cars.

• Public fleet purchasing agents:
  – Purchase ONLY ADAS-equipped vehicles. Since public entities can’t run away from the crash liability exposure, ADAS “prints money”

• Public Risk Pools:
  – Incentivize and insist that purchasing agents buy ONLY the best ADAS-equipped vehicles
    • This is beginning to happen with Transit Risk Pools & Transit Agencies

• NHTSA/IIHS/Consumer Reports/Public Oversight/???
  – Establish a consistent naming and stringent rating system for ADAS

• Auto Manufacturers
  – Substantially improve the price/performance of their ADAS offerings
Making Sure We Are Using the Same Terminology...

- Lots of confusion... ‘Connected’; ‘Autonomous’, ‘Automated’, ‘4 NHTSA Levels’ ‘5 SAE Levels’...

- Only 3 kinds:
  - ‘Safe-Driving Cars... (Trucks or Buses)’
    - Always on Automated Emergency Braking & Lane Centering
    - Delivers: Safety
      - Needs Insurance to Promote Wide-spread Adoption w/o Government Mandate
  - ‘Self-Driving Cars... (Trucks or Buses)’ [Link](https://electrek.co/2017/06/12/first-drive-tesla-autopilot-2-0-autopark/)
Self-Driving Cars: Impact on the Way we do Business

• **Consumers:**
  – Will pay almost anything for this feature that “enables texting”

• **Insurance:**
  – Make sure Self-driving doesn’t compromise Safety Gains of Safe-driving Cars

• **Public fleet purchasing agents:**
  – Stay away from this technology

• **Public Risk Pools:**
  – Incentivize and insist that purchasing agents buy ONLY Safe-driving cars

• **NHTSA/IIHS/Consumer Reports/Public Oversight/???:**
  – VMT is going to go through the roof. Trip lengths will increase as will congestion.

• **Auto Manufacturers**
  – This is their new 21st Century “Corinthian Leather”, “Chrome” & “Fins”.
Making Sure We Are Using the Same Terminology...

- ‘Connected’

Making Sure We Are Using the Same Terminology...

- Only 3 kinds:
  - ‘Safe-Driving Cars… (Trucks or Buses)’
  - Always on Automated Emergency Braking & Lane Centering
  - Delivers:     Safety – Needs Insurance to Promote Widepread Adoption w/o Government Mandate
  - ‘Self-Driving Cars…’
    - Safe-Driving + Ability to take Hands-Off Wheel and/or Feet-Off Pedals
      - On Some stretches of Some Roads and Some Times
    - Delivers:     User Convenience + some Environmental Benefits
  - ‘Driverless Cars … (Cars, Trucks or Buses)’
    - Safe-Driving + Always: Hands-Off, Feet-Off; No Steering Wheel or Pedals
      - Sharing Some Streets at Some Times with Conventionally-driven vehicles
    - Delivers:     Mobility for All + Substantial Environmental Benefits
Driverless Cars: Impact on the Way we do Business

• Consumers:
  – Multiple car households in cities and suburbs will decrease enormously and those cars will be used occasionally and NOT in commuting

• Insurance:
  – Personal car insurance will decrease by at least a factor of 10.

• Public/private fleets:
  – Large Fleets will offer shared-ride on-demand mobility as a service.
  – Affordable high-quality mobility will be available to essentially “all”.
    • Young, old, handicapped, those under the influence

• Public/Private Risk Pools:
  – Will cover the greatly reduced risk exposure of this form of mobility

• NHTSA/IIHS/Consumer Reports/Public Oversight/???
  – A new agency will emerge to provide the public oversight on this new form of mobility
  – Zoning regulations associated with parking will change substantially changing the value and availability of land. Ridesharing will alleviate congestion. Little need for new roads

• Auto Manufacturers
  – May not be the ones manufacturing this form of mobility
  – Local goods movement will be done using driverless technology
Discussion!

Thank You

alaink@princeton.edu

www.SmartDrivingCar.com
Outline

• “Safe Driving Vehicle”: 1939 -> Today +
  – What is a “Safe Driving Vehicle” (aka DriverLessCars/SmartDrivingCars/Self-drivingCar/autonomousCars)
  – The 1st 75 years: (1939 -> 2014)
    • 1939 -> DARPA Challenges
    • DARPA Challenges -> Today
  – “Safe”: Accident Mitigation v Accident Avoidance
  – The Opportunity for the Insurance Industry:
    • Trucks; Buses; Cars
  – Questions & Discussion
Scope of “Safe Driving Vehicle” & Automation

- Surface Transportation Vehicle
  + Running Surface
    (aka roadway, guideway, railway)
Technology for Technology’s sake

- The Evolution of Safe Driving Vehicle Technology to date
4. FUTURE CHANGES LIKELY TO IMPACT TRANSPORTATION

Major changes are occurring across the nation and in the NYMTC planning area which are likely to significantly transform the provision, management and use of transportation services and facilities. The drivers of these changes could, and in fact in some cases already are, redefining when, how and why people are traveling and goods are being moved during the planning period. Examples include the following:

- Personal mobility is likely to evolve from vehicle ownership toward increased use of shared, on demand, possibly autonomous vehicles.
- Goods movement is likely to be impacted by technological changes including additive manufacturing (also known as 3D printing), vehicle automation and automated delivery, and the further automation of goods production.

At this writing, it is impractical to quantitatively predict the impact that the drivers of change identified above may have on the trends and forecasts in this section of the Plan, as well as the operation of the transportation system in the NYMTC planning area. However, there is little doubt that some combination of these drivers will have an impact on either or both demand for transportation and/or the manner in which transportation services are provided. Impacts will likely also be felt in the way in which transportation planning is accomplished.

Although quantitative predictions of the impacts of the drivers of change on transportation demand and supply is impractical as of this writing, due mainly to uncertainty about the pace of technological development and its interplay with social adaptive behavior, some qualitative assessments can be made. For the purposes of Plan 2045, these qualitative assessments will need to be noted until better information on trends and behaviors is quantified.
Driver Charged in Crash Involving Tracy Morgan Had Not Slept in 24 Hours, Prosecutors Say
Hmmm... this is enormously tragic because existing collision avoidance technology could have likely avoided this accident altogether even if Mr. Roper had not slept for 48 hours or was in complete compliance with all "hours of service regulations". Even if Mr. Roper had not slept for 24 hours, tougher hours of service regulations would not have prevented this accident. What would have prevented this accident would have been the availability of collision avoidance technology on this truck. If Walmart somehow feels indisposed by this accident and wants to react constructively, Walmart should contribute to the advancement of collision avoidance technology and insist that all trucks moving their goods be equipped with such technology! In fact, calling this an accident may well be a misnomer; maybe we should call it irresponsibility on Walmart’s part for not insisting that the trucks serving their stores have this technology. The cost of this technology may well evolve to be more than offset by the reduction in truck insurance expense. In other words, Walmart would not be indisposed and save money. That doesn’t sound like an accident to me. It sounds like fiduciary (and societal) irresponsibility on the part of Walmart.

Of course, Walmart is not the only business that relies on long haul truckers to supply goods to its stores. The Tracy Morgan collision should be a wake up call for businesses that rely on large trucks on US roads every day driven by drivers operating under pressure on deadlines. Now that collision avoidance technology is available, Walmart and other business should insist that their logistics partners use trucks equipped with this technology. They will save money in the long run and lives in the short and long runs. Alain
Discussion!

Thank You

alaink@princeton.edu

www.SmartDrivingCar.com
Discussion!

Thank You

alaink@princeton.edu

www.SmartDrivingCar.com