Thanks to our presenters

Will Baumgardner
Fawzi Nashashibi
Hon. Rod Diridon, Sr.

Sam Lott
Jerry Lutin
Andriano Allessandrini

Guy Fraker
Keller Easterling
Mohammed Yousuf
Levels of Automation (NHTSA definitions)

- Level 0: No automation
- Level 1: Function-specific automation
- Level 2: Combined function automation
- Level 3: Limited self-driving automation
- Level 4: Full self-driving automation
### Mapping Between Technology and Issues

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<tr>
<th>Level</th>
<th>Issue 1</th>
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Take home messages (1)

• Automated vehicles are (probably) legal
• Wild west vs. dead hand of regulations
• Uncertainty and perceived risk
• Insurance industry product models under pressure
• Demand and energy consumption: murky, difficult to control
• White House: This stuff matters
Take home messages (2)

• Autonomous vs. connected
• Google: 5 yrs to level 4 (rumor has it)
• Cyber-security: think like a hacker
• Follow the data...
• Behavioral modelling
• A lot happens in 100M miles
• How good is “good enough” and who decides?
• TaaS: Transportation as a Service
• Transit, taxis, rentals: Less distinct?
Public and Private Transportation

- Public Transport / Bus, LRT, Rail
- Private Vehicles

- Bus and Rails
- ATNs
- PRT
- Car Sharing
- Ride Sharing
- Car Rentals
- Private vehicles

Soon to Be

20th Century
RNS Themes

• Automation Impact on Mobility Impaired
  o Demographics and trends
  o Existing mobility options contrasted to automation concepts
  o Mohammed Yousuf, Ron Boenau, Scott Levine, Shannon McDonald

• Practical / Near-term Issues of Automation in Transit Agencies
  o Level I/II automation concepts
  o Realistic cost/benefits of existing technology
  o Objective evidence data from known deployments
  o Retrofitting, standards, and planning for upgrades
  o Jerry Lutin, Alain Kornhauser, Will Baumgardner, Ramses Madou, Louis Merlin
RNS Themes

• **Shared Mobility**
  o Shared vehicles/ownership business models
  o Impacts to para-transit and other typical public transit functions
  o Induce greater public transit use, walking, biking
  o Jeral Poskey, Scott Levine, Jerry Lutin, Mohammed Yousuf, Dan Fagnant, Guy Fraker, Ramses Madou, Eugene Willard

• **Automation in Public Transit – a Holistic View**
  o Need to ask “What are the public transit needs that automation may address?”
  o Use case scenarios, understand built and institutional infrastructure
  o Windows for opportunity / pitfalls to avoid
  o Rod Diridon, Jerry Lutin, Stan Young, Alain Kornhauser
RNS Themes

• **Future Alternative Analysis for MPOs and NEPA Processes**
  - Primer and training for impact of automation and vehicle sharing concepts
  - Update of Characteristic of Urban Transport Systems (CUTS)
  - Current capabilities vs. future possibilities
  - Will Baumgardner, Sam Lott, Stephan Parker, Laura Stuchinsky, Stan Young

• **Promise of auto-parking: panacea or shifting the problem**
  - Realistic modeling of impact of auto-parking
  - What problems are solved / created? Airport implications
  - Realistic benefits for space management, parking consolidation
  - Shannon McDonald, Stan Young, Alain Kornhauser
RNS Themes

• Performance Measures for Automated Mobility in Urban Settings
  o In terms of Mobility, Safety, Comfort, and Service
  o Do current automation concepts have unforeseen long term consequences/impacts
  o It isn't just travel time!!!!
  o Fawzi Nashashibi, Louis Merlin, Dan Fagnant, Eva Frederich

• Exclusive Guideway vs Open Road
  o ARV on open roads will evolve to greater automation
  o ARV on dedicated guideways will evolve to more complex environments
  o Tradeoffs of Exclusive Infrastructure vs Re-Use of existing Roadway
  o Laura Stuchinsky, Alain Kornhauser, Louis Merlin, Stan Young
RNS Themes

• Legal Framework For Automated Driverless Transit
  o Systems vs automated vehicles on a highway
  o Synergism with City Mobile 2 concept
  o Fixed guideway as well as evolving to mixed use on roadways
  o Andriano Allessandrini

• Integration of Automation and Shared Mobility into the Urban Fabric
  o Benefits/detriments
  o Spatial constraints/opportunities/land planning
  o Perspective of quality of life, architecture, and development
  o Shannon McDonald, Adriano Allessandrini, Louis Merlin, Will B., Paul Godsmark, Ron Boenau, Dan Fagnant, Ramses Madou
RNS Themes

• Hazards Framework for Automated Transport Safety
  o Safety discussion difficult due to proprietary, closed-door approaches
  o APM industry benefitted from a standard hazards’ framework
  o Framework for RVA could reduce confusion, foster collaboration in industry & government, advance the timeline to viable products
  o Sam Lott, Paul Godsmark, Ron Boenau
Future Direction

• Continued emphasis (Task Force) on Delivering the Potential of Automation in Public Transportation and Shared Mobility
  o Programming of Research Statements from 2013
• 2014 Automated Road Vehicle – SanFrancisco
  • Emphasis on ARV and its impact on Urban Fabric
  o “A hands on workshop for autonomous vehicles: Imagining and creating visions for their relationships with the built environment”