Operating Future Transportation Systems

Session SS24: Establishing a Proactive, Integrated, and Reliable Transportation System

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Overview

- State of operations today
- Where operations is headed
- On-going research
Operations Today

Data Analysis
- Real Time Data Management
- Regional TMCs
- Fixed Traffic Surveillance and Sensor Technologies

Technology
- ITS Technology
- Advanced Speed Algorithms
- Information Sharing Technologies (Variable Message Signs, 511)

Photos Courtesy of WSDOT (http://www.wsdot.wa.gov/Projects/I5/ActiveTrafficManagement/gantries.htm) and MnDOT (http://www.dot.state.mn.us/rtmc/)
Where is the Future of Operations Headed?

1. Connected Vehicles
   - Vehicle-to-Vehicle (V2V)
   - Vehicle-to-Infrastructure (V2I)
   - Vehicle-to-Environment (V2X)

2. Cooperative Systems/Automation
   - Speed Harmonization
   - Platooning
   - Automated Vehicles

Where is the Future of Operations Headed?

3. Multiple Data Sources
- Vehicle Status Data
- Weather Data
- Truck Data
- Infrastructure Status Data
- Location Data

4. Multiple Applications
- Reduce Speed 35 MPH
- Weather Application
- Transit Signal Priority
- Real-Time Travel Info
- Fleet Management/Dynamic Route Guidance
- Safety Alerts and Warnings
- SPaT Adjusts Real-Time Conditions

Data Environment
Current Connected Vehicle Research

- Connected Vehicle Test Beds, e.g., Michigan, Virginia, Saxton Laboratory
- Dynamic Mobility Applications Program
  - Connected Transportation Systems
  - Pooled Fund Study
- National Connected Vehicle Field Infrastructure Footprint Analysis
  - AASHTO involvement
  - What is needed nationally to implement connected vehicles
Enabling Automation Technologies

- Speed Harmonization I-66
- Signal Coordination US-29/US-50
- Simulations and Experiments
  - Feasibility
  - Benefits
  - Testing and Demonstrations
    - Acquiring 5 test vehicles
Managing Multi-Source Data

- Research Data Exchange
  - www.ITS-RDE.net
  - Leesburg Vehicle Awareness Devices
  - Pasadena network data
  - Multiple Other Sources
  - Safety Pilot - Coming Soon

- High quality, well documented data
Integrating Future Technologies to Advance Today’s Operations Solutions

• Go Beyond the Gantry
  – Incorporating connected vehicle (V2I) technology into existing transportation management system
  – Utilize wireless technology to broadcast speeds and messages to traffic
  – Near-future solution: TMCs broadcast advisory information via in-vehicle signage

• Take Away Delay Through Automation
  – Longer term solution: TMCs broadcast information direct to vehicle control systems