Connected Corridor Initiative
Roadmap to Near-Term Connected Vehicle Benefits

Minnesota Department of Transportation
October 31, 2019
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Why are we talking about CAV & Connected Corridor?
• Respond to the SPaT Challenge

• Gain agency experience with DSRC and connected vehicle data

• Identify early benefits of DSRC through fleet use cases

• Further programs to share real-time data via mobile and traditional methods to increase value to MnDOT customers today
Signal Phase and Timing

• Broadcast Signal Phase and Timing (SPaT) and MAP information using DSRC

• Follow SAE J2735 message format

• Fulfill the SPaT Challenge
Geographic Overview

- 22 intersections

[Map showing TH-55 connected corridor, traffic signals, and interchanges.]
Systems Engineering Overview

WE ARE HERE
Schedule

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• Concept of Operations initiated in late 2017

• Interaction with a large range of internal and external stakeholders
  • MnDOT functional groups (ITS, traffic operations, maintenance, etc.)
  • Regional transit agencies (Metro Transit, Plymouth Metrolink)
  • Corridor communities (Minneapolis, Golden Valley, Plymouth, St. Louis Park)

• Identified top challenges and derived user needs
Vehicle-Pedestrian Conflict Warning

- Warn driver of a pedestrian crossing a conflicting crosswalk
- Infrastructure-based detection of pedestrians
- Initial deployment in buses
Mobile Work Zone Warning

• Provide warning to vehicles upstream of a moving work zone (i.e. maintenance and plowing operations)

• Maintenance vehicles communicate directly to MnDOT systems

• Automated messages via DMS, mobile application and DSRC messaging
Snow Plow Signal Priority

- Provide signal priority for snow plows during active plowing operations
- DSRC-based signal priority
- Support improved plow efficiency and safety of roadway during snow events
Signal Phase and Timing

SPaT Data Considerations

• SAE J2735
• Lear Connexus Roadstar RSU
• Broadcast 10 times per second
• Accompanied by Intersection MAP Data
• Archive?
- Range of 1000 feet
- Heat map
- Rain/snow
Third-Party Traffic Signal Data Sharing

- Create standardized process for publishing traffic signal data to third-parties (web portal)

- Accelerate availability of information to customers for eco-driving and other applications
Project 1805: Network Security Design for Connected Vehicles

Private Sector Provider
Green Hills INTEGRITY Security Services (ISS)
Controller Challenges

• ASC3 controller
  • ASC3 software
  • Tried and true but no signal priority

• Cobalt controller
  • EOS software
  • Does signal priority but needs more testing from Metro Signals
  • Pedestrian issue
RSU Challenges

• Mounted downwards to meet line of sight requirement
Challenges

• Building an understanding of new technology throughout MnDOT

• Schedule, budget

• New technology for public – consumer does not have DSRC yet
Thank you!

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