CDOT’s Pilot Signal Phase & Timing (SPaT) Deployment Plan

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OUTLINE

- AASHTO SPaT Challenge
- DSRC Deployment Corridor(s)
- Purpose and Objectives
- Benefits of Early Deployment
- Draft ITS Architecture
- Implementation Timelines
- Pilot Demo/Video

What is SPaT Challenge

- DSRC Infrastructure
- SPaT Broadcasts (MAP/GID)
- One Corridor or Network of 20 Intersections
- All 50 states by Jan 2020
- SAE Standard (J2735)

Source: AASHTO SPaT Challenge Website
What is SPaT & DSRC

- SPaT Message – Signal Phasing and Timing
  - Signal Status
  - Speed and Location (GPS)
- DSRC – Dedicated Short Range Communication
  - 5.9GHz Radio
  - FCC Licensing
  - CV Applications
What is MAP/GID Data

- MAP/GID Data – (Geographic Intersection Description)
  - Broadcast MAP/GID data
  - Detailed Intersection Geometry
  - RTCM
    - GPS Correction
Selection of Corridors

- Considerations for the V2I applications
  - Saturated Peak Conditions
  - Multi Modal Arterials
  - Preemption Activations
  - Snow Plow Activity
- Infrastructure Compatibility
  - Hi-Res Controllers/ NTCIP Protocol
  - Backhaul Communications
  - Additional Cabinet/Conduit Space

https://www.pcb.its.dot.gov/standardstraining/mod43/ppt/m43ppt.htm
Arterial Corridors

- CDOT SpaT Implementation Corridors
  - Wadsworth Blvd (SH 121) Corridor
    - 33 Intersections
  - Arapahoe Rd (SH 88) Corridor
    - 12 Intersections
- Arterial Routes of Significance
- Upgraded field infrastructure
- Major Commuter Routes
- Operating at or near capacity during peak hours
Purpose & Objectives

- Gain valuable procurement, licensing, installation and operation experience
- Foundation for more advanced V2I deployments
- Show commitment to OEMs, automotive industry and application developers
- Understand construction and maintenance costs
- Develop a checklist of common design, approval, and installation activities
- Determine ITS Architecture and backhaul communication requirements
Benefits

Short Term:
- Test site for CV applications
- Preparation for the DSRC-enabled vehicles and on-board applications
- Support advanced deployments
  - Snow Plow Priority
  - Red Light Violation Warning
  - MMITSS Applications (TSP)

Long Term:
- Agency utilization of the V2I data
- Improving safety & mobility
ITS Architecture

Advanced Transportation Controller (ATC)
- Intelight

On-Board Unit (OBU)
- WaveMobile

Road Side Unit (RSU)
- WaveMobile, Lear, Kapsch (bench testing)

Mobile App
- Smart Driver (Intelight)

Data Warehouse
- Panasonic CV Eco System/CDOT CTMS
SPaT Challenge Timelines

- **September 2017**: Signed up for AASHTO SPaT Challenge
- **June 2018**: SPaT Demo
  - Demo at three intersections
- **October 2018**: Collaboration
  - Working with Panasonic and Intelight to develop ITS Architecture & Backhaul Communications
- **June 2019**: Field Deployment
  - SPaT implementation
- **December 2019**: Field Testing
  - Verification and Validation

CDOT SPaT Deployment
Demo SPaT Data

Colfax and Tower Rd

- OBU: WaveMobile
- RSU: WaveMobile, Kapsch, Lear
- Intelight 2070LC ATC

- Smart Driver App -
  - Signal Indication (color)
  - Time Until Change
  - Permitted Maneuvers
  - Speed Limits
Next Steps

• Secure FHWA AID grant
• Develop SEA documents
• Release RFP for SPaT Deployment
• Vendor selection

• Field Deployment
• Field Testing - Verification and Validation
• Lessons Learned

CDOT SPaT Deployment
Thank you!

Questions

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