The Future of the Connected Vehicle

AASHTO Standing Committee on Highways
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MDOT Connected Vehicle Activities

**Data Use**
- DUAP - Phase 1 & 2

**Data Collection**
- Critical Highway Infrastructure Monitoring Project
- Partner OEM Data
- Vehicle Based Info & Data Acquisition System
- Slippery Roads Detection Project
- Integrated Mobile Observations 2.0
- ACC/IRI/PASER Study
- USDOT Safety Pilot (UMTRI)
- AVL/GPS MDOT Fleet Project

**Data Dissemination**
- I-94 Truck Parking Info and Mgmt System
- Multipath SPaT Project

**Pooled Fund/Research**
- AASHTO CV Deployment Coalition
- CTS Pooled Fund Study
- CAR CV Research Project
- CV Driving Simulator
A Connected Future
Preparing for Regional Deployments

CONNECTED VEHICLE INFRASTRUCTURE FOR SIGNALIZED INTERSECTIONS

Equipment shown in red is new equipment required in most locations.

Note: Signal controllers will minimally require firmware upgrade but may require replacement.

Controller Cabinet (see right)

5.9 GHz DSRC Roadside Unit (RSU)

Controller Cabinet

SPaT Interface Module

Ethernet Switch

Signal Controller

Current Architecture to Support Connected Vehicle Interface

Controller Cabinet

Signal Controller with Native SPaT Interface Functionality

Ethernet Switch

Anticipated Future Architecture to Support Connected Vehicle Interface
US DOT Safety Pilot Data

**SPaT**
- Expected: Total for 8 RSEs = 6,912,000 messages per day
- Actual: Total for 8 RSEs = 28,821,437 messages per day

**MAP**
- Expected: Total for 7 RSEs = 691,200 messages per day
- Actual: Total for 7 RSEs = 2,510,384 messages per day

**TIM**
- Expected: Total for 3 RSEs = 259,200 messages per day
- Actual: Total for 3 RSEs = 227,766 messages per day

**BSM**
- Expected: Total for 26 RSEs = 6,516,458 messages per day
- Actual: Total for 26 RSEs = 16,740,785 messages per day

**Storage Size (total file storage + database size per month)**

<table>
<thead>
<tr>
<th>Files</th>
<th>Database</th>
<th>Total</th>
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<tr>
<td>4.6 TB</td>
<td>13.8 TB</td>
<td>18.4 TB</td>
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What’s Next?
The MTC
What can we collectively do?

Follow Connected Vehicle Developments (USDOT)

Partner!

Develop workforce

Think beyond infrastructure – look to vehicle fleet

Determine “application” and data needs

“Mainstream” technology
Questions?

MDOT