Michigan DOT Connected Vehicle Initiatives

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NOCoE Regional Forum

Session 1: Innovation and Emerging Technologies

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Session 1: Innovation & Emerging Technologies
Infrastructure Readiness for Connected Vehicles & Traffic Signal Performance Measure Applications

- Number of state sponsored/hosted pilot programs in the following areas:
  - Connected vehicles - **Multiple**
  - Automated vehicles - **Multiple**
  - Fully autonomous vehicles - **None**

- Which wireless technologies does your agency currently use for infrastructure-based (I2I/V2I/I2V) communications?
  - 5.9 GHz DSRC - **Yes**
  - Commercial Cellular Services - **Yes**
  - WiMax - **Yes**
  - Wi-Fi - **Yes**
  - Bluetooth - **No**

- Does your agency have a formal institutional structure for overseeing the deployment/management of strategies to support I2I/V2I/I2V communications? - **Yes**

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- Number of signals currently broadcasting Signal Phase and Timing (SPaT) info: **16 (Approx. 100 including MI partner agencies)**

- Number of SPaT broadcast deployments currently planned by 2020: **TBD**

- Number of other roadside units (RSUs) broadcasting infrastructure information: **11**

- Approximate breakdown (%) of signal controller inventory by the following standards (intended to ensure compatibility with connected vehicle applications)?

  - ATC 5.2b:**Less than 5%, but became current standard in the last six months.**
  - Model 2070LX, E, L: **2%**
  - NEMA, Modern (e.g., Econolite ASC3, Ethernet port is present): **20 – 30 %**
  - Type 170, Modern (Ethernet port is present): **0%**
  - Incompatible (e.g., NEMA Legacy, Electromechanical): **60-80% (Based on Region)**

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- Number of signal controllers currently running CV applications: **0**

- Number of signal controllers planned to run CV applications by 2020: **TBD**

- Do your current procurement specifications for traffic signal hardware (e.g., controllers) include language for SPM support? **No, but in progress.**

- Do your current procurement specifications for any ITS hardware (including signal controllers) include language for CV application support? **Yes, and more in progress.**

CV Infrastructure Deployment Plan

350+

Miles of equipped freeway and major arterial by 2019

MDOT V2I Applications

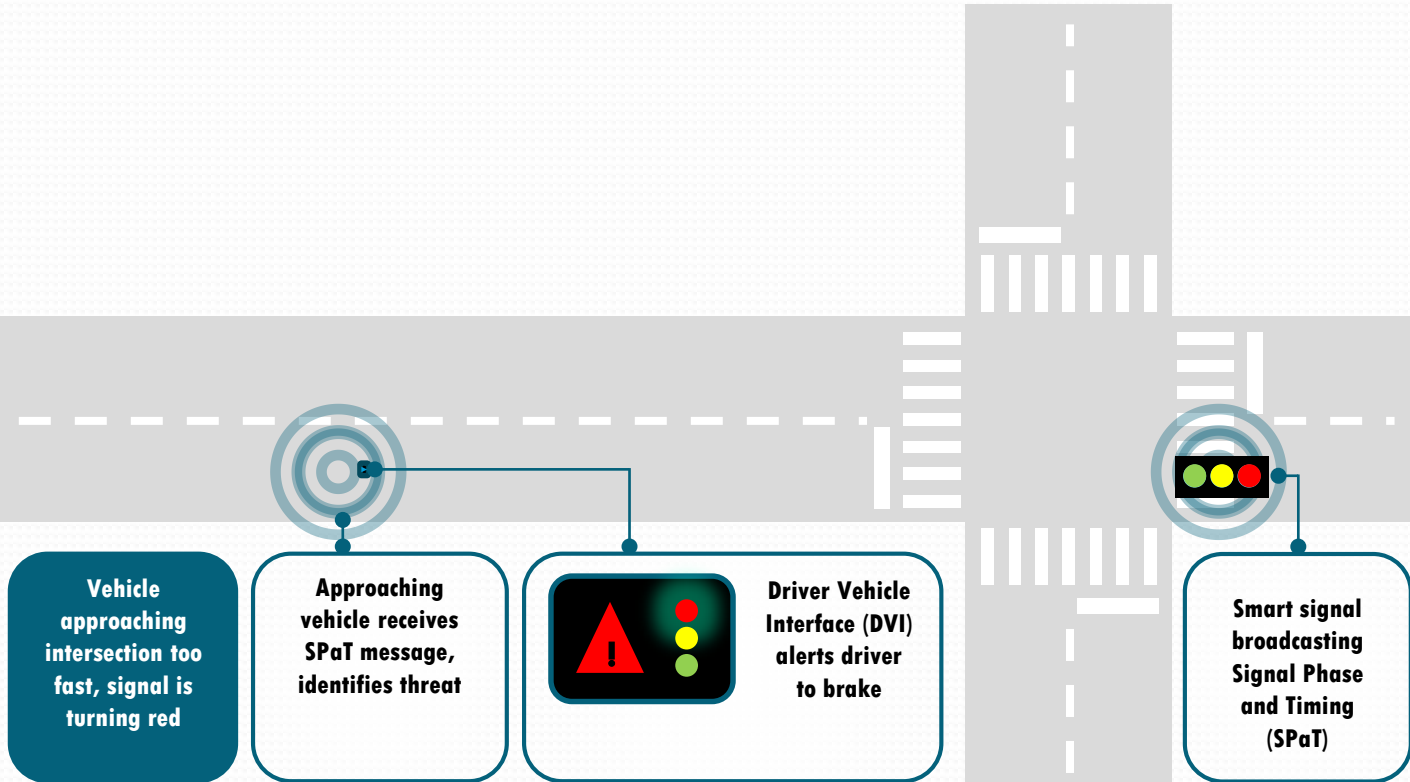**Red Light Violation Warning**

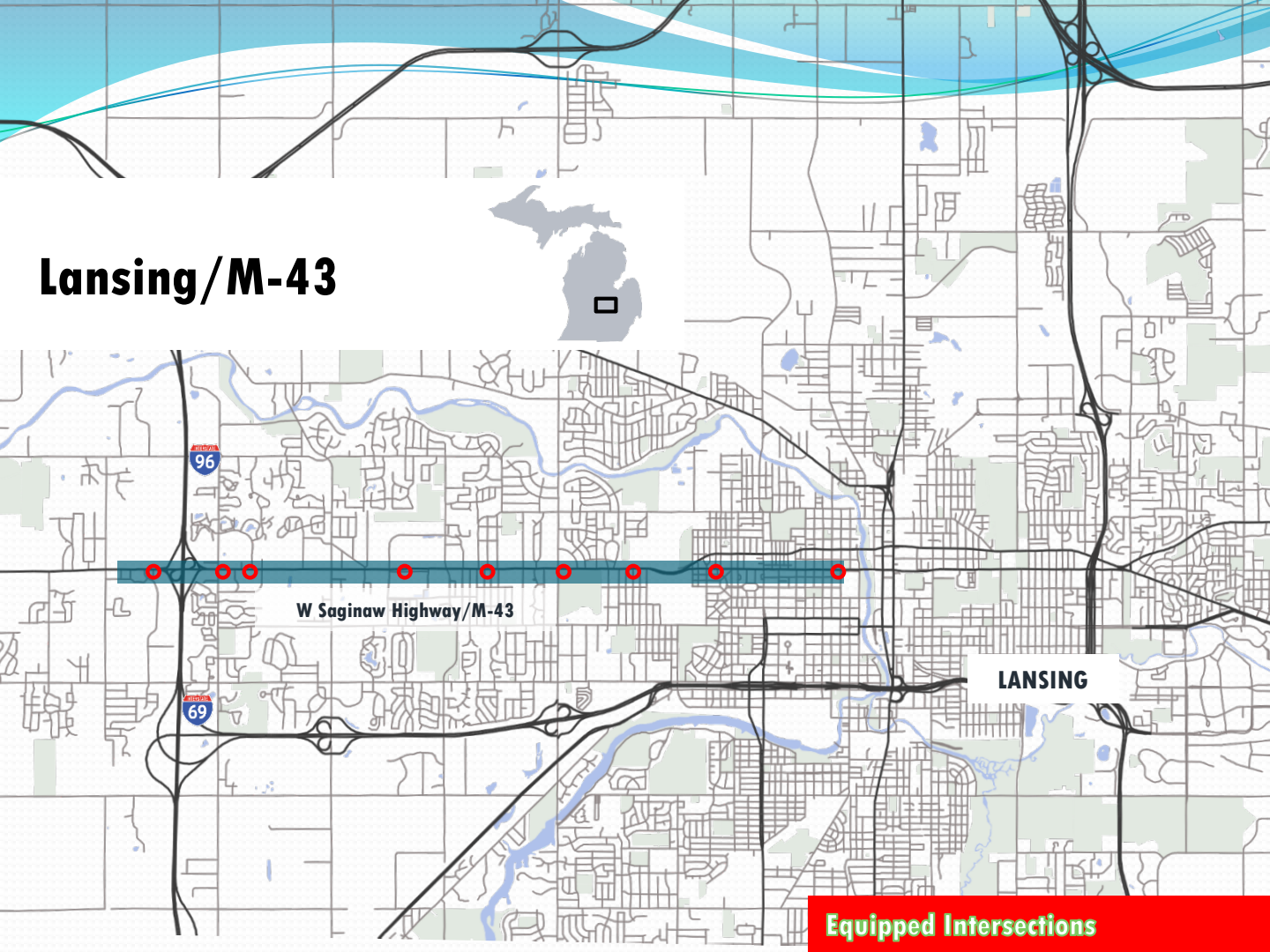**Work Zone Warning/ Management**

Road Weather Management

Pavement Condition

Red Light Violation Warning

Lansing/M-43
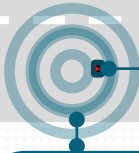
W Saginaw Highway/M-43

LANSING

Equipped Intersections

Work Zone Warning/Mngt.

Portable RSU sends work zone info to vehicle
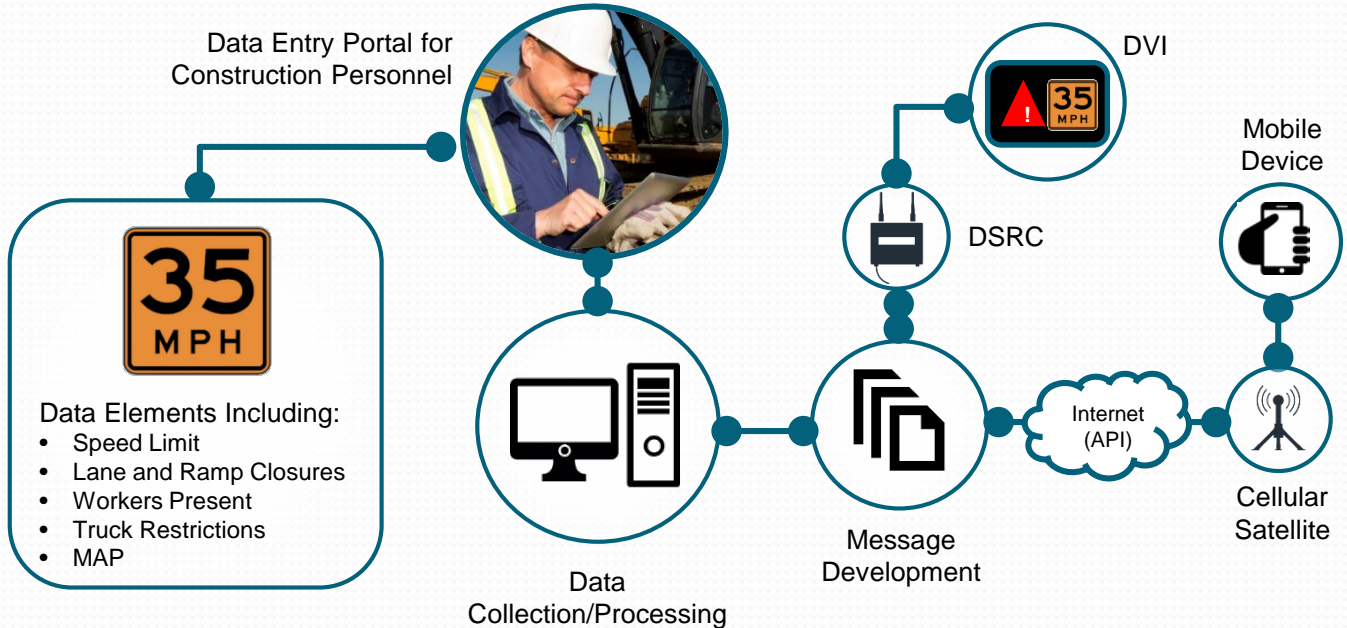
Vehicle is approaching work zone too fast

Approaching vehicle receives message from RSU with work zone information

Driver Vehicle Interface (DVI) provides warning of lane closure

Work Zone Data Input

Data Entry Portal for Construction Personnel

DVI

Mobile Device

DSRC

Internet (API)

Data Elements Including:
- Speed Limit
- Lane and Ramp Closures
- Workers Present
- Truck Restrictions
- MAP

Data Collection/Processing

Message Development

Cellular Satellite

DUAP – CV Data Use

- **Traditional System**
  - Winter MDSS
  - Mobility (HERE)
  - NWS Warnings/Radar
 - Lane Closures and Restrictions (LCAR)

- **Fixed ITS**
  - ATMS (CCTV, DMS, MVDS counts)
  - Road Weather Information System (RWIS) Stations
  - National Weather Service (NWS) Stations
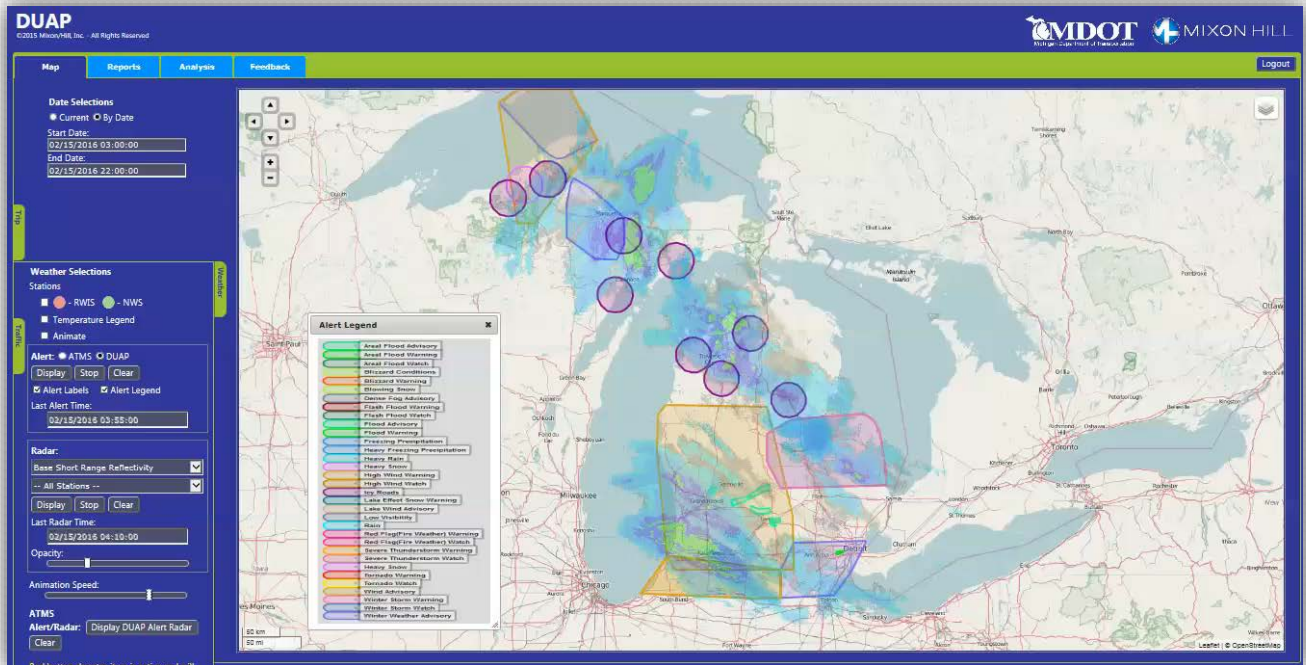
- **Mobile (Connected Vehicle)**
  - Integrated Mobile Observations (IMO) Project Fleet
  - Vehicle-Based Information and Data Acquisition System (VIDAS)
  - Safety Pilot Model Deployment Project Fleet
  - MDOT Automatic Vehicle Locator (AVL)
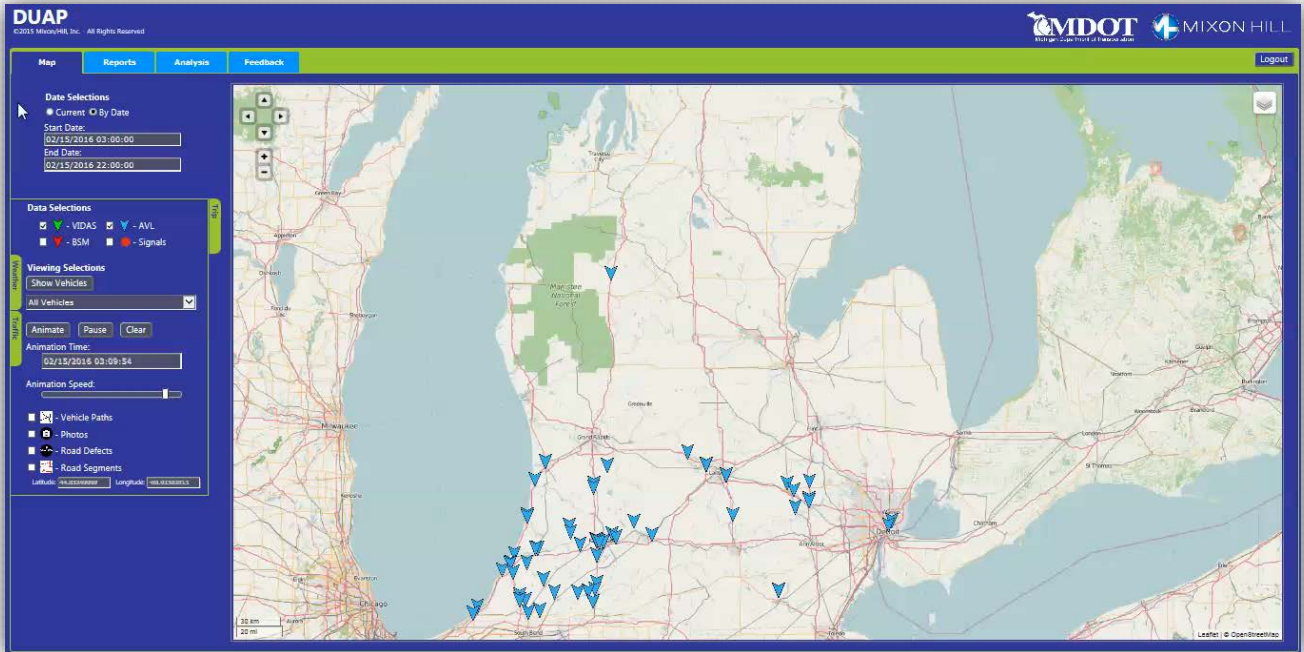
- **Other Future Data**
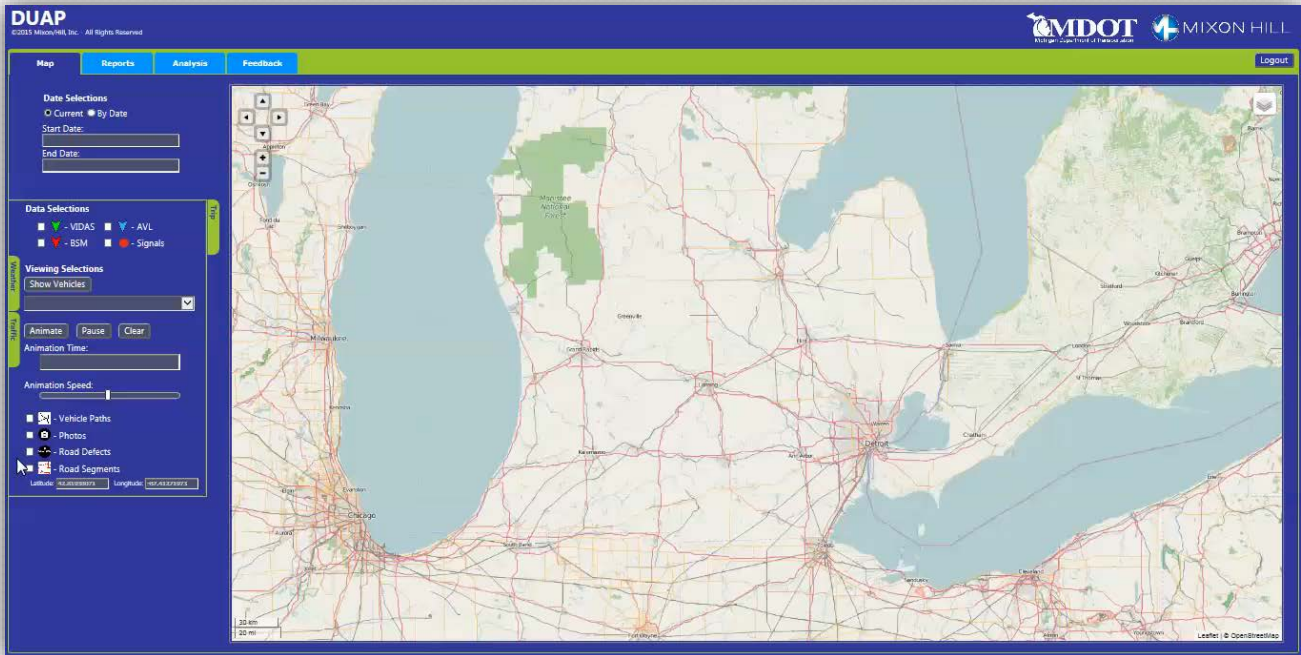 - Construction
  - Maintenance
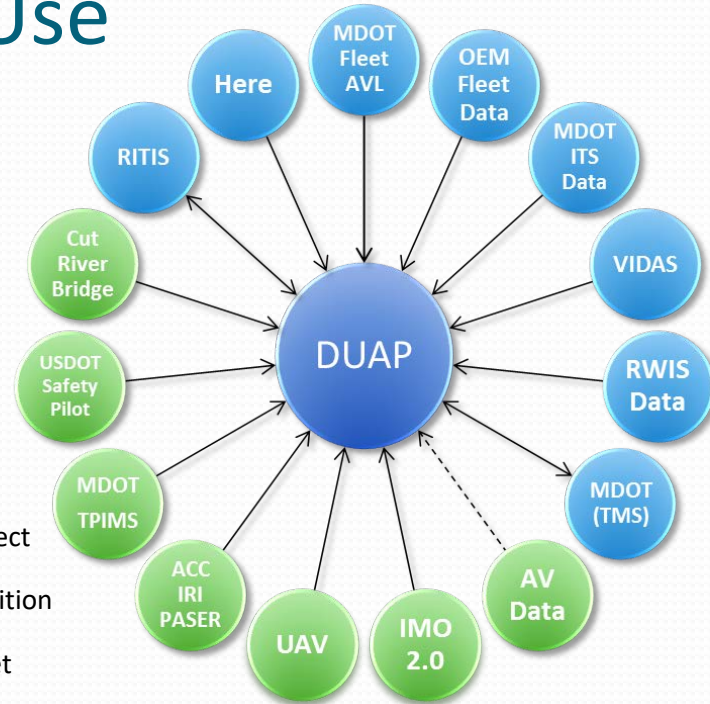
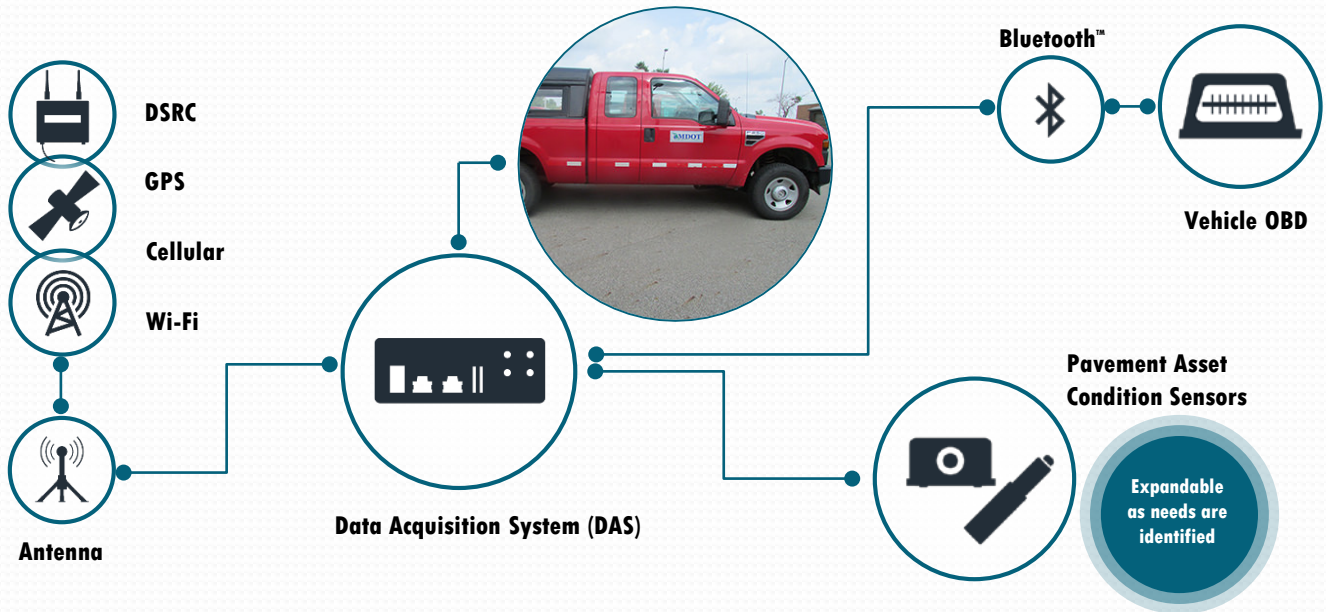# Weather Responsive Traveler Info (WxTINFO)

Winter Maintenance Trucks Data

Pavement Defect Detection

MDOT Fleet Deployments

DSRC

GPS

Cellular

Wi-Fi

Antenna

Data Acquisition System (DAS)

Bluetooth™

Vehicle OBD

Pavement Asset Condition Sensors

Expandable as needs are identified

Questions

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