Michigan DOT
Automated Vehicle Support Activities

Collin Castle (MDOT)

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Connected Automation for Greatest Benefits

Autonomous Vehicle
Operates in isolation from other vehicles using internal sensors

Connected Vehicle
Communicates with nearby vehicles and infrastructure

Connected Automated Vehicle
Leverages autonomous and connected vehicle capabilities
Michigan Traffic Fatalities

Michigan Traffic Fatalities

Year

Fatalities


Infrastructure Support of Automated Vehicles

- Digital Infrastructure
  - Surveying / Digital Mapping
  - Vehicle-to-Infrastructure Connection
    - SPaT
    - Traveler Info
    - V2I Applications

- Physical Infrastructure
  - Pavement Markings
  - Roadway Signage
  - Geometric Design

- Regulatory Frameworks
  - Senate Bills/Public Acts
MICHIGAN FOCUS AREAS

1. Infrastructure
2. V2I Applications
3. Data Management
4. Partnerships
5. Talent Development
Southeast Michigan Connected Vehicle Assets

Infrastructure

Connected Vehicle Environment
Connected Vehicle Test Beds
Tier 1 Automotive Suppliers
Major OEM Facilities
MDOT Roadway ITS Coverage
MDOT is creating partnerships and investing in piloting V2I applications.

The most appropriate form(s) of communication were considered for each application.

Applications were selected based on assessment of various criteria.

- Public benefit
- Agency benefit
- Industry need/use
- Application readiness
- Data availability

- DSRC
- Cellular
- GPS
- Wi-Fi
Initial Pilot Applications

- Red Light Violation Warning
- Work Zone Warning/Management
- Road Weather Management
- Pavement Condition
V2I Applications

Red Light Violation Warning

Vehicle approaching intersection too fast, signal is turning red

Approaching vehicle receives SPaT message, identifies threat

Driver Vehicle Interface (DVI) alerts driver to brake

Smart signal broadcasting Signal Phase and Timing (SPaT)
V2I Applications

Road Weather Management

- Driver reduces speed in response to warning
- Approaching vehicle receives message of road ice in area from RSU and/or cellular network
- Driver Vehicle Interface (DVI) example
- Road weather station detects icing conditions, reports conditions to weather office
V2I Applications

Work Zone Warning/Management

- Vehicle is approaching work zone too fast
- Approaching vehicle receives message from RSU with work zone information
- Driver Vehicle Interface (DVI) provides warning to slow down!
- Portable RSU sends work zone info to vehicle

Driver Vehicle Interface (DVI) provides warning of lane closure!
V2I Applications

Pavement Condition Monitoring

Vehicle drives over pothole in pavement

Sensors in vehicle detect sharp acceleration at point of pothole strike, store data

Maintenance vehicle broadcasts data via cellular network, sends message to nearby roadside unit

MDOT receives data from that vehicle (and others), dispatches maintenance crew

Roadside unit sends pothole data to operations center

Heat map of pavement conditions
MDOT's Data Use Analysis and Processing (DUAP) program is pioneering the collection and fusion of CV data with a wide range of data sources.
Partnerships

Mobility Transformation Center (M-City)
A non-profit testing and product development facility, designed to enable safe validation of CAV technology, and accelerate the development of voluntary standards.
Partnerships

American Center for Mobility (ACM)

- Letters of support from ~40 companies
- $20M Funded from MI Strategic Fund
- Schedule of Activities:
  - Property Purchased: November 4, 2016
  - Ground Breaking: November 21, 2016
  - Test Environment & ITS Design Work: Underway
  - USDOT AV Proving Grounds Designation: January 17, 2017
  - Opening Highway Loop: Planned Winter 2017
AV Legislative Actions: MI Senate Bills

Legislation Introduced by Senators

• Mike Kowall (R-White Lake)
• Rebekah Warren (D-Ann Arbor)
• Ken Horn (R-Frankenmuth)

Signed into Law by Governor Snyder

Led the way to opening Michigan up for the business of automated vehicles
Public Act No. 332
Mike Kowall (R-White Lake), Primary Sponsor

Putting AV’s on the Road

Eliminates “test only” restriction

Allows driverless operation on public roads at any time
Public Act No. 332
Mike Kowall (R-White Lake), Primary Sponsor

Open for Transport

Platooning of commercial vehicles

Supporting the military, large shipping or logistics companies
Public Act No. 332
Mike Kowall (R-White Lake), Primary Sponsor

A New Way to Ride

Automated vehicle networks connected to consumers

Creates array of travel options for consumers
Public Act No. 332
Mike Kowall (R-White Lake), Primary Sponsor

State of Michigan Support

Council on Future Mobility reports to the legislature annually on new laws or regulations

What new policies would help enhance safety, mobility and the state’s economy through this technology
Public Act No. 333

Mike Kowall (R-White Lake), Primary Sponsor

Supports Manufacturers

Provides specific standards for SAVE projects

Vehicle networks started and controlled by vehicle manufacturers
Public Act No. 334
Rebekah Warren (D-Ann Arbor), Primary Sponsor

World Class Destination

Creates the American Center for Mobility (ACM)

The mission of the ACM is still evolving and will include vehicle testing in real world conditions
Public Act No. 335

Ken Horn (R-Frankenmuth), Primary Sponsor

Protection for Mechanics

Ensures that a mechanic, acting in compliance, will not be exposed to liability when working on autonomous technology.
Michigan is the global center for automotive technology and development. By establishing guidelines and standards for self-driving vehicles, we’re continuing that tradition.

Governor Rick Snyder
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