Safety Pilot Model Deployment Test

Conductor

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How Model Deployment Supports Connected Vehicle Objectives

- Tests V2V and V2I safety and mobility applications under real-world, multi-modal driving conditions
- Data can be used to determine the effectiveness of the technologies and applications at reducing crashes
- Helps ensure that the devices are safe and do not distract motorist or cause unintended consequences.
Scope

- More than 2,800 vehicles
  - Passenger cars, commercial trucks, transit
- 73 lane-miles of roadway instrumented with 29 roadside-equipment installations
- 1 year of data collection
Parsons Brinkerhoff & HNTB

- **PB** leads infrastructure development
  - Develop and direct infrastructure plan for installations within the City boundaries
  - Works closely with the City of Ann Arbor Public Services Department

- **HNTB** leads outreach
  - HNTB develops infrastructure plan for installations on State properties
  - Works closely with MDOT
Mixon Hill & SAIC

- **Mixon Hill** leads infrastructure data mgmt.
  - Responsible for data collection spec, backhaul, and storage
  - Additional application development based on DUAP2 and VIDAS
  - Works will all partners involved in the infrastructure development

- **SAIC** leads interoperability testing
  - With UMTRI, coordinates all equipment suppliers
  - Conducts lab and field interoperability tests
escrypt, TTI, & AAA

- **escrypt** leads wireless communication security
  - Works with equipment suppliers and during interoperability tests
- **TTI** provides recommendations and preliminary assessments of additional applications to be tested
  - Works closely with UMTRI and infrastructure leads
- **AAA** provides outreach experience and services to the program
  - Works closely with outreach lead and UMTRI
Ann Arbor as the Deployment Site
Ann Arbor as the Deployment Site

- A good mix of high-volume, multi-modal traffic
- Urban, suburban and rural travel
- Significant commuter traffic
- A variety of roadway characteristics
- Weather variation to examine events, applications, and equipment durability
- Proximity to CAMP and suppliers
- Detroit is site of the 2014 ITS World Congress
Infrastructure Installations

- Strategy for site location
  - Capture all traffic operating in Northeast Ann Arbor, and any commuter traffic entering from the North, East, or South

- Roadside Equipment at:
  - 21 signalized intersections
  - 3 curves
  - 5 freeway sites

- 2 SPaT enabled corridors
  - 12 intersections, 6 per corridor
Driver Recruitment in Ann Arbor

- Recruit to maximize vehicle exposure to the site
- Large potential recruitment population
  - City’s population about 114,000
  - 40,000 UM employees (20,000 at UM Hospital)
  - VA Hospital, EPA, etc.
  - High employee retention at rates
- Two trucking firms
  - Con-way Freight and Sysco Foods
- Two transit agencies
  - Ann Arbor Transit Authority and UM Transit
# Vehicles to be Equipped

<table>
<thead>
<tr>
<th>Connected Vehicle Device</th>
<th>Vehicle Type</th>
<th>Vehicle Source</th>
<th>Total Units in Model Deployment</th>
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</thead>
<tbody>
<tr>
<td>Integrated Devices</td>
<td>Light vehicles</td>
<td>CAMP</td>
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<tr>
<td>Integrated Devices</td>
<td>Commercial trucks</td>
<td>Battelle team</td>
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<td>Vehicle Awareness Devices</td>
<td>Light vehicles</td>
<td>UM employees</td>
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<tr>
<td>Vehicle Awareness Devices</td>
<td>Local truck fleets</td>
<td>Con-way, Sysco</td>
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<td>Vehicle Awareness Devices</td>
<td>Light/medium duty</td>
<td>University fleet</td>
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<tr>
<td>Vehicle Awareness Devices</td>
<td>Transit vehicles</td>
<td>AATA, UM buses</td>
<td>100</td>
</tr>
<tr>
<td>Aftermarket Safety Devices</td>
<td>Light vehicles</td>
<td>UM employees</td>
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<tr>
<td>Retrofit Devices</td>
<td>Local truck fleets</td>
<td>Con-way, Sysco</td>
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<tr>
<td>Retrofit Devices</td>
<td>Transit vehicles</td>
<td>AATA, UM buses</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
<td><strong>2836</strong></td>
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</table>
SAFETY PILOT MODEL DEPLOYMENT SITE PLAN: ANN ARBOR, MICH.

- Primary Model Deployment Routes
- University of Michigan Campus/Medical Center (Primary Driver Recruitment Area)
- Proposed Curve Warning Locations
- UMTRI Facilities (Showcase, Facilities, Equipment and Data Storage)
- Roadside Equipment Co-Located with Freeway ITS Installation
- Roadside Equipment Co-Located with Actuated Traffic Signal
- Roadside Equipment/SPaT-Enabled Traffic Signal
- Prototype Solar/Cellular Roadside Equipment Installation

The Safety Pilot Model Deployment includes more than 73 lane-miles of instrumented roadways.
Additional Applications

- USDOT strategic goals of Safety, State of Good Repair, Economic Competitiveness, Livability, and Environmental Sustainability
- MDOT Data Use Analysis and Processing (DUAP) Project
  - Applications that enhance transportation operations
- Vehicle-based Information & Data Collection System (VIDAS)
  - Application of actionable road and weather data
Other Applications Under Investigation

- Emergency vehicle preemption
  - Two hospitals on the SPaT enabled Fuller/Geddes corridor
- Pedestrian/Bicyclist detection
  - Detect pedestrian traffic at instrumented intersections
Program Outreach

- Coordinated effort, involving all team members in cooperation with the USDOT
  - Model Deployment Showcase
  - Printed and Video Materials
  - Industry Publications
  - Public Meetings
  - Technical Papers and Presentations
  - Website
    - http://spmd.umtri.umich.edu
Program Outreach
Stakeholder Utilization of the Site

- Provide access to, and support for, use of the operating environment by other stakeholders
- Showcase facility located at UMTRI to support stakeholder use of the site
  - Displays and video presentations of the applications
  - Driver training facilities, demonstration areas, and a vehicle-based demonstration staging area
  - Demonstration routes for on-road application demonstrations
Stakeholder Utilization of the Site

- Establishing:
  - Registration process
  - Check-in and check-out procedures
  - Rules for use
  - Safety procedures
  - Coordination of competing or conflicting testing
  - Assistance in subject recruitment
  - Vehicle support and facilities
  - Data retrieval
Questions?

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