MEET IN ASIA PACIFIC FOR THE
WORLD’S LEADING TRANSPORT TECHNOLOGY EVENT
ACTIVATING GLOBAL MOBILITY SOLUTIONS
ITS—ENHANCING LIVEABLE CITIES AND COMMUNITIES

2016
MELBOURNE
23rd World Congress on Intelligent Transport Systems
Melbourne Convention and Exhibition Centre
10–14 October 2016
Carl K. Andersen
USDOT Federal Highway Administration

Strategy of Practical Implementation of V-I Cooperative Systems for Traffic Accident Avoidance
Outline

• Analyze Crash Data and Assess Benefits
• Validate Initial Concept
• Develop Guidance and Tools to Support Deployment
• Stimulate Connected Vehicle Deployment
  – Connected Vehicle Pilot Deployment
  – Smart City Challenge
• USDOT Contacts
USDOT Working in Collaborative Partnerships

Pre-crash Scenarios & Crash Types Addressed Through Cooperative ITS

Academia

International Research
USDOT Crash Analysis Reports

- **20th International Technical Conference on the Enhanced Safety of Vehicles Report No. 07-0016**
  - CICAS-V Research on Comprehensive Costs of intersection Crashes

- **FHWA-HRT-11-040**
  - Crash Data Analysis for Vehicle to Infrastructure Communications for Safety Applications

- **DOT-HS-811-381**
  - Frequency of Target Crashes for IntelliDrive Safety Systems

- **FHWA-JPO-11-090**
  - AASHTO Connected Vehicle Infrastructure Deployment Analysis
Findings from One Study

Relationship between Cumulative Number of Signalized Intersections and Cumulative Target Crashes in California

Systems Engineering documents available at www.ntl.bts.gov
Assessment of Safety Applications

- Conducted technical assessment of prioritized list of safety applications
- Three were chosen for development and testing

<table>
<thead>
<tr>
<th>Safety Applications Technical Assessment</th>
<th>Intersection</th>
<th>Speed</th>
<th>Traffic Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop Sign Gap Assist (SSGA)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Red Light Violation Warning (RLVW)</td>
<td>Low/Med</td>
<td>Low</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Curve Speed Warning (CSW)</td>
<td>High</td>
<td>High</td>
<td>Med/High</td>
</tr>
<tr>
<td>Reduced Speed Zone / Lane Closure Warning (RSZW/LC)</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Spot Weather Information Warning</td>
<td>No</td>
<td>Low/Med</td>
<td>Low/Med</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Application Development Attributes</th>
<th>Intersection</th>
<th>Speed</th>
<th>Traffic Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for Infrastructure Component</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cost of Development, Setup &amp; Maintenance</td>
<td>High</td>
<td>Low/Med</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Additional Benefits to the Drivers</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Scalability and Deployability</td>
<td>Low</td>
<td>High</td>
<td>High</td>
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<thead>
<tr>
<th>Project Development &amp; Testing Impact</th>
<th>Intersection</th>
<th>Speed</th>
<th>Traffic Anomalies</th>
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<tbody>
<tr>
<td>Vehicle Component</td>
<td>Low</td>
<td>Med</td>
<td>Low</td>
</tr>
<tr>
<td>Infrastructure Component</td>
<td>High</td>
<td>Low/Med</td>
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</table>
Development and Deployment

- Enabling Technologies
- Application Prototypes
- ITS and CV Standards
- CV Architecture (CVRIA)
- Certification Processes
- Deployment Guidance
Initial Guidance & Tools Development

V2I Deployment Guidance and Products & Tools
(Complete/Pending Publication)

V2I Planning Tools
(Complete/Pending Publication)

V2I Benefits Tool Framework
(In Progress)
Connected Vehicle Pilot Deployment

- Reduce the number and severity of adverse weather-related incidents in the I-80 Corridor in order to improve safety and reduce incident-related delays.
- Focused on the needs of commercial vehicle operators in the State of Wyoming.

- Improve safety and mobility of travelers in New York City through connected vehicle technologies.
- Vehicle to vehicle (V2V) technology installed in up to 8,000 vehicles in Midtown Manhattan, and vehicle to infrastructure (V2I) technology installed along high-accident rate arterials in Manhattan and Central Brooklyn.

- Alleviate congestion and improve safety during morning commuting hours.
- Deploy a variety of connected vehicle technologies on and in the vicinity of reversible express lanes and three major arterials in downtown Tampa to solve the transportation challenges.
Connected Vehicle Pilot Deployment

Phase 1: Concept Development (COMPLETE)
- Creates the foundational plan to enable further design and deployment
- Progress Gate: Is the concept ready for deployment?

Phase 2: Design/Deploy/Test (CURRENT PHASE- began September 1, 2016)
- Detailed design and deployment followed by testing to ensure deployment functions as intended (both technically and institutionally)
- Progress Gate: Does the system function as planned?

Phase 3: Maintain/Operate
- Focus is on assessing the performance of the deployed system
- Post Pilot Operations (CV tech integrated into operational practice)

For More Information
- Visit Program Website for Updates: [http://www.its.dot.gov/pilots](http://www.its.dot.gov/pilots)
- Contact: Kate Hartman, Program Manager, Kate.hartman@dot.gov
The Smart City Challenge

• Encourage cities to put forward their best and most creative ideas for innovatively addressing the challenges they are facing.

• Demonstrate how advanced data and intelligent transportation systems (ITS) technologies and applications can be used to reduce congestion, keep travelers safe, protect the environment, respond to climate change, connect underserved communities, and support economic vitality.
SMARTCOLUMBUS

Source: SMARTCOLUMBUS
Questions and USDOT Contacts

• Presenter
  – Carl Andersen, Office of Research, Development and Technology, carl.andersen@dot.gov

• Program Contact
  – Deployment Guidance
    Jonathan Walker, PE, Office of Operations, jonathan.b.walker@dot.gov
  – Connected Vehicle Pilot Deployment
    Kate Hartman, ITS Joint Program Office, kate.hartman@dot.gov
  – Smart City Challenge
    Kate Hartman, ITS Joint Program Office, kate.hartman@dot.gov