



The Connected Responder: A Business Case and Plan for the Emergency Responder Community

Presenter Name(s)

Introduction and Orientation

- Participant Welcome
- Presenter Introduction
- Webinar Application Overview

Connected Responder Public Safety and Emergency Response Business Case

- Goals
 - Educate, Influence, and Inspire
- Objectives
 - Educate Emergency Responders as a Catalyst for Change and Innovation



Connected Responder Public Safety and Emergency Response Business Case

Constituents and Stakeholders

- **The Public**
- Transportation Engineers
- Law Enforcement
- Fire Departments
- Towing & Recovery
- Commercial Vehicles
- Fleet Managers
- Public Services
- Emergency Medical Services
- **Our Families**

Practitioner's Orientation to Connected Responder Technologies

- Responders Collaborating with Technology Developers
- Prepare to Evolve




Crawl


Walk

Run

Routinely Dangerous Operations



1 tow truck driver
is killed every six days.

23 highway workers
and

1 law enforcement officer
is killed every month.



6 firefighters are
killed every year.

Move Over for Safety. Every Worker, Every Time.

Graphic from the Ohio Department of Transportation reflecting national statistics on work zone fatalities



Routinely Dangerous Operations

- **167** Law Enforcement Officers died in fatal vehicle accidents 2011-2015
- **4,500** vehicle traffic crashes involving ambulances each year
- **47,758** injuries and 579 deaths from work zone crashes in 2013
- **29,989** fatal crashes in 2014

Connected Vehicle Technology Overview

- Show Video - Connected Vehicles: The Future of Transportation (7:22 minutes)

http://www.its.dot.gov/communications/media/15cv_future.htm

- A shorter, edited version is available

Connected Vehicles 101

Key Concepts

- Standards-Based Architecture
- Well Engineered Foundation
- Market Expansion



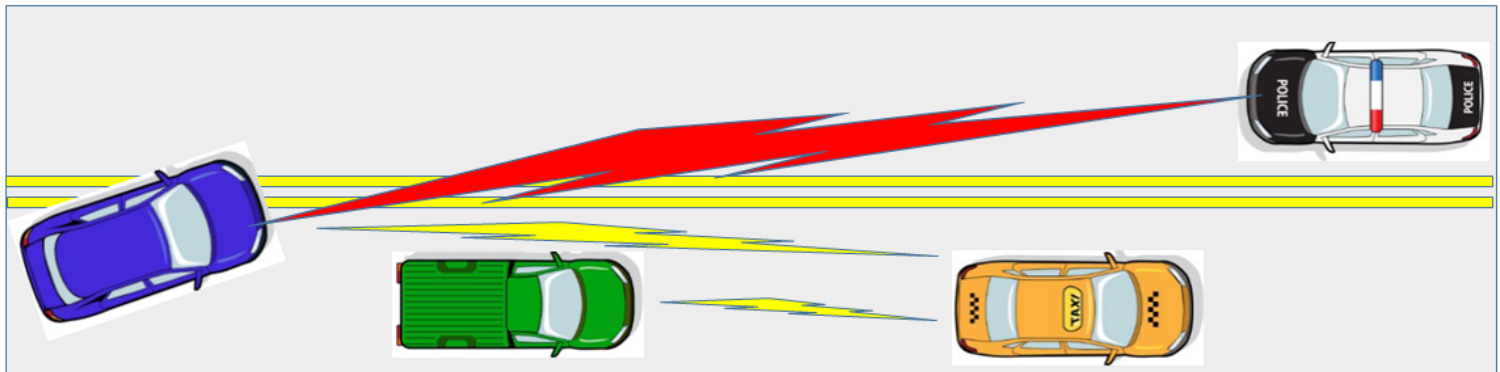
(USDOT, ITSJPO, 2016)

Onboard Unit (OBU) – In-vehicle device transmits and receives Basic Safety Messages 10 times per second – determines if warning is necessary

Basic Safety Message (BSM) – Includes speed, location, and heading

Connected Vehicles Vehicle to Vehicle (V2V) Communications

Application Interface – In-cockpit device which provides warning messages to drivers



OBU from taxi transmits BSM that cab is moving slowly. OBU from blue vehicle transmits BSM that it is changing heading, potentially encroaching into pathway of police vehicle. Application Interface in police vehicle warns that blue vehicle may be encroaching into lane, while application interface in blue vehicle warns that there is an approaching vehicle (police car)



The Basic Safety Message

- Includes position, speed, and heading
- Normally transmitted at 10 times/sec
- Anonymous information
- Vehicles “listen” for other vehicles’ BSMs and continuously analyzes possible crash threats.
- Warnings are issued as needed

Vehicle to Vehicle (V2V) Safety Apps

Near Future

- Blind Spot Warning + Lane Change Warning
- Control Loss Warning
- Emergency Electronic Brake Light
- Emergency Vehicle Alert
- Forward Collision Warning
- Intersection Movement Assist

Mid to Far Future

- Do Not Pass Warning
- Motorcycle Approaching Indication International Icon
- Pre-Crash Actions
- Situational Awareness
- Slow Vehicle Warning International Icon
- Stationary Vehicle Warning International Icon
- Tailgating Advisory
- Vehicle Emergency Response

Vehicle to Infrastructure (V2I) Safety Apps

- Curve Speed Warning
- In-Vehicle Signage
- Oversize Vehicle Warning
- Pedestrian in Signalized Crosswalk Warning
- Railroad Crossing Violation Warning
- Red Light Violation Warning
- Reduced Speed Zone Warning / Lane Closure
- Restricted Lane Warnings
- Signal Preemption/Priority
- Spot Weather Impact Warning
- Stop Sign Gap Assist
- Stop Sign Violation Warning
- Warnings about Hazards in a Work Zone
- Warnings about Upcoming Work Zone

Timeline

1990's
Automated
Highway
System

2003 - Vehicle
Infrastructure
Integration
Initiative

2003 - FCC
allocates
portion 5.9
GHz for
research
purposes

2006 -
ITS/CAMP
V2V research

2011-2014 –
Safety Pilot
Driver
Clinics/
Safety Pilot
Model
Deployment

Timeline

August 2014
– Advanced
Notice of
Proposed
Rulemaking

2016 - Issue
Notice of
Proposed
Rulemaking

2018 - Issue
regulation
mandating
V2V
technology

2019 - 2021 -
Begin phase-
in period for
new car
production

2021-2024
V2V
technology
included on
100% of new
car
production

Proposed Rulemaking

Will require vehicle-to-vehicle (V2V) communication capability for light vehicles (passenger cars and light truck vehicles (LTVs)) and create minimum performance requirements for V2V devices and messages.

Compelling Use Cases (Current Ops with New Tech)

- Multi-Agency Child Abduction Emergency Response
- Connected Fire and Emergency Service Vehicles – Smart Fleet
- Work Zone Safety and Congestion Mitigation
- Interstate HAZMAT Incident Integrated Response
- Evacuation Routing

Key Business Case Drivers for Connected Responders

- Improve Responder and Public Safety
- Reduce Agency Costs (Direct and Indirect)
- Capitalize on Growing Commercial and Private CV Network
- Influence Positive Change for Profession and Public

“NHTSA estimates that safety applications enabled by V2V and V2I could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes, including crashes at intersections or while changing lanes”

Public Safety Strategic Plan Alignment

- Reduce incidents that result in injury, death, and property damage
- Provide timely, effective, and consistent emergency response
- Enhance traffic incident management procedures
- Increase the public's perception of safety

100 strategic
plans reviewed

Law
Enforcement,
Fire, EMS,

State, local,
university, and
tribal agencies

Public Safety Strategic Plan Alignment

- Enhance employee safety
- Manage agency resources effectively
- Improve the efficiency and effectiveness of service delivery by expanding the use of technology

100 strategic
plans reviewed

Law
Enforcement,
Fire, EMS,

State, local,
university, and
tribal agencies

Performance Measures for Connected Vehicle Strategic Goals

- Strategic goals must be measured to determine value and progress
- The Connected Responder report provides specific performance measures

Performance Measures – An Example

- Goal: Provide timely, effective, and consistent emergency responses
- Task: Reduce response times

Performance Measures – An Example

- Measure:
- First Unit on Scene: ___ % of first units arrive on scene arrive within _____ minutes
- Effective Full Response Force: _____% of full response force units arrive on scene within _____ minutes

Performance Measures – An Example

- Goal: Enhance traffic incident management procedures
- Task: Clear incidents faster

Performance Measures – An Example

- Measure:
- _____% decrease in total amount of time from notification of traffic incident that closes or impedes a portion of the roadway to time of roadway reopening
- _____% decrease in total amount of time from notification of traffic incident that closes or impedes a portion of the roadway to full incident clearance

Conducting a Cost Benefit Analysis

- General quantifiable expenses related to motor vehicle incidents
- Compares the total to a general calculation of expense related to the acquisition and management of Connected Vehicle technology.

Conducting a Cost Benefit Analysis

- Assumption of an average lifespan of an emergency responder agency light vehicle of five years. Thus, the calculations evaluate costs over a five-year period.
- Heavier vehicles (EMS and Fire) will have significantly longer life cycles

Intangible Considerations

- Public perception and trust
- Employee morale
- Effect of injury or death from a motor vehicle incident or crash on family members and members of the community
- Availability of equipment

Intangible Considerations

- Lives saved or incidents resolved due to more efficient and timely response
- Lives saved or damage prevented through effective and efficient commercial vehicle enforcement

Intangible Considerations

- Efficiency of rapid traffic incident management and reopening of roadways, including socio-economic implications
- Ability to fully evaluate policies and practices with more comprehensive data including near-miss incidents

Intangible Considerations

- Value of data utilized by other organizations (e.g. traffic engineers, Federal Motor Carrier Safety Administration, National Highway Safety Administration, etc.) to reduce future traffic and motor vehicle crash issues and concerns



Call to Action

- Opportunities for application are limitless
- Become involved in the development of the technologies and associated standards and specifications
- Become a business driver for the vehicle manufacturers to adopt more quickly
- Become early adopters

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Questions

Resources & References

For more detailed information on Connected Vehicle technology for the Emergency Responder:

The Connected Responder – A Business Case for the Emergency Responder Agency and a Business Plan for Engaging the Responder Community

Final Report: Synthesis of Technologies for Emergency Responders

Published by the Transportation Safety Advancement Group
Insert hyperlinks to documents



Resources & References

- [Connected Vehicles: The Future of Transportation \(USDOT\), Video](#)
- [Intelligent Transportation Systems - Joint Program Office](#)
- [ITS America Connected Vehicle Task Force](#)
- [Transportation Safety Advancement Group \(TSAG\)](#)
- [Connected Vehicle Reference Implementation Architecture \(CVRIA\)](#)

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Thank You