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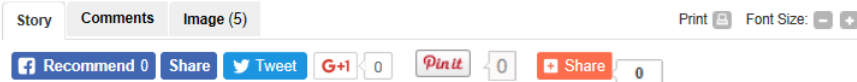
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Routinely Dangerous Operations

- **4,500** vehicle traffic crashes involving an ambulance each year

Wreck kills paramedic who was helping motorists

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Courtesy of Fox 8 WGHP

The scene of an accident that caused the death of a Rockingham County EMS worker on N.C. 14 north of Eden on Wednesday, Jan. 14, 2015.

Posted: Wednesday, January 14, 2015 11:00 pm

By Joe Gamm/News & Record joe.gamm@news-record.com

Updated 11:05 p.m.

GREENSBORO — State troopers charged a Greensboro man in connection with a wreck Wednesday morning in Rockingham County that claimed the life of an EMS captain who was helping motorists.

Louis Cornelius, 58, was charged with misdemeanor death by motor vehicle. He was driving the tractor-trailer that hit and

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

Connected Vehicles Vehicle to Vehicle (V2V) Communications

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

Application Interface – In-cockpit device which provides warning messages to drivers
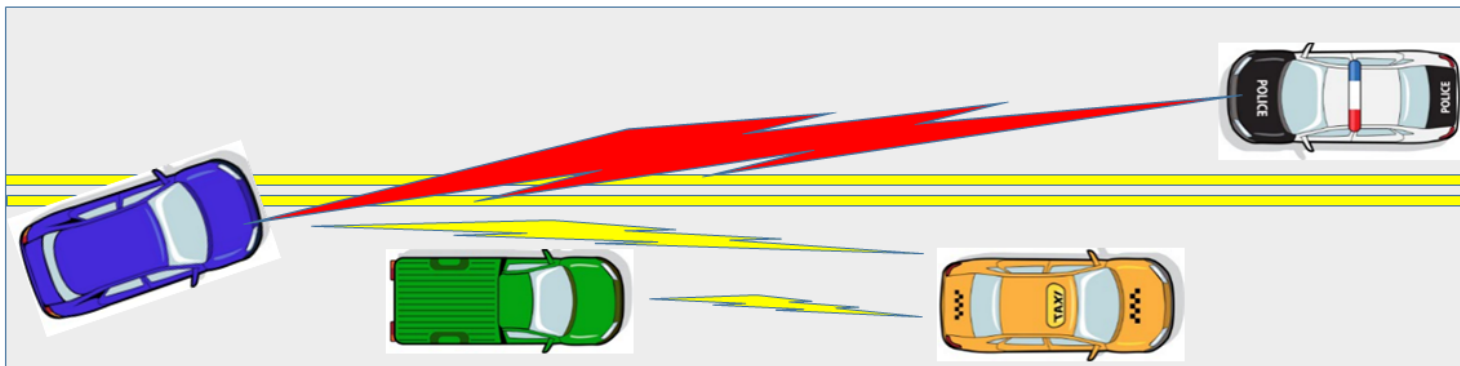
OBU from taxi transmits BSU that cab is moving slowly. OBU from blue vehicle transmits BSM that it is changing heading, potentially encroaching into pathway of police vehicle. Application Interface in police vehicle warns that blue vehicle may be encroaching into lane, while application interface in blue vehicle warns that there is an approaching vehicle (police car)

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

Connected Vehicles Vehicle to Vehicle (V2V) and Vehicle to Infrastrucure (V2I) Communications

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

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

OBUs from ambulance and fire truck transmits BSMs that each vehicle is approaching a controlled intersection (traffic light). The OBU from ambulance also transmits BSM that it is changing heading, potentially indicating that is turning into pathway of police vehicle. Application Interface in both vehicles issue warnings. Additionally, information can be sent to the traffic to prioritize one emergency vehicle over the other for entrance into the intersection.

The Basic Safety Message

- Includes position, speed, and heading
- 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

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.

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

(USDOT, ITSJPO, 2016)

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 delivery of services 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
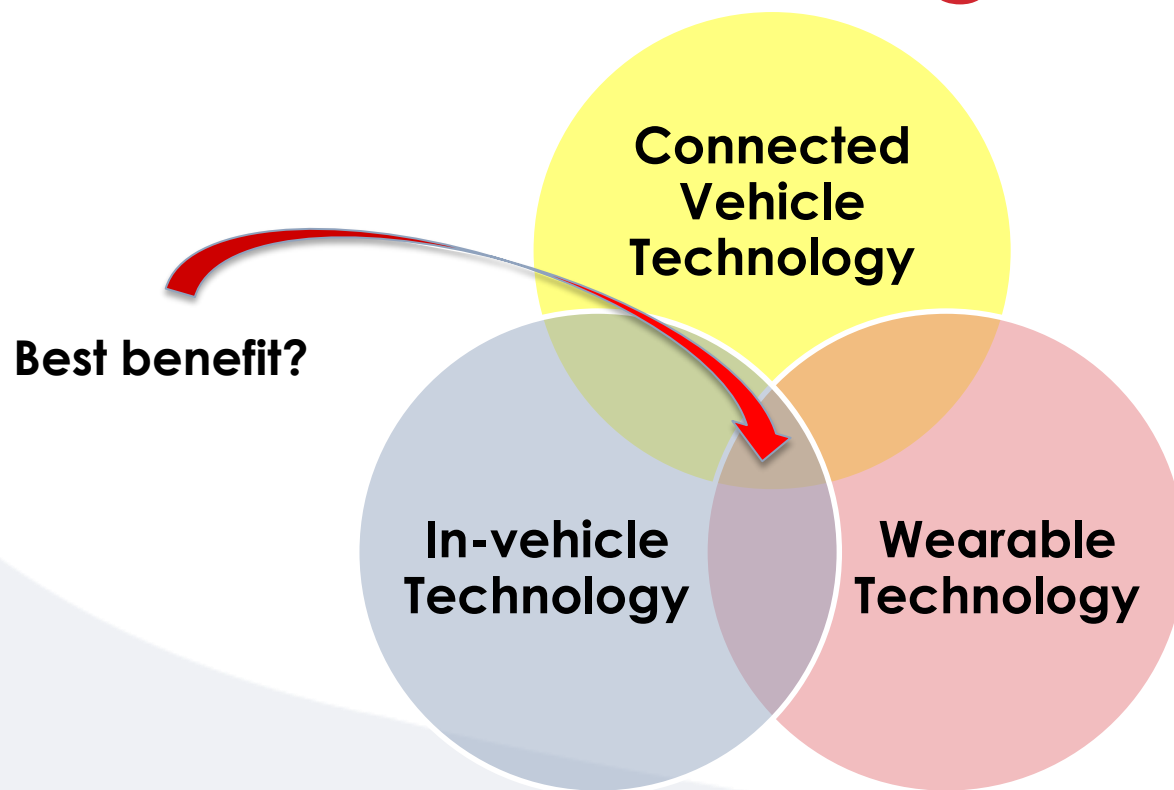
Intangible Considerations

- 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

Synthesis of Technologies for Emergency Responders

Presenter Name(s)

In-vehicle and Wearable Technologies for Connected Responders

- Decode Alphabet Soup (V2V, V2I, V2P)
- Synthesis of Technologies Taxonomy Framework
- Practical Public/Responder Use Cases
- Call to Action

What is a Taxonomy Framework?

Identify New Vehicle or Wearable Technology

Assess the Relevance and Determine the Priority for Stakeholders

Determine Feasibility and Integration Requirements

Taxonomy Framework Example

Intersection Collision Avoidance System

"Shiny Object"

Who (stakeholders), What (capabilities), and Why (operational benefit)

Structured Assessment

When (technology maturity) and How (dependent and integrated technologies)

Rational Analysis

Key Project Deliverables
~*Practitioner Focused*~

- CV Final Report to TSAG

- SOT Final Report to TSAG

- Education and Outreach Tools
  - Presentations (Webinar and Seminar)
  - Practical Use Cases
  - Fact Sheets

- Building Momentum of Influence

Call to Action

- Opportunities for application are limitless

- Consider the immediate environment, but focus on the future

- You, the practitioner, can influence the future direction of these technologies

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)

Thank You