Connected Responder:
A Business Case Primer for Connected Vehicles for Emergency Responders

Joint ITE International and Texas District Annual Meeting July 22, 2019 Austin, TX

Skip Yeakel, P.E. – Outreach Officer
Transportation Safety Advancement Group

Austin 19
Annual Meeting and Exhibit
July 21–24

Connected Responder

Public Safety and Emergency Response Business Case

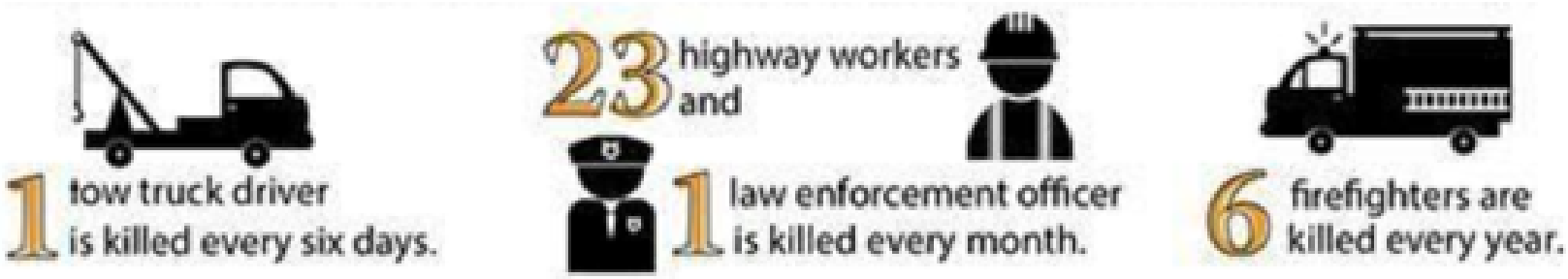
- Goals
  - Educate, Influence, and Inspire
- Objective
  - Educate Emergency Responder Community as a Catalyst for Change and Innovation

Practitioner's Orientation to Connected Responder Technologies

- Responders Collaborating with Technology Developers
- Prepare to Evolve

www.tsag-its.org

Routinely Dangerous Operations



Move Over for Safety. Every Worker, Every Time.

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Routinely Dangerous Operations

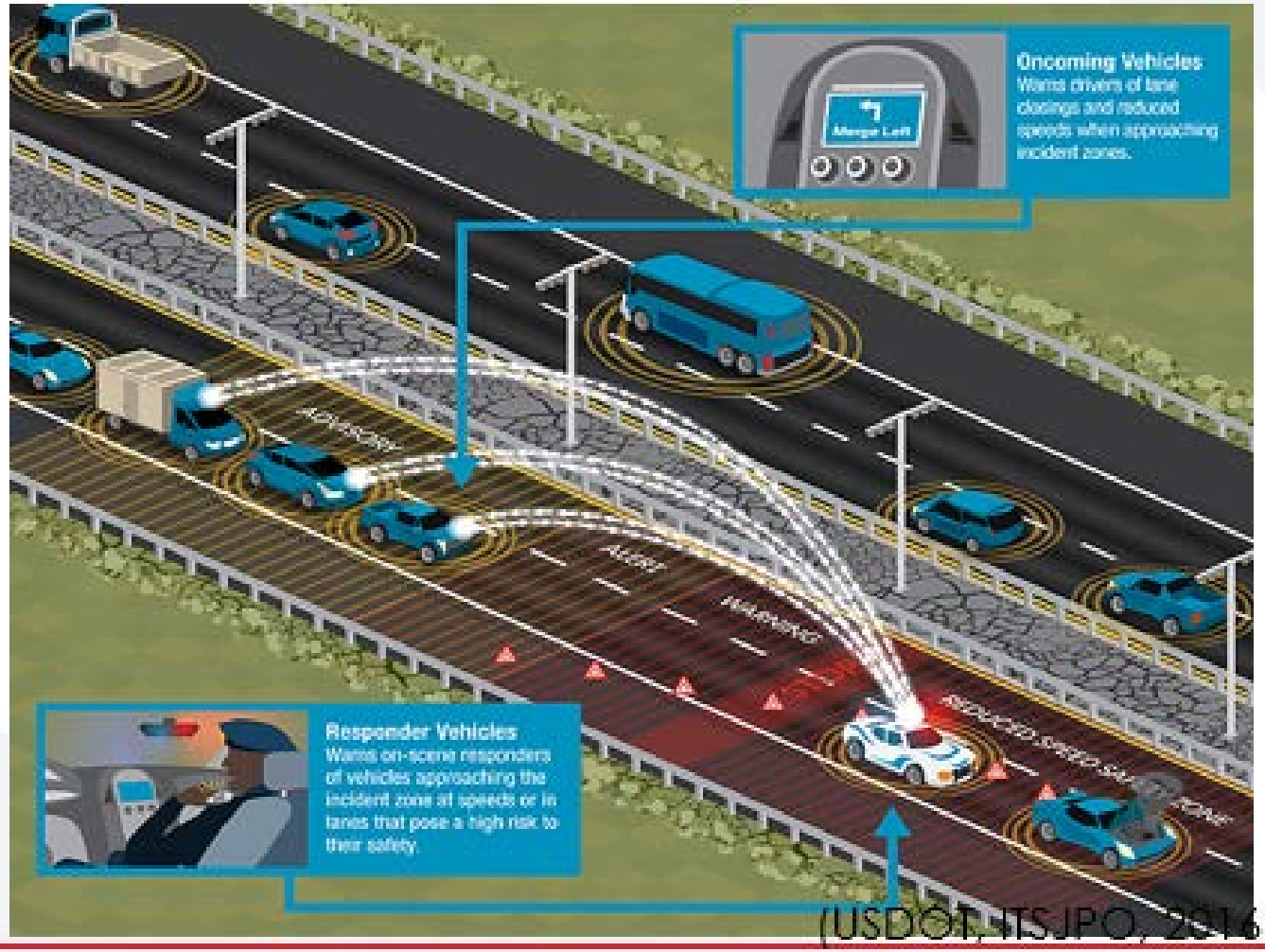
- 167 Law Enforcement Officers died in fatal vehicle accidents 2011-2015
- 4,500 vehicle traffic crashes involving ambulances each year
- 47,758 injuries and 579 deaths from work zone crashes in 2013
- 29,989 fatal crashes in 2014

Connected Vehicle Overview

7:29 US DOT Video for Post-Meeting Study and Review

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Connected Responder 101



(USDOT, ITSJPO, 2016)

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Connected Vehicles 101

Key Concepts

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

(USDOT, ITSJPO, 2016)

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Connected Vehicles
Vehicle to Vehicle (V2V) Communications

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

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)

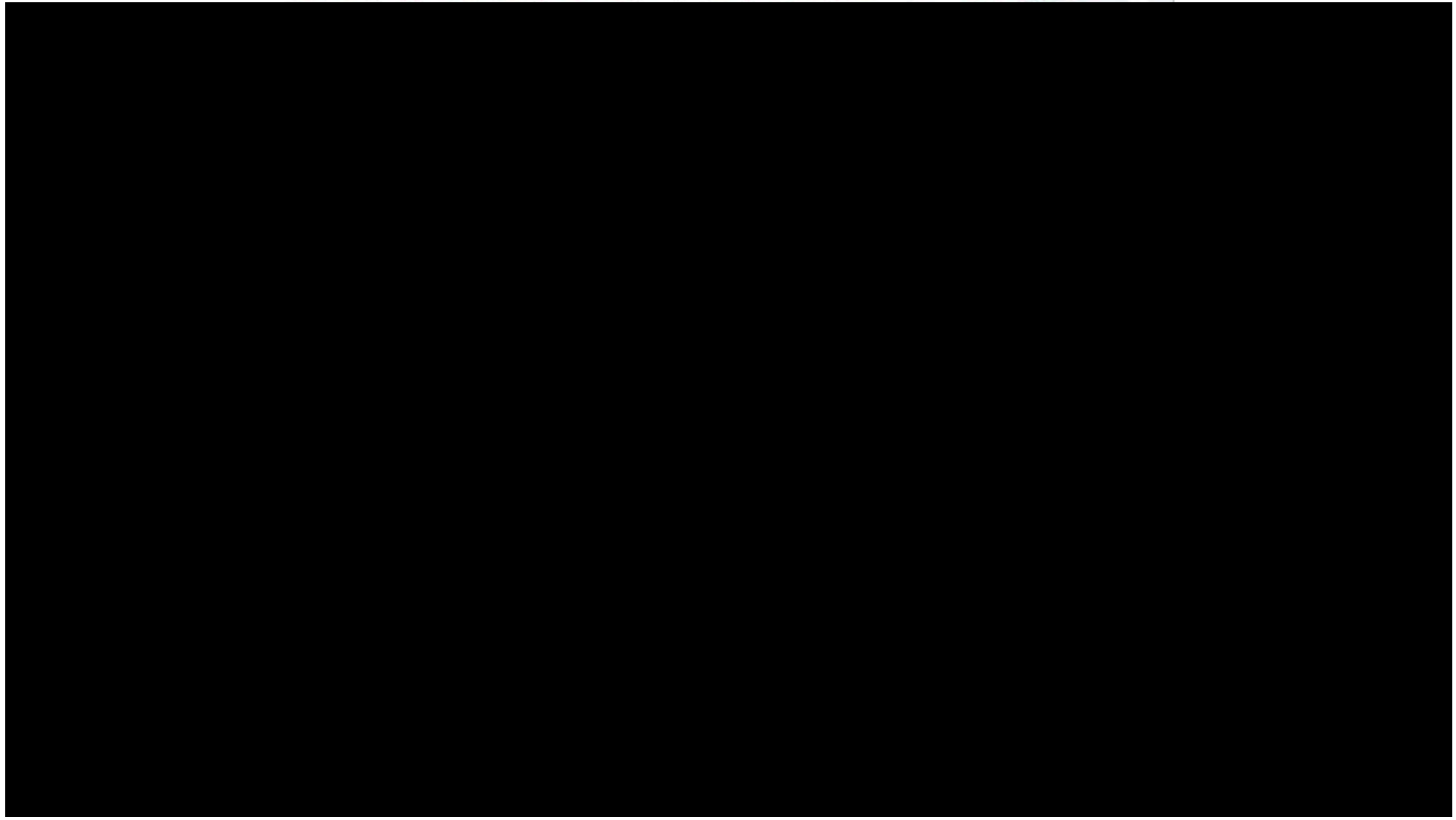
TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Connected Vehicle Demo



TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Benefits of CV Technology

- Reduction of agency involved crashes
- Reduction of citizen vehicle crashes
- Reduction of secondary incidents

"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"

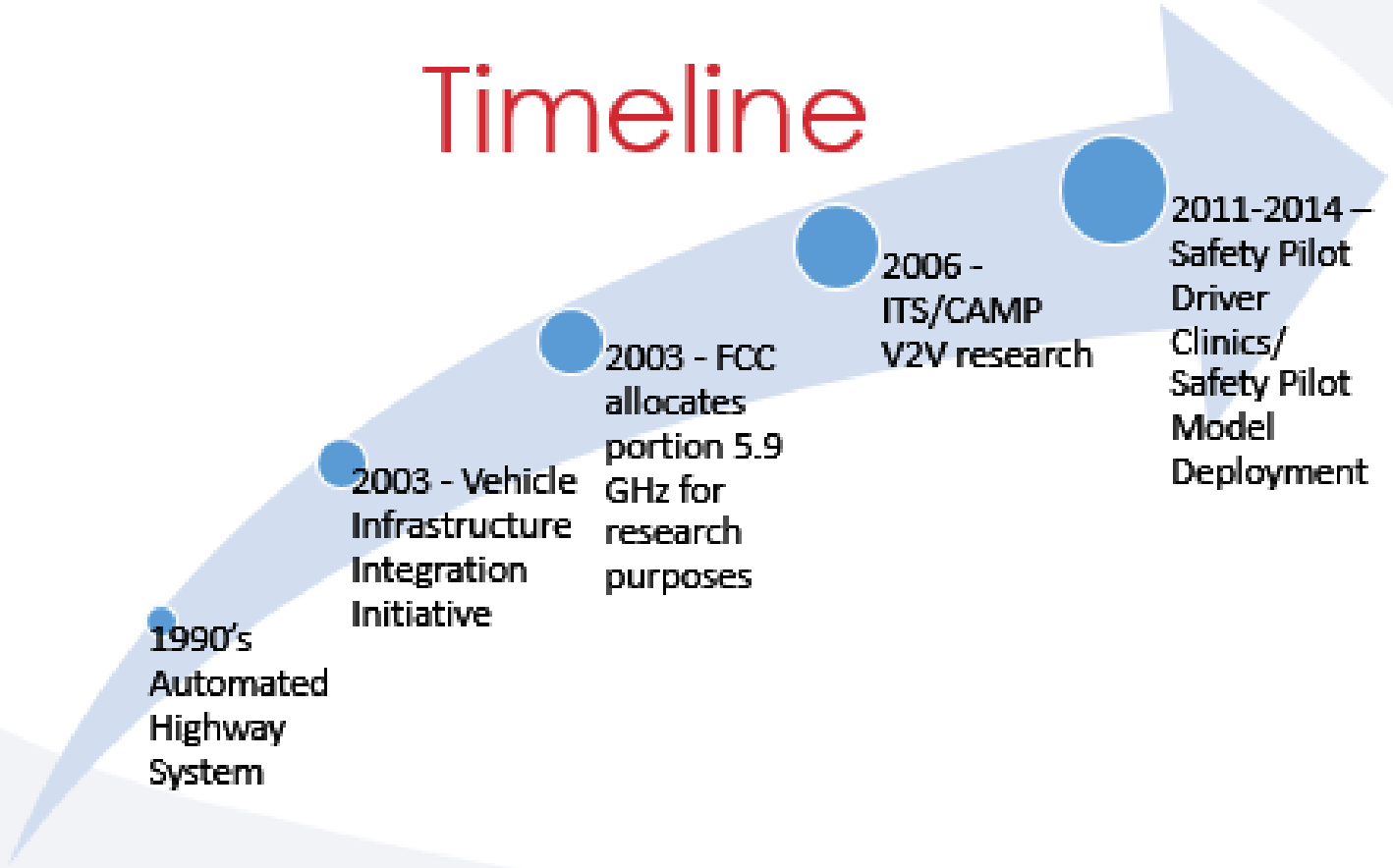
TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

The Emergency Responder In-Vehicle Technology Environment

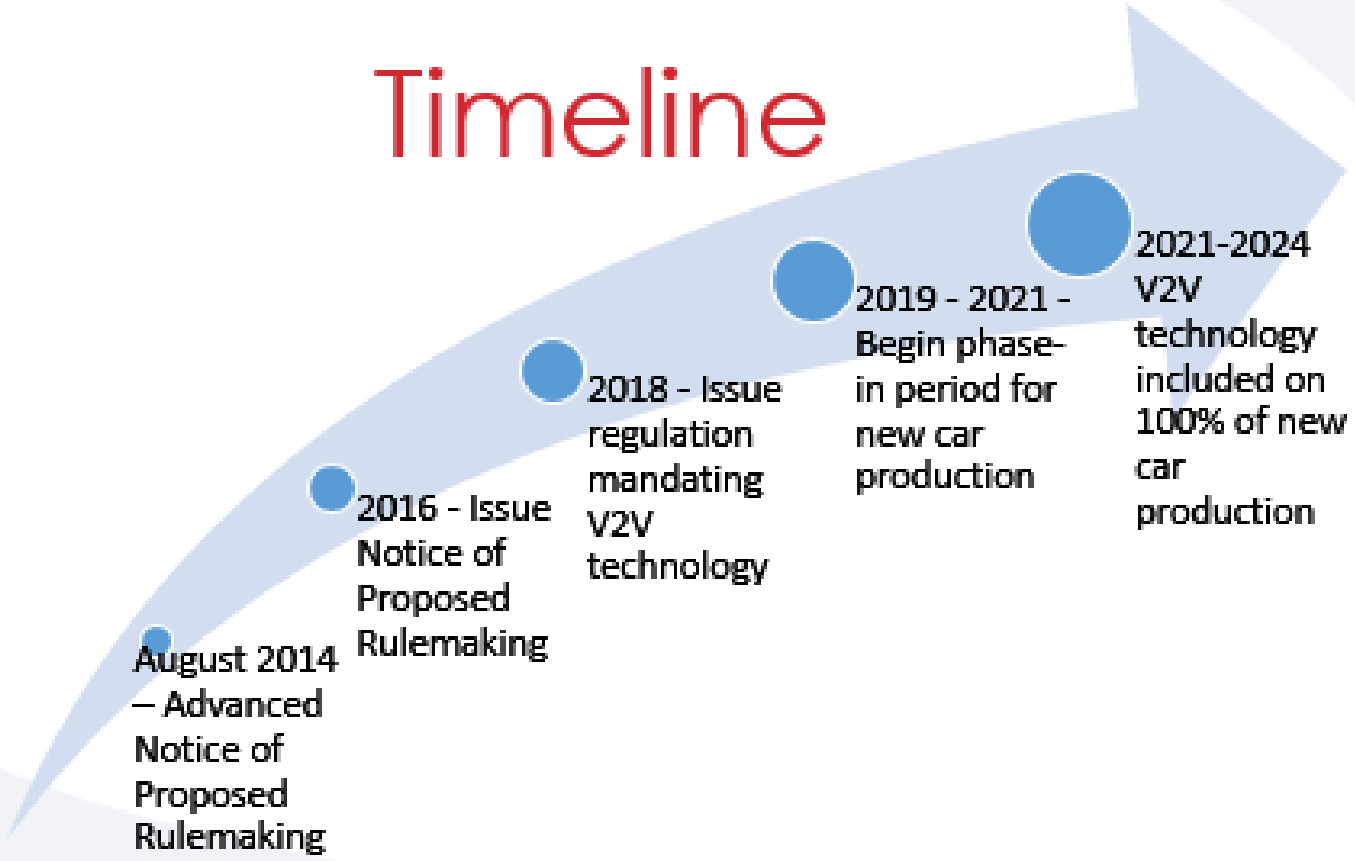
- Safety systems
- Data collection, recording, and dissemination systems
- Limited interoperability with each other vehicle
- Benefits of integration

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Timeline



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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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"

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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.

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

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

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

Full Original Report Reference (within www.tsag-its.org website library):
http://www.tsag-its.org/wp-content/uploads/2018/04/Connected-Responder-Business-Case-Presentation-and-Webinar-12212016.pdf

Resources & References

- Connected Vehicles: The Future of Transportation (USDOT), Video: https://www.its.dot.gov/communications/media/15cv_future.htm
- Intelligent Transportation Systems - Joint Program Office: https://www.its.dot.gov/
- Connected Vehicle Reference Implementation Architecture(CVRIA): http://local.iteris.com/cvria/
- Transportation Safety Advancement Group (TSAG) website: http://www.tsag-its.org/

TSAG
TRANSPORTATION SAFETY ADVANCEMENT GROUP
Promoting Technology for Public Safety

Thank You, "Current Events," and **QUESTION** the Answers ☺

Presenter contact Information:

- **Skip Yeakel, P.E.**

  Principal Engineer

  Volvo Group North America

  7900 National Service Road

  Greensboro, NC 27409

  Skip.Yeakel@Volvo.com