

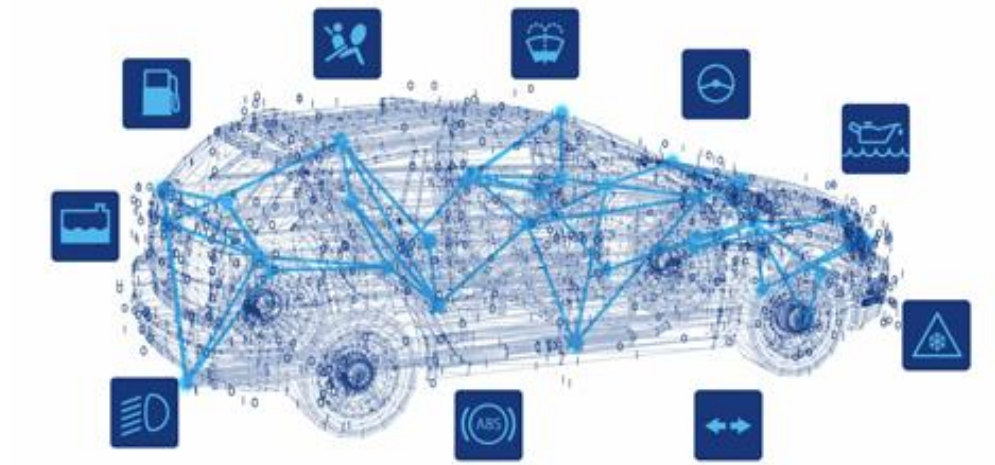
Rural Connected Vehicle Gap Analysis

Preliminary Findings

NRITS Conference
Chattanooga, TN
October 3rd, 2016

OBJECTIVES

- Determine factors impeding deployment of connected vehicles in rural areas
- Provide recommendations to inform rural CV deployment



METHODOLOGY

- Workshop held at NRITS 2015
- Interviews with practitioners

CONNECTED VEHICLE PROGRAM



Image: USDOT

WHAT IS RURAL?

- Traditionally defined by population size
- For CV purposes, important characteristics include:
 - Low traffic volume
 - High travel speeds
 - Varied, remote terrain
 - Heavy freight traffic
 - Resource scarcity



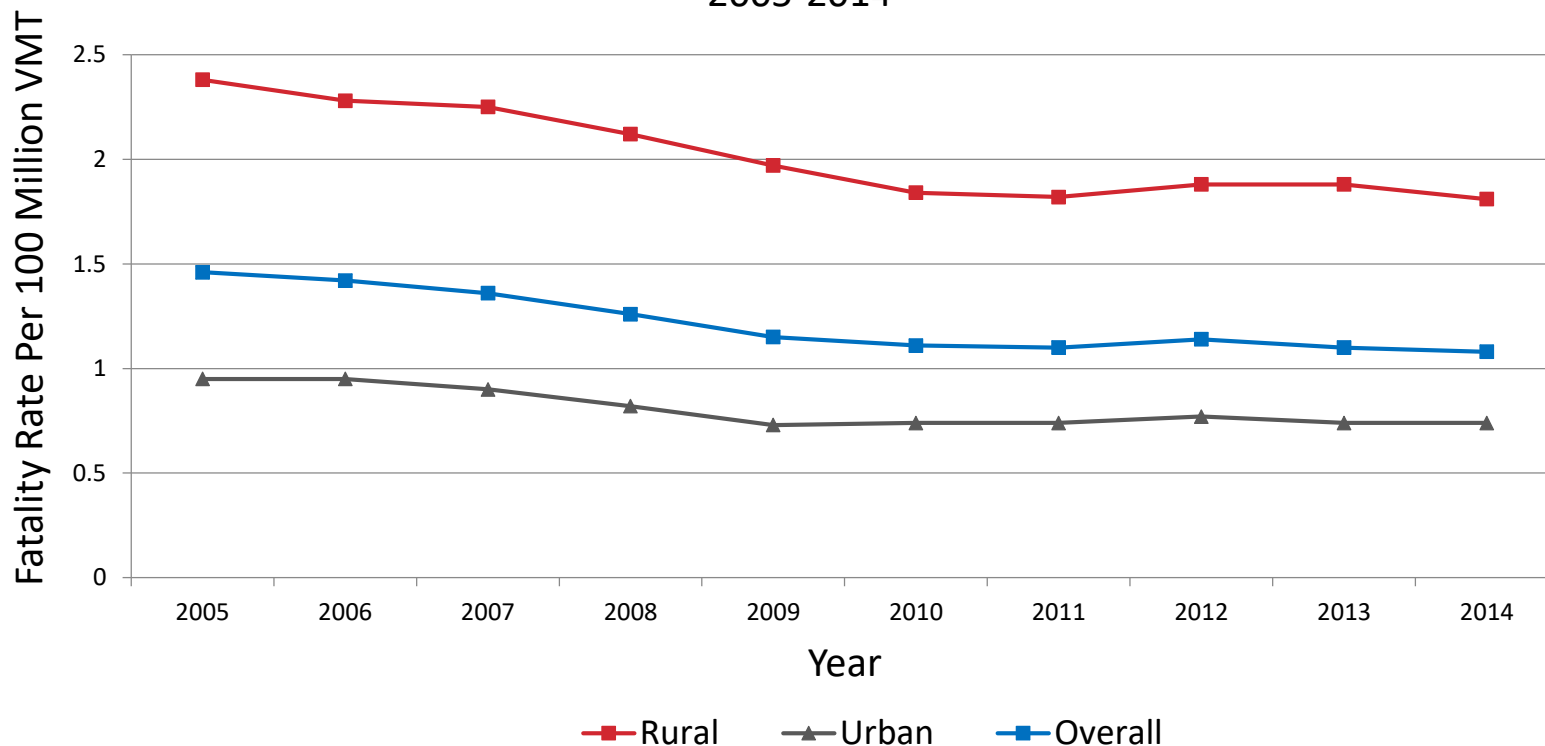
BENEFITS

- Safety
- Road data & operational efficiency
- Incident & event management
- Freight

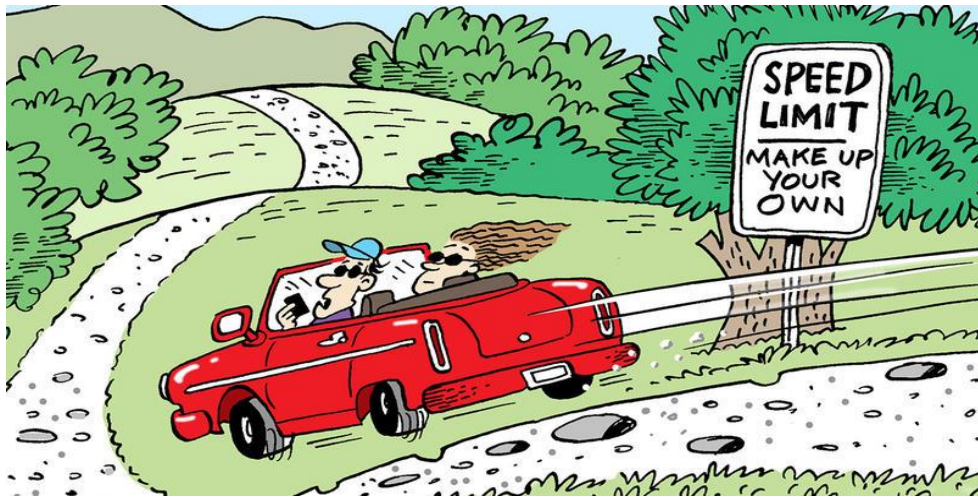
Benefits

SAFETY

Fatality Rates per 100 Million Vehicle Miles Traveled in Rural vs. Urban, 2005-2014



Benefits SAFETY



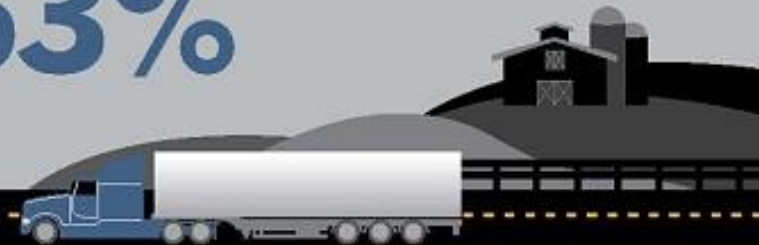
URBAN vs. **RURAL**

37%

63%



of fatal truck accidents occur in
URBAN AREAS



of fatal truck accidents occur in
RURAL AREAS

Benefits

SAFETY

CV Applications:

- Curve Speed Warning
- Work Zone & Queue Warning
- Animal Detection Warning



Benefits

ROAD DATA & OPERATIONAL EFFICIENCY

Problem:

- Currently difficult to collect road and traveler data across large areas
- Equipped vehicles can serve as probes
- Practical and cost-efficient

CV Applications:

- Decision Support Systems (DSS)
- Advanced traveler information
- Targeted maintenance
- Weather warnings



Benefits

INCIDENT & EVENT MANAGEMENT

Problem:

- Longer emergency response times in rural areas
- Non-recurring congestion caused by special events and incidents
- Lack of alternate routes and long closure times

CV Applications:

- CV can provide advanced alternative routing, incident zone warnings, etc.
- R.E.S.C.U.M.E. for emergency responders

Benefits FREIGHT

Problem:

- High percentage of freight traffic on rural roads
- Vulnerable to extreme weather and difficult road conditions



CV Applications:

- CV applications for freight can improve safety and mobility
- Blind spot monitoring, wireless inspection, smart truck parking, platooning
- Weather and road warnings

CHALLENGES

- Difficult to justify investments in CV
- Lack of resources
- Infrastructural challenges
- Cultural barriers

Challenges

DIFFICULT TO JUSTIFY INVESTMENTS IN CV

- Misperceptions of V2V and V2I
 - V2I is not just for congestion!
- Few real-world demonstrations of benefits
 - Wyoming pilot
- General skepticism about DSRC
 - Expensive
 - 5G? Autonomous vehicles? etc.

Challenges

LACK OF RESOURCES

- Funding constraints
- Inability to maintain technological infrastructure
- Workforce

Challenges INFRASTRUCTURE

- Communication & power
- Backhaul
- 5G vs. DSRC

Challenges

CULTURAL BARRIERS

- Lower technology adoption
- Slower vehicle and gadget turnover
- Tendency to be more skeptical of government mandates

RECOMMENDATIONS

- Outreach & education
- Trial deployments
- Innovative approaches to funding
- Communications
- Preparation for the future

Recommendations

OUTREACH & EDUCATION

- Need a dedicated, well-funded outreach campaign to target decision makers and rural communities
- Clearly articulate the improvements possible with CV technology (fewer crashes, better emergency response, weather info, etc.)
- Demonstrate tangible benefits through “Trial Deployments” building on Wyoming Pilot
 - Focusing on freight supply chain can provide quick and significant benefits

Recommendations

TRIAL DEPLOYMENTS

- Show benefits and obtain buy-in by choosing deployment locations with high impact
 - Remote and high speed curves
 - Turns across non-signalized, high-speed intersections
 - Rural signalized intersections
 - Freight routes and rural highways
 - Remote roadways prone to extreme weather
 - High animal collision areas

Recommendations

INNOVATIVE APPROACHES TO FINANCING

- Public-private partnerships (P3s)
 - Leverage freight industry
 - FHWA encourages P3s for transportation improvements
 - Resources:
 - Build America Bureau
 - FHWA Center for Innovative Finance Support
 - FAST Act

Recommendations

COMMUNICATIONS

- Explore dedicated communications network for transportation, along the lines of FAA
 - Could be aligned with National Highway System
- Incentivize telecommunications providers to roll out coverage in rural areas through public-private partnerships

Recommendations

PREPARATION FOR THE FUTURE

- Assess workforce skill needs
- Assess equipment needs
- Identify a 'champion' to lead efforts

CONTACT

COPY OF PAPER:

- Elina Zlotchenko
elina.zlotchenko@dot.gov

FEEDBACK FOR PAPER:

- Radha Neelakantan
rneelakantan@itsa.org