ITS CONNECTED VEHICLE SAFETY PROGRAM

ITS Workshop on Connected Vehicles: Moving from Research Towards Implementation

September 25, 2012
THE PROBLEMS BEING ADDRESSED

Safety
• 32,788 highway deaths in 2010
• 6,000,000 crashes/year
• Leading cause of death for ages 4 to 34

Mobility
• 4,200,000,000 hours of travel delay
• $80,000,000,000 cost of urban congestion

Environment
• 2,900,000,000 gallons of wasted fuel
SOLVING TRANSPORTATION ISSUES THROUGH GREATER SITUATIONAL AWARENESS

Drivers/Operators

Vehicles and Fleets

Connectivity

Wireless Devices

Infrastructure
OPPORTUNITY FOR SAFER DRIVING

- Greater situational awareness
  - Your vehicle can “see” nearby vehicles and knows roadway conditions you can’t see
  - 360 degree “visibility”

- Reduce or even eliminate crashes thru:
  - Driver Advisories
  - Driver Warnings
  - Vehicle Control

Connected vehicles have the potential to address approximately 80% of vehicle crash scenarios involving unimpaired drivers
RESEARCH TOWARDS IMPLEMENTATION
KEY SAFETY PROGRAM OBJECTIVES

- 2013 Decision on Vehicle Communications for Safety (light vehicles)

- 2014 Decision on Vehicle Communications for Safety (heavy vehicles)

- 2015 Infrastructure Implementation Guidance
The DSRC Technology for Safety

- What it is
  - Wi-fi radio product adapted for high speed environment
  - Cheap to produce in quantity

- How the technology works
  - Generates/receives messages at 10 times/sec
    - Basic Safety Message (vehicle size, position, speed, heading, acceleration, brake system status)
  - Operating range of 300 meters (line-of-sight)

- Necessary for crash imminent situations

- Benefits of the technology
  - Reduced Price
  - Less False Alarms → Delayed warnings
  - More Crash Scenarios → Increased performance
    - Can communicate around vehicles and blind intersections

- Drawback of the technology
  - Both vehicles need to be equipped
LIGHT VEHICLE CONSORTIUM

CAMP
Vehicle Safety Communications 3

Mercedes-Benz
Research & Development North America, Inc.

GM

TOYOTA

HONDA
Honda R&D Americas

Ford

NISSAN

HYUNDAI·KIA MOTORS
Hyundai·Kia America Technical Center, Inc.

KIA

VOLKSWAGEN
Group of America

Intelligent Transportation Systems
TEST CONDUCTOR TEAM

UMTRI

Michigan Department of Transportation

Mixon Hill

AAA

escrypt

Embedded Security

Texas Transportation Institute

U.S. Department of Transportation
V2V Safety Framework

Maturing the V2V Research
- Initial Crash Problems
- Performance Measures
- Testing Procedures
- Interoperability Requirements
- Initial Security Models
- Driver Vehicle Interface Guidance

Model Deployment
- Benefits Framework
- Driver Clinics
- Performance Testing
- Model Deployment
- Experimental Design

Evaluation
- Evaluation Plan
- Data
- Conduct Evaluation
- Run Simulations

Supporting Policy Elements
- Implementation
- Technical
- Legal

Moving Towards a Decision
- Safety Benefits
- Performance Requirements
- Test Procedures
- Driver Acceptance

Moving Towards an Operation Model
Data Collection
Data Evaluation & Analysis
Establishing an Operational Environment
Results
“With its potential to save lives and prevent injuries, connected vehicle technology could be a real game-changer for vehicle safety.”

- NHTSA Administrator David Strickland

“The past several decades of auto safety have been dedicated to surviving crashes, but the future will be about avoiding crashes. That is what connected vehicles are all about.”

- RITA Deputy Administrator Greg Winfree

STRONG US DOT SUPPORT AT ALL LEVELS