# 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
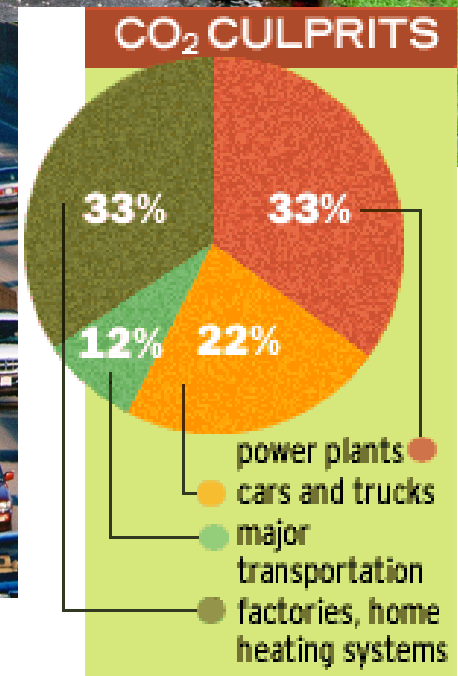- **Leading cause of death for ages 4 to 34**

## 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





CO$_2$ CULPRITS

33%   33%

12%   22%

power plants
cars and trucks
major transportation
factories, home heating systems

# SOLVING TRANSPORTATION ISSUES THROUGH GREATER SITUATIONAL AWARENESS

**Drivers/Operators**

**Vehicles and Fleets**

**Connectivity**

**Infrastructure**

**Wireless Devices**
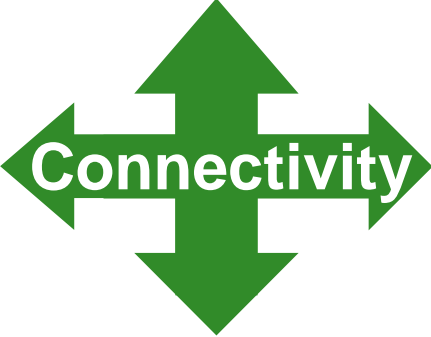
# OPPORTUNITY FOR SAFER DRIVING

- 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

# US DOT OVERSIGHT



U.S. Department of Transportation
Research and Innovative Technology Administration



NHTSA



U.S. Department of Transportation
Federal Motor Carrier Safety Administration



U.S. Department of Transportation
Federal Highway Administration



the VOLPE center



FTA

# LIGHT VEHICLE CONSORTIUM



*CAMP*
*Vehicle Safety Communications 3*

Mercedes-Benz — Research & Development North America, Inc.

GM

TOYOTA

HONDA — Honda R&D Americas

Ford

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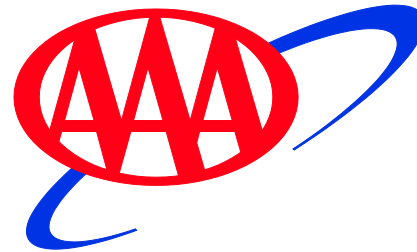
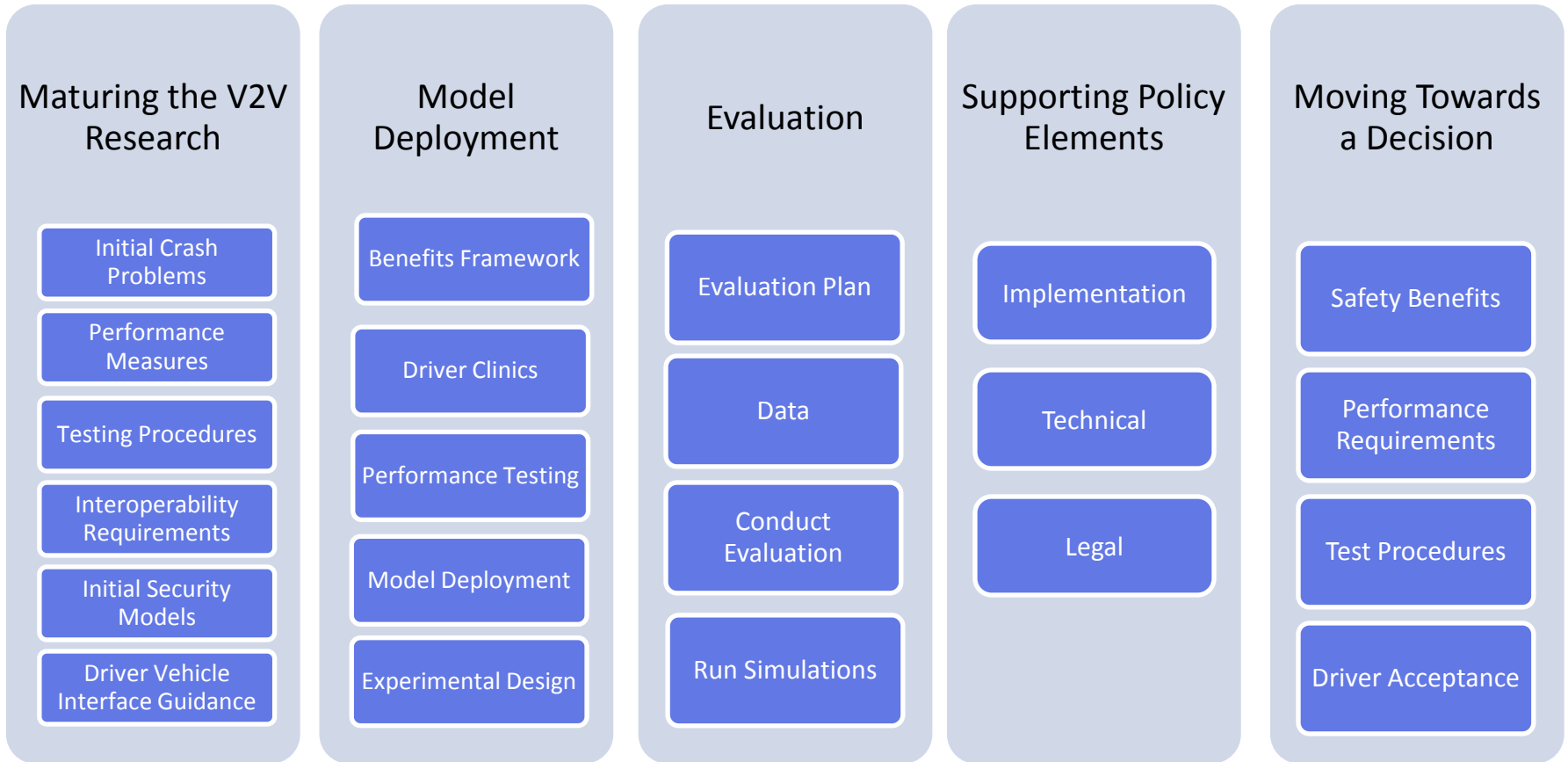HYUNDAI·KIA MOTORS — Hyundai·Kia America Technical Center, Inc.

VOLKSWAGEN — GROUP OF AMERICA

*Intelligent Transportation Systems*

# TEST CONDUCTOR TEAM

# V2V Safety Framework

| Maturing the V2V Research | Model Deployment | Evaluation | Supporting Policy Elements | Moving Towards a Decision |
|---|---|---|---|---|
| Initial Crash Problems | Benefits Framework | Evaluation Plan | Implementation | Safety Benefits |
| Performance Measures | Driver Clinics | Data | Technical | Performance Requirements |
| Testing Procedures | Performance Testing | Conduct Evaluation | Legal | Test Procedures |
| Interoperability Requirements | Model Deployment | Run Simulations | | Driver Acceptance |
| Initial Security Models | Experimental Design | | | |
| Driver Vehicle Interface Guidance | | | | |

Moving Towards an Operation Model → Data Collection → Data Evaluation & Analysis → Establishing an Operational Environment → Results

# STRONG US DOT SUPPORT AT ALL LEVELS



"This research should bring us a step closer to what could be the next major safety breakthrough."

*- U.S. Transportation Secretary Ray LaHood*



"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*