Model Deployment
Overview

John Harding

ITS Connected Vehicle Public Meeting
Moving From Research Toward Implementation

Arlington, VA
September 24-26, 2013
Model Deployment

• Agenda
  – Site
  – Participants
  – Activities
  – Components
  – Accomplishment
  – Continuation
Model Deployment Geographic Area

Key Site Elements:
- 73 miles of instrumented roadway
- 29 roadside units
- ~3000 vehicles
  - Cars, trucks, buses
  - Integrated, aftermarket, and retrofit
- 1 year of data collection

Also:
- Exercising security options
- Vetting device certification process
US DOT

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

NHTSA

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

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.

KIA

VOLKSWAGEN
GROUP OF AMERICA

Intelligent Transportation Systems
TEST CONDUCTOR TEAM
Model Deployment Implementation to Data collection

• August 18, 2011 to August 21, 2012
  – Logistics
  – Experimental Plan
  – Devices & installation
  – RSE Installation
  – Interoperability Testing
  – Security Management
  – Data collection coordination
  – Recruitment & Training
  – Launch

• August 21, 2012 to August 20, 2013
  – Device installations
  – Device monitoring
  – RSE monitoring
  – Security Operations
    • Stage 1 – pre-loaded certificates
    • Stage 2 Over-the-Air certificates
  – Interaction monitoring
  – Data harvests, processing and transfer
VEHICLES & DEVICES DEPLOYED

- 2,362 VADs
- 289 ASDs
- 64 Integrated Light Vehicles
- 19 Integrated / Retrofit Heavy Vehicles
- 3 Retrofit Transit Vehicles
- 26 RSEs

Over 97% of the vehicle fleet has been deployed and is operating in the Model Deployment.
## Safety Application by Devices and Manufacturers

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<th>IMA</th>
<th>LTA</th>
<th>BSW/LCW</th>
<th>DNPW</th>
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**Note:** X indicates the application of the technology.
Data Collection

Data Sources

- CAMP
  - Integrated LV

- UMTRI
  - VAD
  - ASD/DAS
  - CCV-IT
  - RSD – Battelle
  - TRP₂

- Battelle
  - TRP₁

- SWRI
  - RSD - SWRI

- Mixon Hill
  - RSE
  - Traffic
  - Weather
  - Intersections

USDOT Recipients

- Volpe Center
  (Independent Evaluator)

- FHWA – Real-Time
  Data Capture & Mgmt Team

Primary scheme

Secondary scheme
Data

Data Elements

- Numerical
  - In-vehicle data (speed, acceleration, throttle, brake, turn signal)
  - Lane tracking sensor (position within lane, boundary type)
  - GPS (latitude, longitude, maps, road geometry, roadway type)
  - Forward radar (Range, range rate, target type, azimuth angle)
  - Side radar/back spotter (Available maneuvering room)
  - Application data (Alerts, threat level, DVI)

- Video
  - Cameras (front, side, face, cabin)

- Driver Questionnaire

Data Volume

- CAMP/VTTI Integrated Light Vehicle data received up to harvest 9
  - Numerical – 1 TB
  - Video – 16.1 TB

- UMTR data received by July 2013 ASD/DAS, RSD/DAS, Integrated Truck, Motorcycle
  - Numerical – 350 GB
  - Video – 4.12 TB

October 20, 2011
**Interoperability Achieved**

- 3 Stages of Testing Completed
  - Including bench and field testing
- 8 Vehicle manufacturers (CAMP)
- Multiple vendors included
  - Savari
  - Cohda
  - Denso
  - Arada
- Multiple vehicle platforms
  - Light, heavy, and transit vehicles

Interoperability has been achieved across all devices and vehicles participating in the Safety Pilot Model Deployment!
Interactions

Number of Interactions (30m) - Cumulative

Month

Interaction Targets

Observed Interactions

- 990
- 3,796
- 9,410
- 16,030
- 23,700
- 28,704
- 37,486
- 44,942
- 50,088
- 54,281
- 56,541

1 2 3 4 5 6 7 8 9 10 11 12
Continue Data Collection

• 6-month continuation of MD data collection
  – Major activities
    • Continue VAD, ASD, RSD operations
    • Support Transit operations
    • Data collection
      – LV (VADs & ASDs), Heavy Truck RSDs, Buses, Motorcycles, RSEs
    • Maintain RSEs, Complete installation of SPaT on Plymouth Road, Complete installation of 3 hwy. RSEs
    • VAD and ASD device characterization
      – Data collection to understand device installation/configuration aspects and relationship to BSM transmissions.