ITS Program Update
Moving Towards Implementation of Wireless Connectivity in Surface Transportation
Focus on Trucks

Kate Hartman

US Department of Transportation – ITS Joint Program Office

Connected Vehicle Truck Safety Meeting
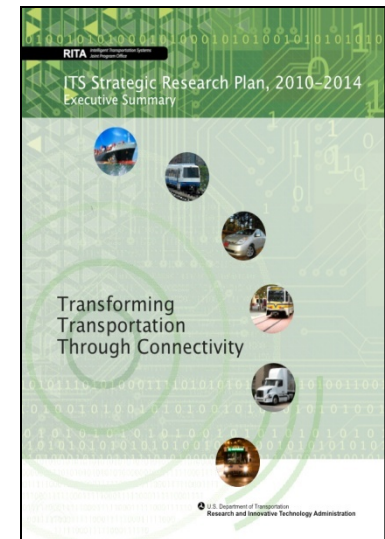
Chicago, IL

August 4, 2011

ITS Strategic Research Plan 2010-2014
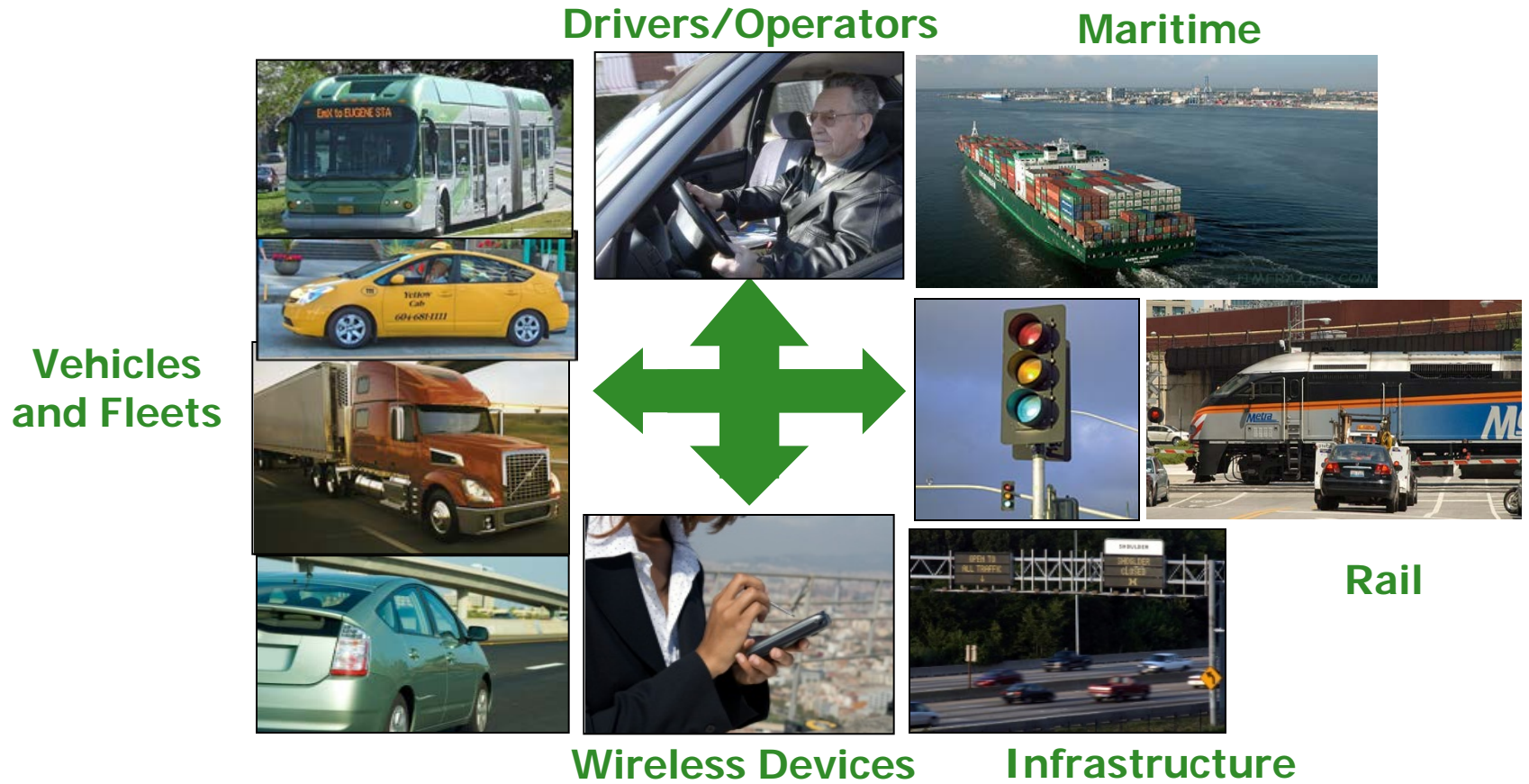# A Truly Multimodal and Connected Effort

Vision

To research and facilitate a national, **multimodal surface transportation system** that features a connected transportation environment around **vehicles of all types**, the infrastructure, and portable devices to serve the public good by leveraging technology to maximize safety, mobility, and environmental performance.
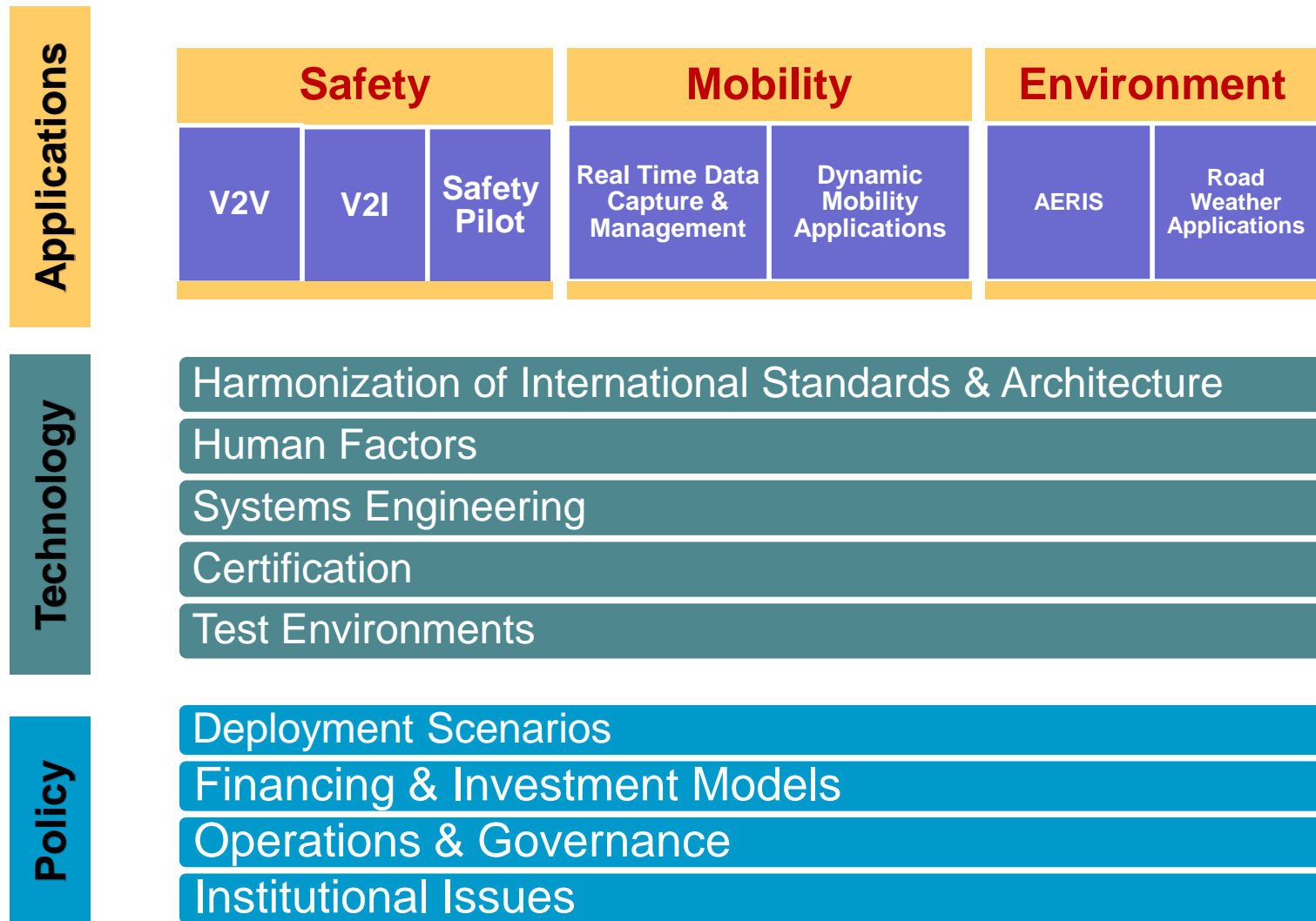
Plan developed with full participation by all surface transportation modal administrations as well as with significant interaction with multi-modal stakeholders.

ITS Research = Multimodal and Connected

Drivers/Operators

Maritime

Vehicles and Fleets

Rail

Wireless Devices

Infrastructure

ITS Research Program Components

Applications

Safety			Mobility		Environment	
V2V	V2I	Safety Pilot	Real Time Data Capture & Management	Dynamic Mobility Applications	AERIS	Road Weather Applications

Technology

- Harmonization of International Standards & Architecture
- Human Factors
- Systems Engineering
- Certification
- Test Environments

Policy

- Deployment Scenarios
- Financing & Investment Models
- Operations & Governance
- Institutional Issues

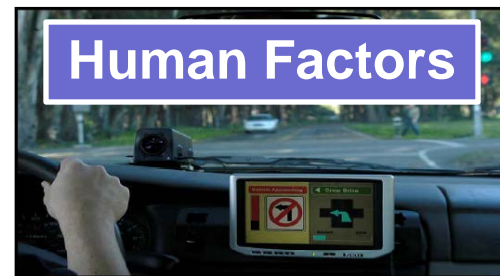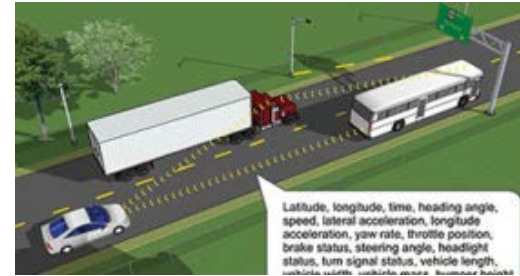**U.S. Department of Transportation**   4

Progress - Step One – Accelerate V to V Safety

- Accelerate Benefits
  - Basic Safety Message Broadcast Devices (Here I am) – Working with 6 vendors (Autotalks, Cohda Wireless, Denso, DGE, ITRI, Savari Networks) (Need a new name for "Here I Am", any thoughts?)
  - ASD – selected 4 suppliers
  - RSE – selected 4 suppliers
- Working on Technical / Policy Tradeoffs for Security
- Working on DVI Guidelines

Latitude, longitude, time, heading angle, speed, lateral acceleration, longitude acceleration, yaw rate, throttle position, brake status, steering angle, headlight status, turn signal status, vehicle length, vehicle width, vehicle mass, bumper height
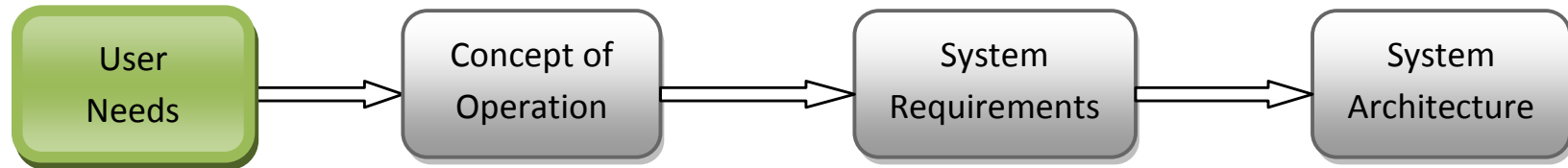

Human Factors

Progress - Step Two - Demonstrate Safety

Safety Pilot

- Test Conductor Procurement is Under Way
- Schedule 6 Light Vehicle Driver Clinics

  1. Aug'11 - Michigan International Speedway (MIS) - Brooklyn, MI
  2. Sep'11 - Minneapolis, MN (MnRoad)
  3. Oct'11 - Orlando FL - Richard Petty Driving Experience
  4. Nov' 11 - Smart Road VTTI – Blacksburg, VA for DAC and
     Washington DC for the demo (RFK or FedEx field)
  5. Dec'11 – Dallas, TX – Texas Motor Speedway (Fort Worth)
  6. Jan'11 – San Francisco - Alameda Naval Air Station

Progress - Step Three – Define the System and Establish a Testing Environment

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┌──────────────┐        ┌──────────────┐        ┌──────────────┐        ┌──────────────┐
│     User     │──────▶ │  Concept of  │──────▶ │    System    │──────▶ │    System    │
│    Needs     │        │  Operation   │        │ Requirements │        │ Architecture │
└──────────────┘        └──────────────┘        └──────────────┘        └──────────────┘
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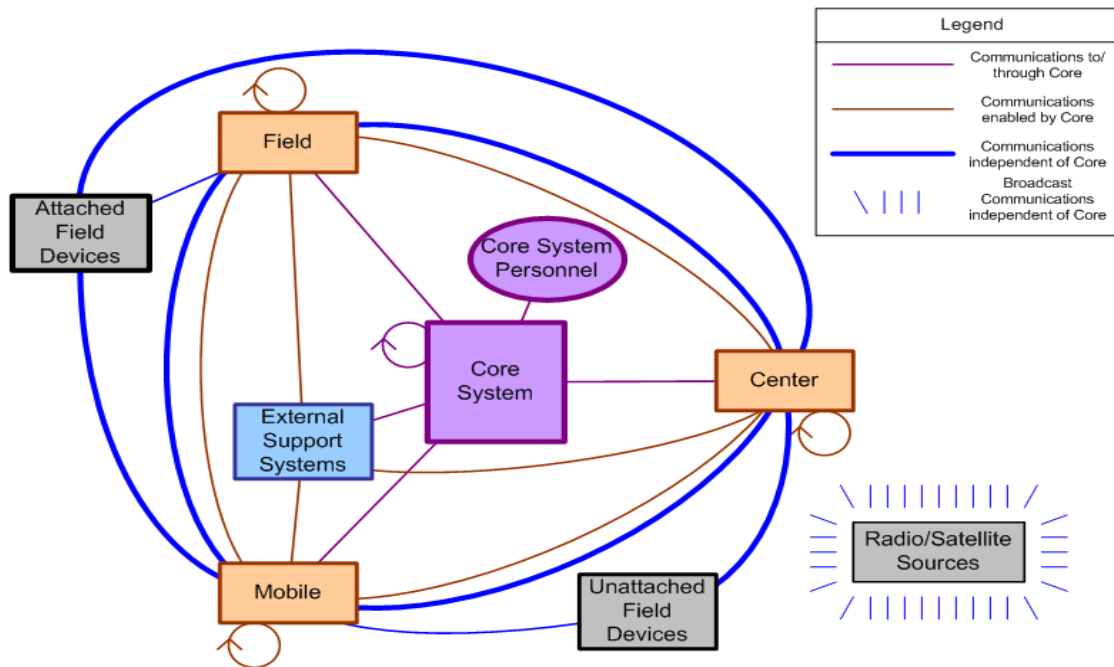
Aug./Sept. 2010   May 2011   September 2011   Oct 2011


connected vehicle environment

Open Workshops
•June 2011 (DC)
•Sep (San Jose, CA)

Progress - Step Four - Build V to I Safety, Mobility, and AERIS Data Environments and Applications

- **V to I for Safety** – Working on V to I Con Ops, Transit Con Ops, Smart Roadside Con Ops and on a SPAT Con Ops
- **MOBILITY – DCM-**Prototype the Data Environment of the Future – Preparing for an Open Data Manager Contract
- **MOBILITY – DMA-**Prototype, Field Test and Analyze Mobility Applications
  - 6 concept of operations and data requirements recently awarded
- **AERIS -** Define 7 Transformative Applications

Vehicle to Infrastructure
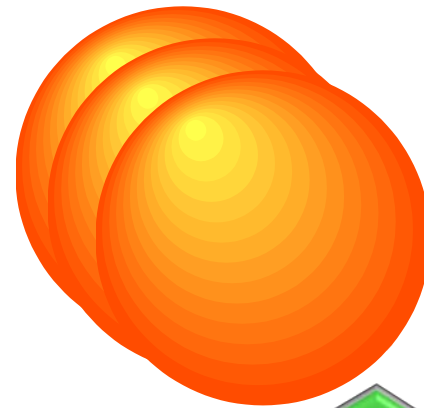
MOBILITY BUNDLES
- Signal Systems
- Transit Management
- Freight
- R.E.S.C.U.M.E.
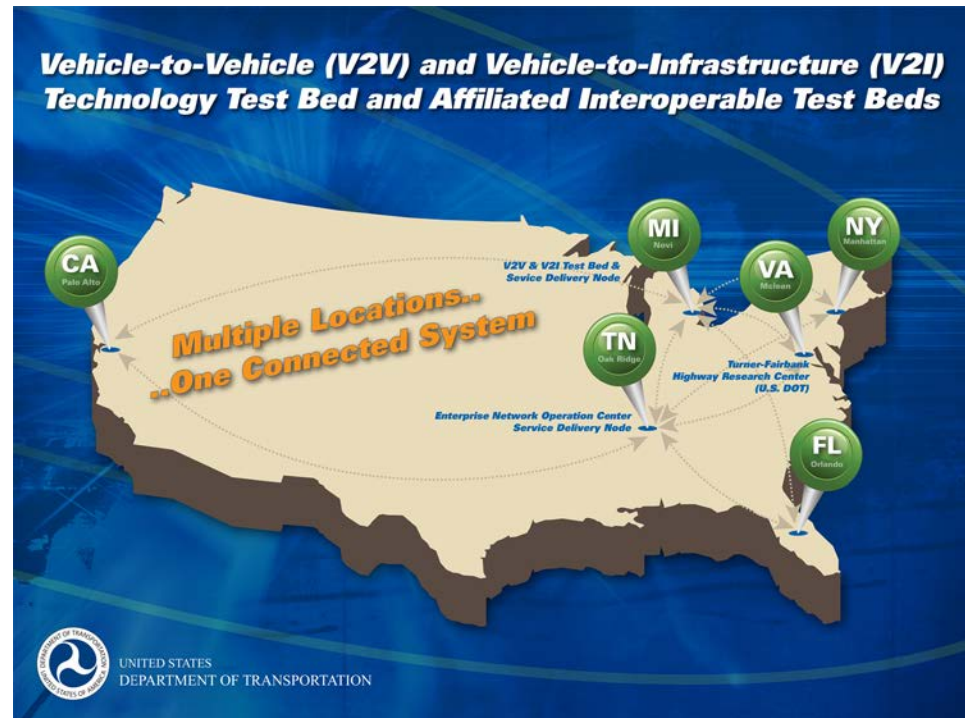- AnableATIS
- Speed Harmonization

AERIS

Progress Step Five – Build a Reference Implementation

2011

- Testbed is Up and Running. Interoperable equipment in California, Florida, New York, Michigan, Virginia, and Network Operations in Tennessee

2012 to 2013

- Reflect the System Architecture
- Utilize Harmonized International Standards
- Implement a Certification Process
- Implement a Governance Process
- Implement a Security Process

Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) Technology Test Bed and Affiliated Interoperable Test Beds

Multiple Locations.. ..One Connected System

CA Palo Alto
MI Novi
NY Manhattan
VA McLean
TN Oak Ridge
FL Orlando

V2V & V2I Test Bed & Service Delivery Node
Turner-Fairbank Highway Research Center (U.S. DOT)
Enterprise Network Operation Center Service Delivery Node

UNITED STATES DEPARTMENT OF TRANSPORTATION

Progress Step Six - Conduct Regional Pilots

Begun Discussing the Theme with Stakeholders

- Multiple Implementation Areas

- Opportunity to Pilot a variety of applications per area's need (Sites choose from a suite of field tested applications)

- Seeds Implementation

- Uses Lessons Learned from Safety Pilot

- Builds on a Stakeholder Defined Architecture

- Accelerates DSRC for Safety

- Leverages Available Wireless Communications for Mobility and Environment Applications

- Leverages Private Sector Investments Occurring Now

Major Milestones

PROGRAM AREA	FOUNDATIONAL ANALYSIS	RESEARCH, DEVELOPMENT & TESTING	PILOT IMPLEMENTATIONS

Timeline markers: 7/09 — 1/11 — 7/11 — 7/13 — 7/15

SAFETY

Safety V2V — Safety Workshop — V to V Apps — NHTSA Agency Decisions — LV — HT

Safety Pilot — Qualified Product Lists (QPLs) — Safety Pilot — B Safety Benefits Assessment Completed

Safety V2I — Initial Aftermarket V to I Apps — V2I Apps Defined — Regional Pilots

MOBILITY

Data Capture — Mobility and Environment Workshop — Data Environments

Dynamic Mobility Apps. — High-Priority Mobility Apps Announced — Apps Develop — Mobility Benefits — B

TECH

Testbed Sys. Eng. Security Standards — Testbed Launch — Revised Architecture Released — Upgraded Testbed Launch — Prototype Security Process

ENV.

AERIS — High-Priority AERIS Applications Selected — B AERIS Benefit

Policy

Certification — Prototype Certification Process

Governance — Prototype Governance Structure

U.S. Department of Transportation

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USDOT Commercial Vehicle (CV) ITS Research Plan for Wireless Connectivity – Final 7-27-11

	CY 2010	CY 2011				CY 2012				CY 2013				CY 2014			
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

Track 1 — Smart Roadside

- ◆ SRI Contract Award - 11/02/2010
- SRI Apps Assessment
- ◆ SRI ConOps - 9/20/2011
- SRI ConOps
- SRI Reqs Analysis
- ◆ SRI Requirements & Architecture - 1/19/2012
- SRI Arch & Design
- Develop & Test Prototype
- CV FOT Planning | Buildup | CV FOT
- Smart Roadside Deployment Guidelines and Specifications
- **SRI Deployment Recommendations and Guidelines** ◆

Track 2 — Related Research

- Wireless Roadside Inspection
- Electronic Screening at International Borders Model Deployment Initiative
- Universal Truck Identification
- Bridge Hit SBIR

Track 3 — Vehicle to Vehicle Safety

- DVI Needs Specification
- ◆ **Safety Pilot DVI Criteria**
- ◆ **CV DVI Guidelines**
- ◆ **CV V2V Safety Workshop**
- Develop Performance Requirements
- Integrated CV Builds
- CV Driver Clinics
- Final Performance Specifications & Test Procedures
- CV Interoperability Issues
- CV Retrofit Safety Device
- Performance Testing
- **NHTSA Agency Decision (CV)**
- Objective Test Procedures
- Interoperability Testing
- Estimate CV Safety Benefits ◆

Track 4 — Safety Pilot

- BSM Transmission Device
- ◆ 2011 World Congress
- Pre-Model Deployment
- Model Deployment
- Post-Model Deployment
- Independent Evaluation of Testing Activities
- ◇ V2V Benefits Assessment
- ◆ **NHTSA Agency Decision (LV)**

Track 5 — Mobility

- FRATIS (Freight Advanced Traveler Information System) ConOps Development
- FRATIS Applications Development and Readiness Testing
- FRATIS Operational Testing

Track 6 — Plcy-Stds

- CV Standards Message Definition & Participation
- CV Policy

Regional Pilots

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ITS Connected Vehicle - Truck Focus

Connected Commercial Safety Applications Development Project

- Awarded to Battelle, project team comprised of
  - Mercedes Benz Research and Development North America (MBRDNA)
  - Daimler Trucks North America (DTNA) Advanced Research NAFTA
  - University of Michigan Transportation Research Institute (UMTRI)
  - DENSO INTERNATIONAL North America Research Laboratory (NARL)
  - Meritor WABCO

- Period of Performance – May 2011 through June 2014

- Integrate and test truck safety applications, participate in Safety Pilot, and hold truck driver clinics

ITS Connected Vehicle - Truck Focus

- Smart Roadside Initiative
- Awarded to SAIC, project team comprised of:
    - North Dakota State's Upper Great Plains Transportation Institute (UGPTI)
    - American Transportation Research Institute (ATRI)
    - Delcan Corporation
    - Commercial Vehicle Safety Alliance (CVSA)

- Period of Performance November 2010 – December 2013

- Project is identifying and integrating successful deployments of truck-specific roadside technology, developing a Concept of Operations , and testing prototype(s) of Smart Roadside Applications.

ITS Connected Vehicle - Truck Focus

- Commercial Vehicle Retrofit Safety Device (RSD) – OPEN PROCURMENT
  - Will create RSDs for testing and participation in Safety Pilot

- Dynamic Mobility – Freight Advanced Traveler Information (FRATIS) OPEN PROCURMENT
  - Part of Connected Vehicle Mobility Program
  - Con Ops development
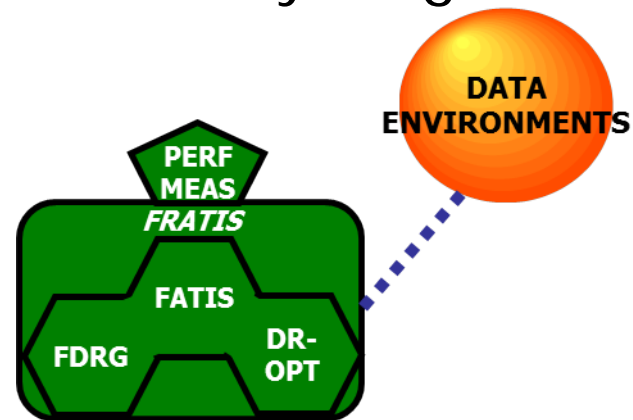
ITS Connected Vehicle - Truck Focus

- Trucking Industry Mobility and Technology Coalition **(TIMTC)**

  - Partnership between US DOT (all modes) and Truck Stakeholders led by ATRI in partnership with CVSA and AASHTO

  - Annual business meeting at ATA's Management Conference and Expo – Oct 17-18 – Grapevine, TX

  - For more information:
    www.freightmobility.org

For More Information

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