

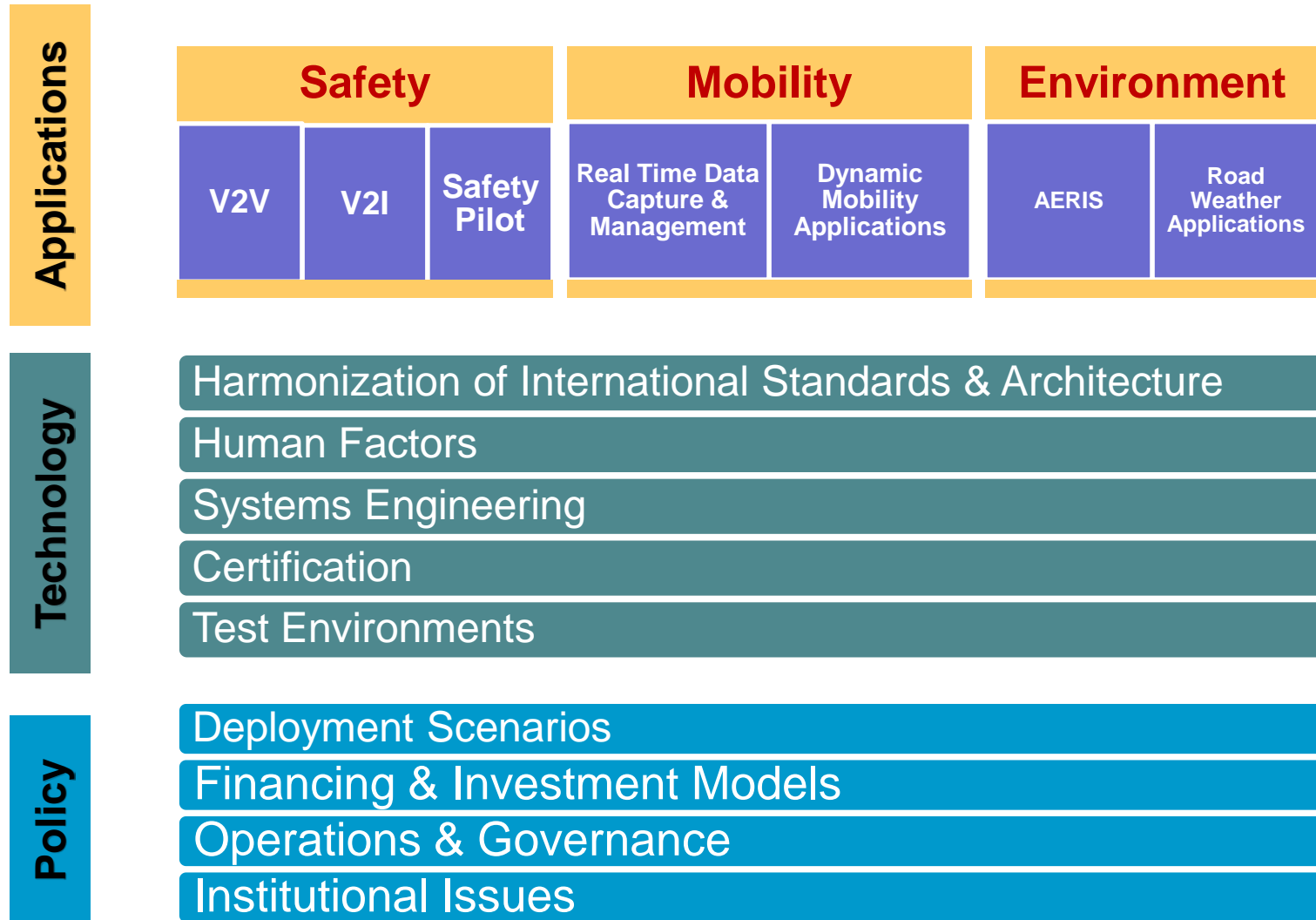
Connected Vehicle Update

ITS Committee Meeting

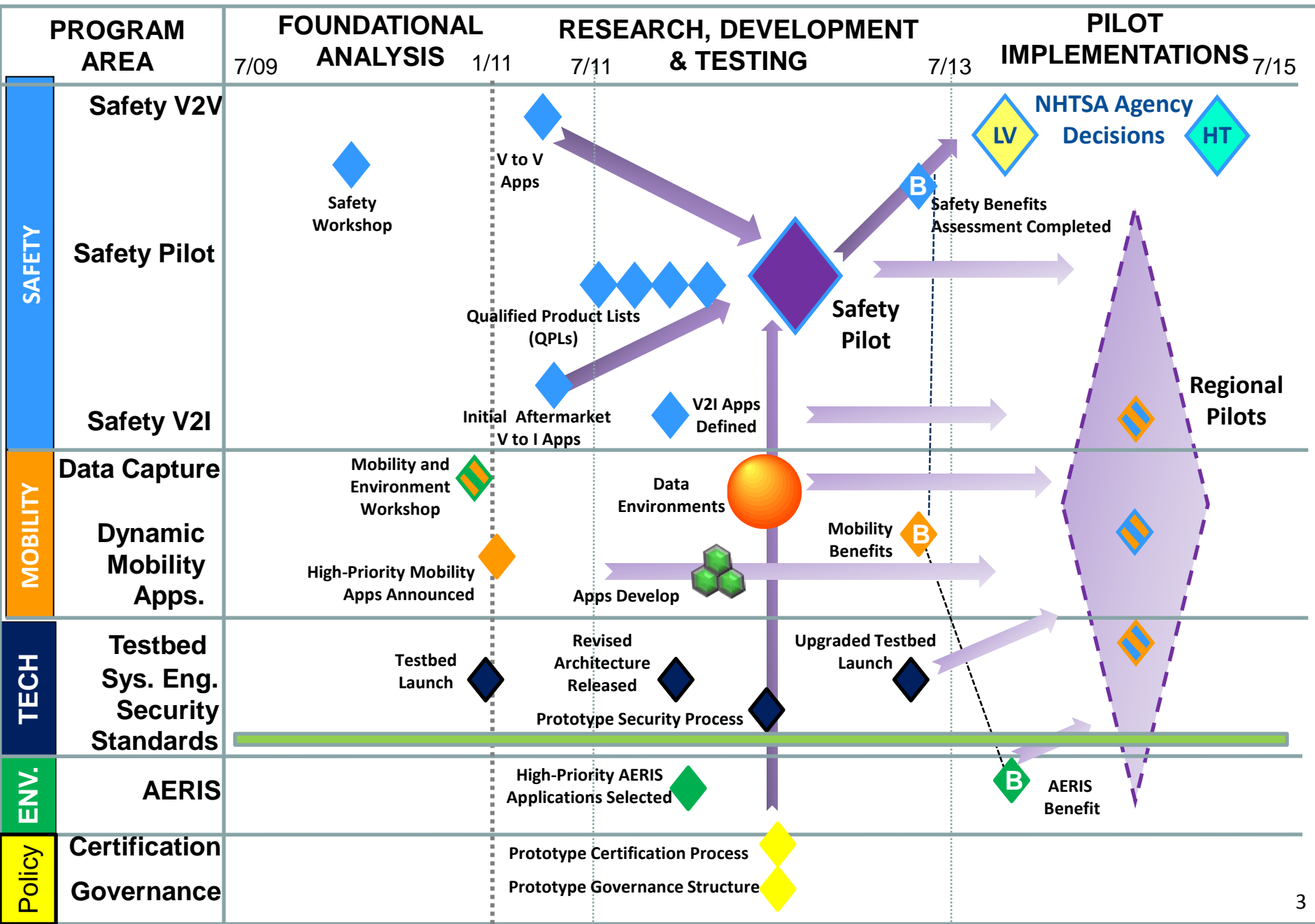
January 25, 2012

Brian Cronin, Intelligent Transportation Systems
Joint Program Office, RITA, U.S. DOT

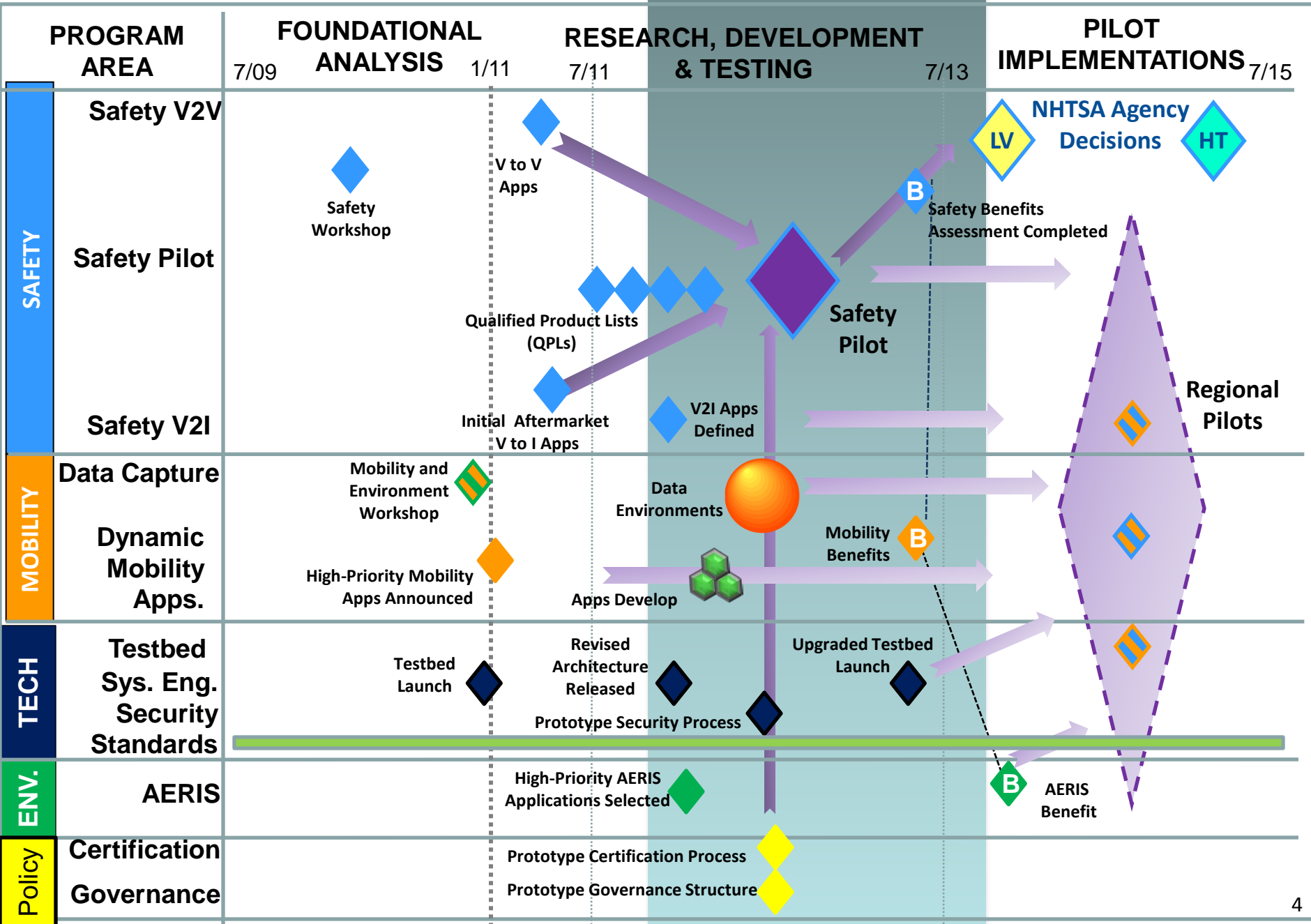
ITS Research Program Components



Major Milestones



Major Milestones



Overview

- Safety Pilot
- Policy
- V2I Safety
- Data Capture and Management
- Dynamic Mobility Applications
- AERIS

Safety Pilot Objectives

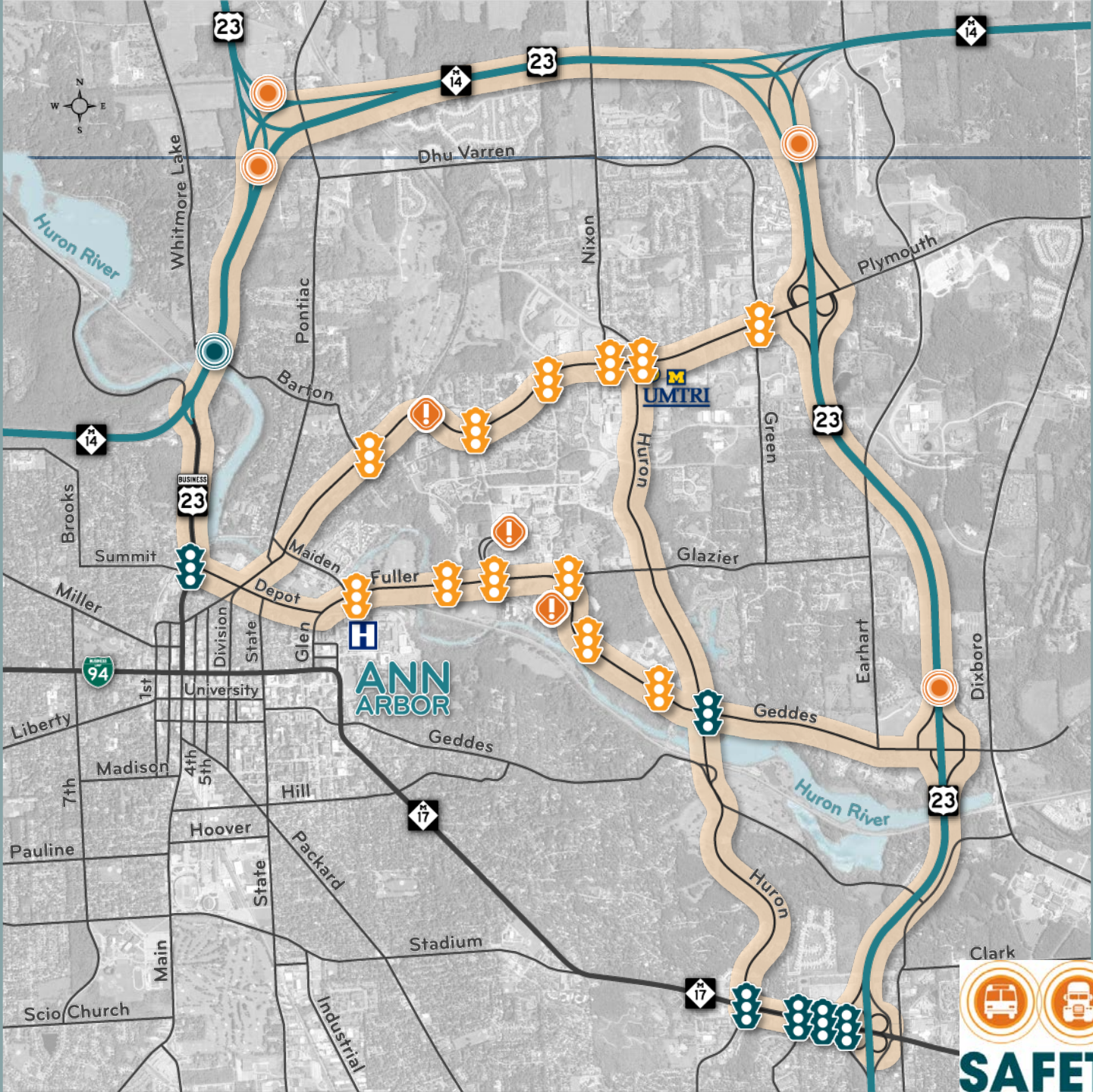
- Generate empirical data for supporting 2013 and 2014 decisions
- Show capability of V2V and V2I applications in a real-world operating environment using multiple vehicle types
- Determine driver acceptance of vehicle-based safety warning systems



Safety Pilot Objectives (cont)

- Assess options for accelerating the safety benefits through aftermarket and retrofit safety devices
- Extend the performance testing of the DSRC technology
- Collect lots of data and make it available for industry-wide use
- Let others leverage the live operating environment



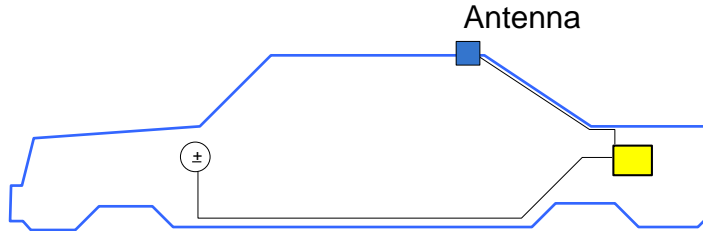


SAFETYPILOT

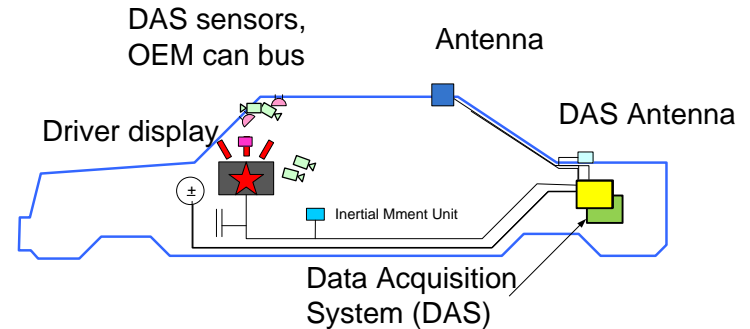
Device Installation Examples

(Passenger vehicles - Drivers' own vehicles)

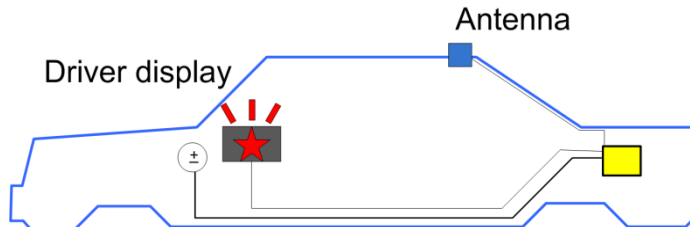
Vehicle Awareness Device



Aftermarket Safety Device with Data Acquisition System (DAS)



Aftermarket Safety Device



Data Acquisition from:

- Aftermarket device
- Radar or ranging device(s)
- 4 cameras, microphone
- OEM CAN bus data
- Vehicle motion
- Cell & GPS antennas



Commercial Vehicle Fleets

(3 Integrated Trucks, 16 Retrofits, ~50 VADs)

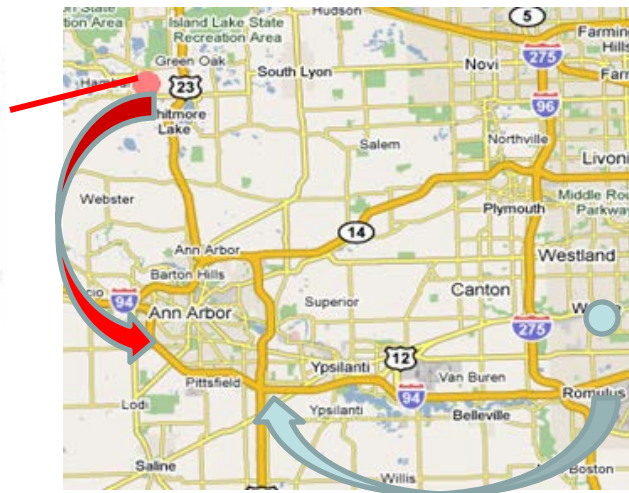
Con-way Freight

- Less-than-truckload carrier (daytime pickup/delivery, nighttime line-haul)
- UMTRI/DOT partner in past projects



Sysco Detroit LLC

- Food-service products for restaurants, schools, etc.
- Mix of tractors, trailers



MODEL DEPLOYMENT

Transit Vehicle Fleets

(3 Integrated Buses, ~100 Vehicle Awareness Devices)

Ann Arbor Transit Authority

- Operates 67 buses
- Active in national programs



University of Michigan

- Operates 61 buses
- Model deployment area spans two separate campuses with high bus traffic between and within.

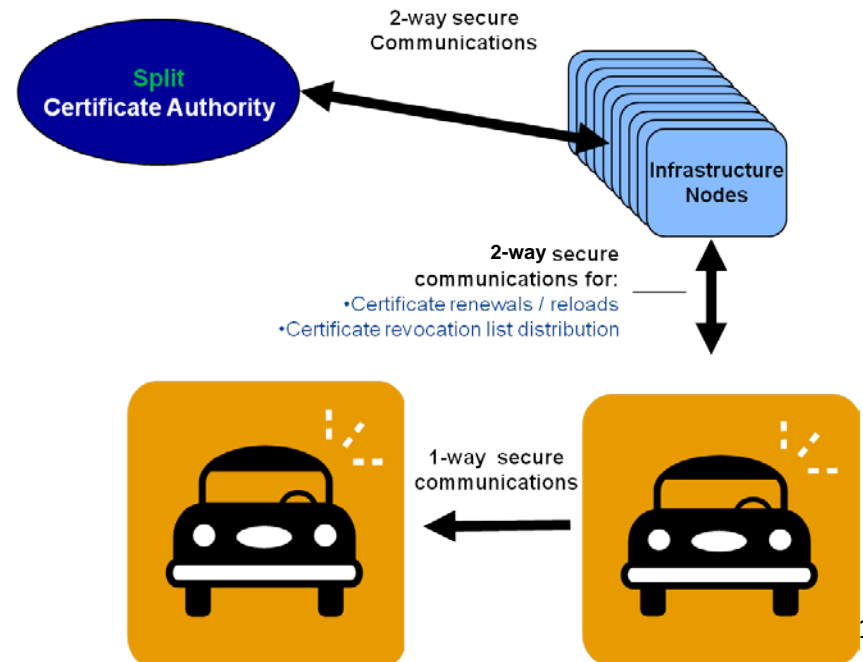
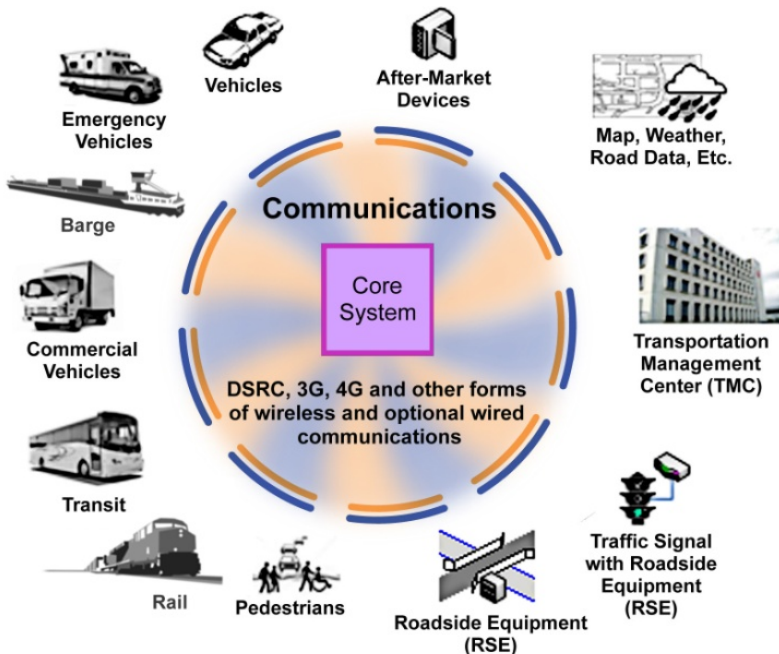


Policy Research Focus

- **Determine if V2V is feasible to implement**
 - **Security Needs**
 - Functional Requirements
 - Physical/Technical Requirements
 - Operational & Organizational Requirements
 - Financial Sustainability and Responsibility

Policy - Security Network

- The V2V/V2I system requires communications media for two critical purposes:
 - Secure communications for distribution of certificates and revocation lists to make sure that entities on the system are legitimate users
 - Trusted communications for delivering safety application data and messages (and, potentially, other applications and services)



Critical Questions

- **Which communications media can support the needs for distributing security certificates? Choices include:**
 - Existing Cellular Networks
 - Dedicated Short Range Communications (DSRC)
 - WiFi
 - Vehicle-Based Security Option
- **What are advantages and limitations of each?**
- **How should the organizational functions of security certificate distribution and management be structured?**
 - Who should be responsible for them and how should they be funded initially and over time?

Communications Network Options and Analysis to Date

Analyze Data Delivery (Network) Options:

Requirements Definition: Fall 2011

Communications Options Analysis: Winter 2011/12

Business Models Analysis: Spring/Summer 2012

Supportable Operationally – Certificate Management

- **Develop Certificate Management Organizational/Operational Models:**
 - Roles and responsibilities
 - Organizational models
- **Project Schedule:**
 - Options due in winter 2011
 - Public meeting in April 2011 (for organizational analysis and network options – interim analysis for both projects)
 - Prototype testing: June 2012
 - Test Results and Evaluation of Approach: Jan 2013
 - Final Report: July 2013

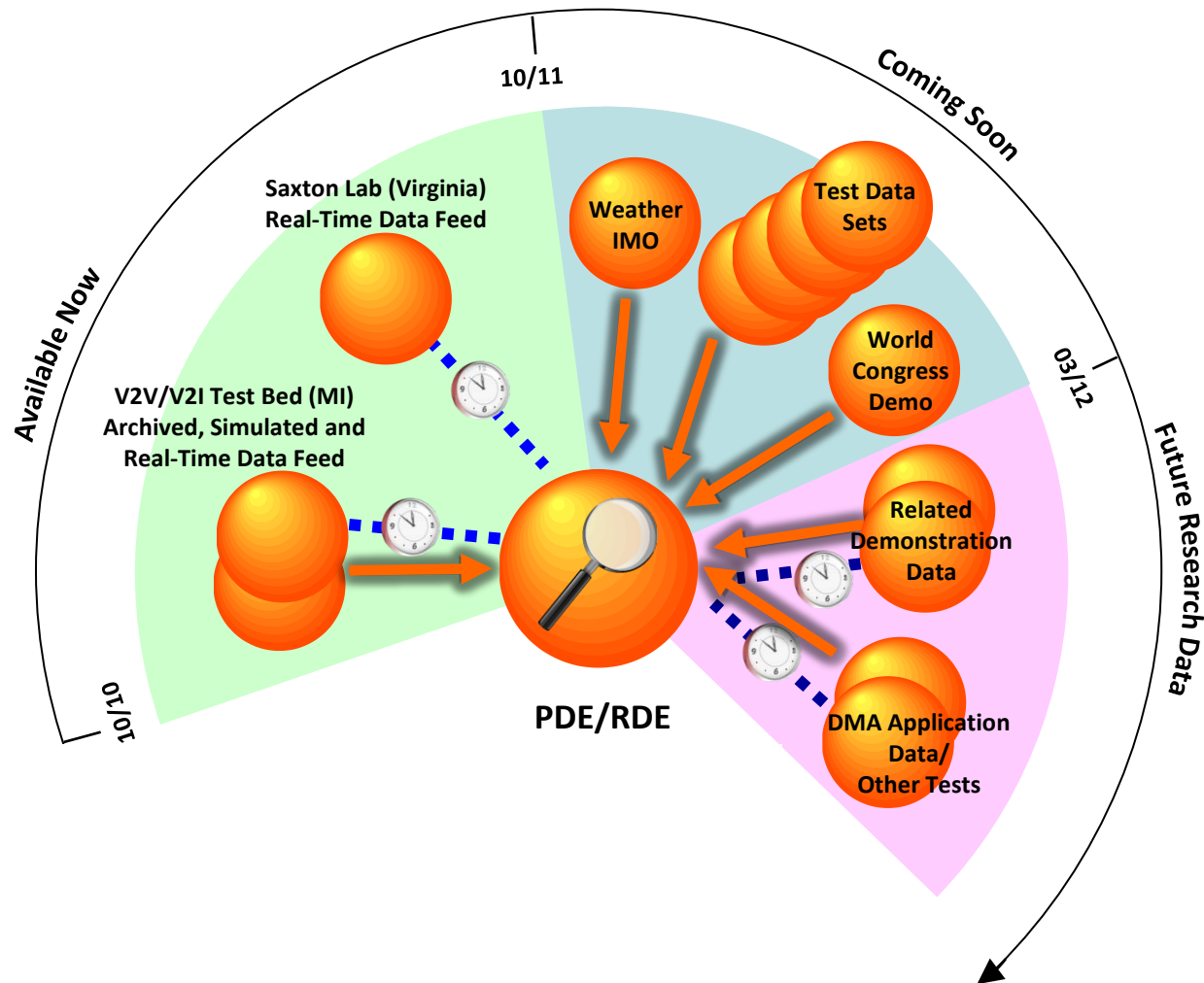
Supportable Operationally – Financial Models

- **All security network options require financing for operational support**
 - **All public** – politically feasible?
 - **Public/private partnership** – what type of framework?
 - **All private** – where's the value?
 - Data
 - Transactions
 - Spectrum
 - Other

V2I Safety

- Enabling Technologies – Working Towards an Integrated V2I Prototype
 - Signal Phase and Timing
 - Positioning
 - Communications
 - Mapping
 - End of 2012
- Applications
 - Broad Concept of Operations
 - Transit Applications
 - Smart Roadside
 - Working towards launching application development in 2012

Data Capture and Management: Near-term Data Products



Data Capture and Management – Key Issue

- Assessment of Data Elements in the SAE J2735 - Basic Safety Message
 - What can we do with the Data if delivered only via DSRC (Density of roadside locations to be effective)?
 - What can we do if the data is delivered via other communication media?
 - Are there other critical data elements?
- Do we need to modify the SAE J2735 Probe Data Message Process and do we need to develop a performance criteria standard?

Dynamic Mobility Applications

- 6 Mobility Bundles Selected
- Contracts awarded to develop Concepts of Operations
- Stakeholder Workshops to Gather User Needs in progress
 - EnableATIS – held Dec 8, 2011
 - FRATIS – held Nov 3, 17, 29 and Dec 3, 2011
 - INFLO – to be held February 8, 2012, in Washington DC
 - IDTO – to be held January 26-27, 2012, in Washington DC
 - R.E.S.C.U.M.E. – TBD
 - M-ISIG – TBD
- Mobility Stakeholder Workshop being planned for ITSA Annual Meeting May 2012 in Washington DC

AERIS

- Identified Transformative Apps - Eco-Signals, Eco-Lanes, Low Emissions Zones, Support for Alternative Fuel Vehicle operations, Eco-Traveler Information, and Eco-ICM
- Coordinated Nationally and Internationally - Held six webinars (Intro to AERIS, two on State of the Practice Reports, and three on the BAA research results), US/EU Sustainability Working Group (Vienna, Orlando), Japan METI and MLIT
- Developed detailed outlines for each of the transformative Concepts in preparation for development of ConOps for each
- Planning a public workshop March 14-15 in Washington, DC to further discuss data and other requirements for the TCs
 - Registration information and draft agenda to be developed and circulated soon.

Coming Soon / What Should I Do

- Review the Recently Released Connected Vehicle System Architecture
- Qualified Products Lists for
 - Vehicle Awareness Devices
 - Aftermarket Safety Devices
 - Roadside Equipment
 - Consider Buying Some, Get Engaged, Do Some Research
 - USDOT to post Mobility Research Questions soon
 - Considering additional Challenges using equipment and data
- Stakeholder Input Sessions
 - Safety - August
 - Dynamic Mobility Applications - May
 - AERIS - March
 - Policy - April
 - Attend, Contribute, Lead
- Updated Connected Vehicle Testbed coming soon

For More Information

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

Intelligent Transportation Systems
Joint Program Office

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Updated September 28, 2011 3:37 PM

Imagine that . . .
... transit and truck drivers receive regular updates, allowing them to stay on schedule -- and stay in business.

Real-Time Transit Data Demonstration Projects Awarded to Integrated Corridor Management Demonstration Sites
ICM is the management of the corridor as a system, rather than the traditional approach. [Read more...](#)

- U.S. DOT Announces Free Public Meeting and Webinar to Discuss the EnableATIS Dynamic Mobility Application 9/28/11
- Statement of Shelley Row, Director of the ITS JPO, on the Departure of RITA Administrator Peter Appel 9/27/11
- U.S. Department of Transportation Announces Winner of the ITS Video Challenge 9/13/11

[More News>>](#)

Our Current Research

Applications | Mode-Specific | Cross-Cutting

- Vehicle-to-Vehicle Safety
- Vehicle-to-Infrastructure Safety
- Real-Time Data Capture
- Dynamic Mobility Applications
- Environment
- Road Weather

[More >>](#)

SAFETYPILOT

Public Meetings [View >>](#)

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