

Research for V2I Communication and Safety Applications

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U.S. Department
of Transportation

**Federal Highway
Administration**

2011 ITE Technical Conference
Orlando, FL

V2I for Safety Program Concept

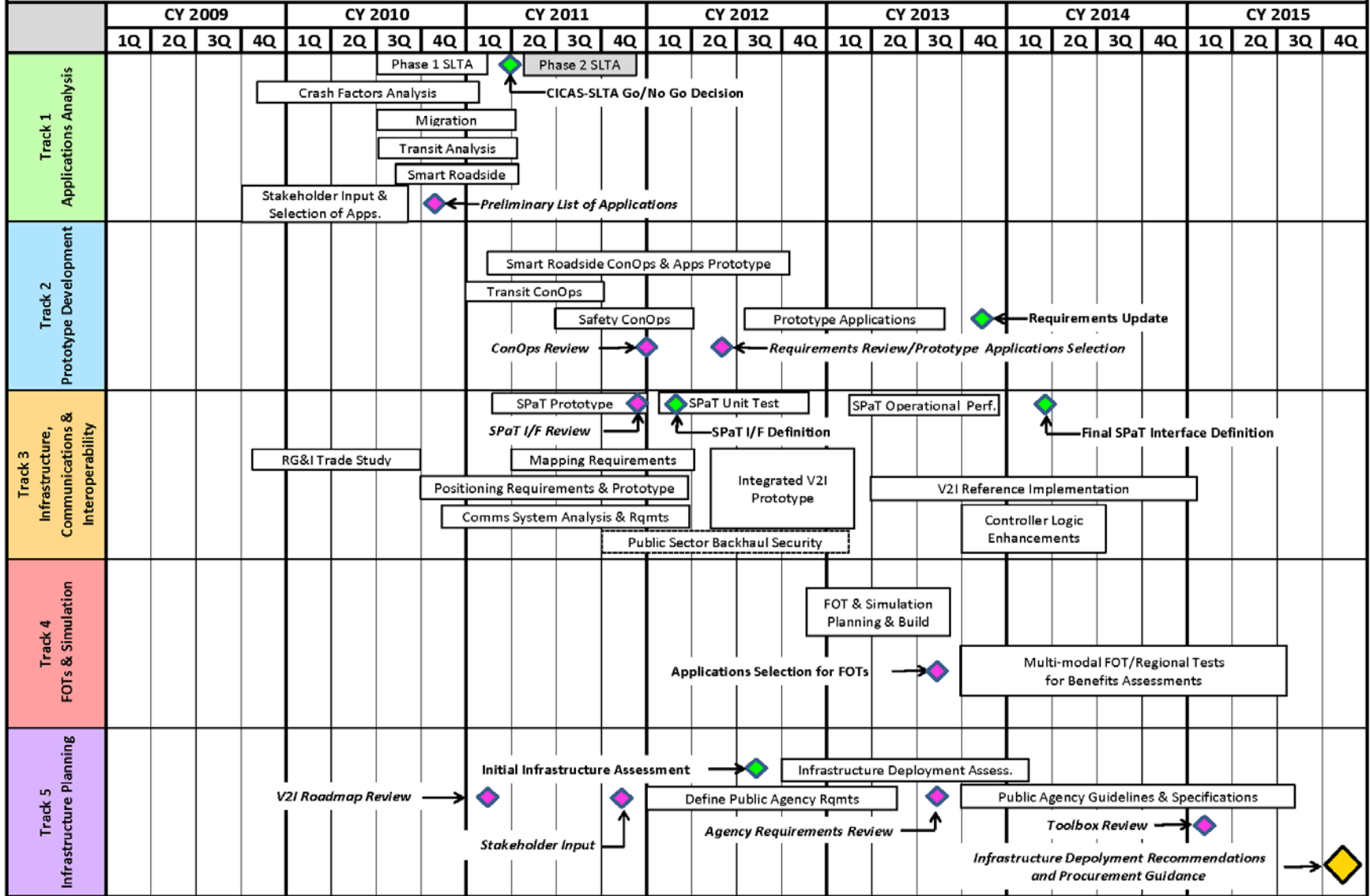
- Vehicle to Infrastructure (V2I) communications for Safety is the wireless exchange of critical safety and operational data between vehicles and highway infrastructure
- The purpose of this data exchange is to not only mitigate motor vehicle crashes by using wireless safety applications, but also enable a wide range of other applications that also enhance mobility and provide benefits to the environment
- V2I applies to all vehicle types and roadway facilities



V2I Roadmap Tracks

- Track 1 – Applications Analysis
- Track 2 – Prototype Development
- Track 3 – Enabling Technologies
- Track 4 – FOTs & Simulation
- Track 5 – Infrastructure Planning

V2I Safety Applications Roadmap - 6 April 2011



Stakeholder Input Opportunities

Major Milestones

Track 1 – Applications Analysis

- Selection of Applications
 - Stakeholder Input meeting held with AASHTO in Irvine CA – Fall 2010
- Crash Factors Analysis
 - Draft final report has been received and is being evaluated
- Infrastructure Migration Study
 - Final report anticipated this spring

Safety Applications

- Running red light
- Running stop sign
- Gap assist at signals
- Gap assist at stop control
- Speed warnings
 - Curves
 - School Zones and Work Zones
 - Poor weather conditions
 - Variable speed limit locations

Safety Applications (2)

- Work zone alerts
- Pedestrian Detection by Infrastructure
- Priority Assignment for EV Preemption
- At-grade rail crossing (light & heavy)
- Bridge clearance warning
- Secondary accident warning
- Lane departure warning

Track 2 – Prototype Development

- Development of Safety Applications Concept of Operations (Con Ops)
 - Work will be ongoing through 2011
 - Stakeholder input workshop anticipated for winter 2011
 - Select list of Safety Applications for full development of Con Ops
- Completion of Con Ops will provide required information needed to make a selection of safety applications for further R&D testing/prototyping (2013)
- Stakeholder input for prototyped applications (summer 2012)

Track 3 – Infrastructure Enabling Technologies (1)

- Signal Phase and Timing (SPaT) interface definition
 - Contract awarded to Battelle - January 2011
 - SME workshop - Spring 2011
 - Con Ops completed - Summer 2011
 - Opportunity for broader industry input at this time
 - First prototypes ready for unit testing in Jan 2012 (to be tested with 2 controllers and up to 4 different RSE)
 - Initial SPaT Interface Definition available for use in Safety Pilot - 1Q 2012

Track 3 – Infrastructure Enabling Technologies (2)

- Communications and Positioning
 - Trade studies are underway; stakeholder input has been and will continue to be solicited.
 - Requirements defined for select applications in Fall 2011
 - Unit Testing at TFHRC planned for Fall 2011
- Mapping
 - Trade study completed November 2010
 - Mapping requirements and prototype work currently underway
 - Mapping of TFHRC planned for Fall 2011

Track 3 – Infrastructure Enabling Technologies (3)

- Integrated Prototype – Spring 2012
 - Linking the communications, positioning and mapping technologies and assessing interactions
 - Installed at TFHRC
- Reference V2I Implementation – 2013
 - SPaT interface definition and integrated prototype work together to support safety and mobility applications
 - Installed at TFHRC, expanded to MI and other testbeds
- Backhaul Security
 - being addressed under SE contract
 - FHWA considers network security a high priority and will work with practitioners to ensure that all concerns are addressed

Track 4 – FOTs & Simulation

- Providing input to Safety Pilot-Obtain lessons learned
- Analyze applications for Field Operational Tests (FOT) selection – 2013
 - Planning for FOTs will occur in late 2012 with stakeholder input for selection in 2013
- FOTs will be used to gather valuable safety data and assess the benefits for deployment
 - FOTs may be integrated into regional demonstration projects including multi-modal safety applications and dynamic mobility applications

Track 5 – Infrastructure Planning

- Define public agency requirements 2012 thru 2015
 - Stakeholder requirements review – Summer 2013
- Development of Practitioner Toolbox for Deployment (2013 – 2015)
 - Opportunity for stakeholder input on toolbox during development – early 2015
 - Toolbox will serve as guidelines and recommendations for equipment procurement, system installation specs, and summary of benefits

For More Information

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