IntelliDrive^{SM}

Vehicle - Infrastructure Safety Applications Selection Process

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Applications for the Public Sector
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U. S. Department of Transportation
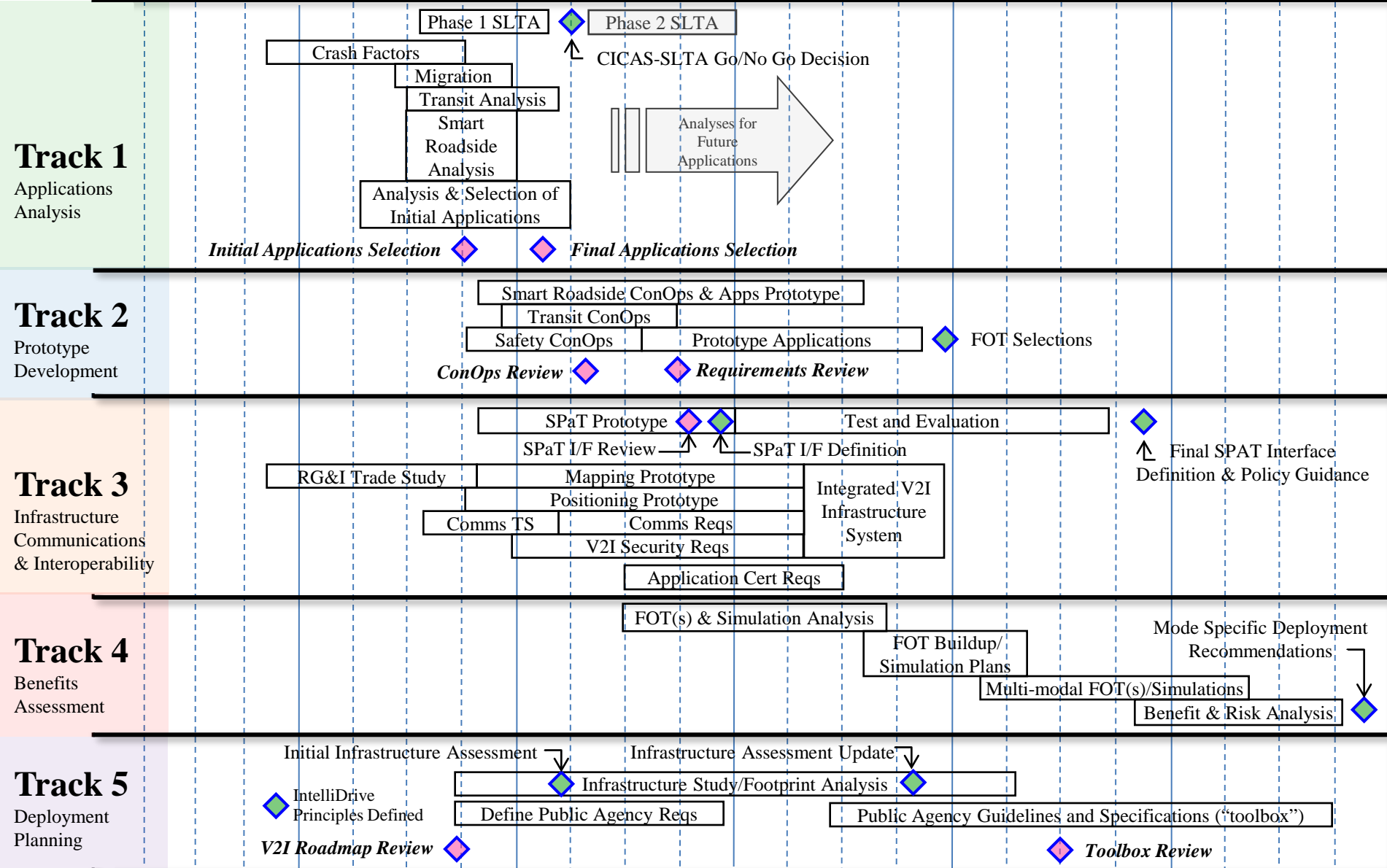Research and Innovative Technology Administration

Presentation Overview

- V2I Roadmap

- Selection Process Overview
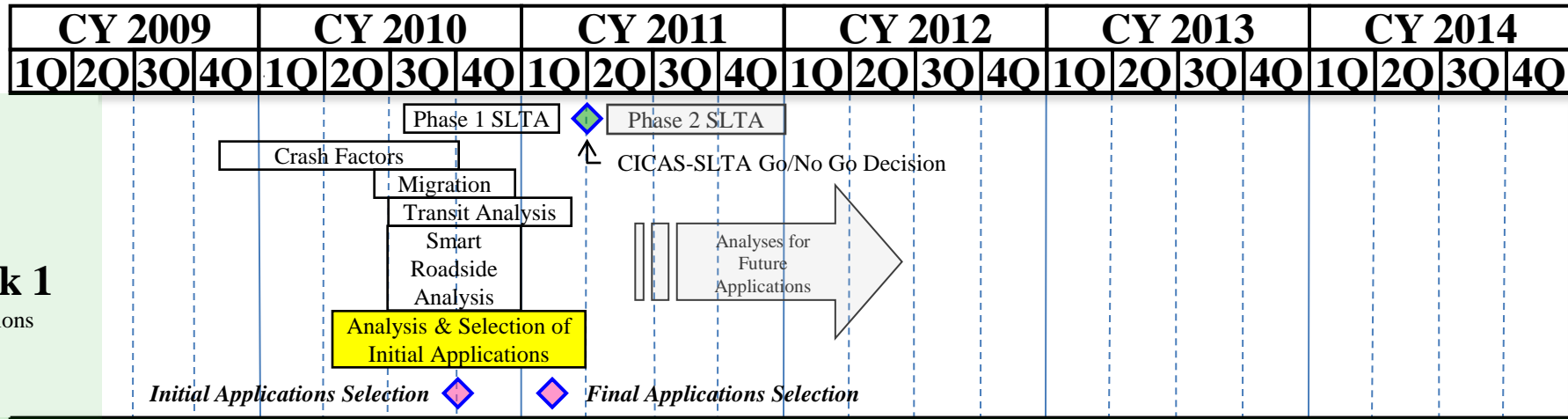
- Selection Criteria

- Applications

V2I Safety Applications Roadmap – Draft July 12, 2010

	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	CY 2014
	1Q 2Q 3Q 4Q	1Q 2Q 3Q 4Q	1Q 2Q 3Q 4Q	1Q 2Q 3Q 4Q	1Q 2Q 3Q 4Q	1Q 2Q 3Q 4Q

Track 1
Applications Analysis

- Phase 1 SLTA
- Phase 2 SLTA
- CICAS-SLTA Go/No Go Decision
- Crash Factors
- Migration
- Transit Analysis
- Smart Roadside Analysis
- Analyses for Future Applications
- Analysis & Selection of Initial Applications
- *Initial Applications Selection*
- *Final Applications Selection*

Track 2
Prototype Development

- Smart Roadside ConOps & Apps Prototype
- Transit ConOps
- Safety ConOps
- Prototype Applications
- FOT Selections
- *ConOps Review*
- *Requirements Review*

Track 3
Infrastructure Communications & Interoperability

- SPaT Prototype
- Test and Evaluation
- SPaT I/F Review
- SPaT I/F Definition
- Final SPAT Interface Definition & Policy Guidance
- RG&I Trade Study
- Mapping Prototype
- Positioning Prototype
- Integrated V2I Infrastructure System
- Comms TS
- Comms Reqs
- V2I Security Reqs
- Application Cert Reqs

Track 4
Benefits Assessment

- FOT(s) & Simulation Analysis
- FOT Buildup/ Simulation Plans
- Mode Specific Deployment Recommendations
- Multi-modal FOT(s)/Simulations
- Benefit & Risk Analysis

Track 5
Deployment Planning

- Initial Infrastructure Assessment
- Infrastructure Assessment Update
- Infrastructure Study/Footprint Analysis
- IntelliDrive Principles Defined
- Define Public Agency Reqs
- Public Agency Guidelines and Specifications ("toolbox")
- *V2I Roadmap Review*
- *Toolbox Review*

◇ *Stakeholder Engagement Opportunities*   ◆ Major Milestones

V2I Safety Applications Roadmap – Draft July 12, 2010

	CY 2009				CY 2010				CY 2011				CY 2012				CY 2013				CY 2014			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

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Initial Applications Selection

• NHTSA's Pre-Crash Scenario analysis

  http://www-nrd.nhtsa.dot.gov/pdf/esv/esv20/07-0412-O.pdf
  http://www.nhtsa.gov.edgesuite-staging.net/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2007/Pre-Crash_Scenario_Typology-Final_PDF_Version_5-2-07.pdf

• Crash Factors Analysis

• Applications for all vehicle types that is not mode-specific

Final Applications Selection

Incorporates

- Infrastructure Migration Analysis
- Transit Analysis
- Smart Roadside (Commercial Vehicle) Analysis

Selection Process

NHTSA Crash Scenario Analysis → V2I Crash Factors Analysis

Preliminary Stakeholder Input

Establish Selection Criteria

Preliminary list

Stakeholder Review using criteria & list - opportunity for adding to the list

Initial List to develop the ConOps

Develop ConOps

ConOps Review & Apps Selection for prototypes

Develop Prototypes

Prototype review and apps selection for FOT

Smart Roadside Applications Selection

Transit Applications Selection

2007 · · · · · · · · **2QCY10**   **3QCY10**   **4QCY10** · · · · · · · **2QCY11** · · · · · · · · · · · · **4QCY12**

Target Crash Population [1]

The estimated average annual number of annual crashes that could be impacted by the V2I application

Technical Feasibility

The probability that an "effective" IntelliDrive V2I for Safety application can be developed

Infrastructure RSE Deployment

The probability that targeted locations will be equipped with RSEs for IntelliDrive Safety applications.

Estimated Safety Impacts

The probability that a technically feasible application will result in a reduction in targeted crashes

Vehicle OBE Deployment

The probability that equipped Vehicles will include the targeted application

Multi-Modal Priority

The priority that a targeted application has for multi-modal safety principles

Early Adoption

The probability that an application will be adopted and deployed by practitioners

[1]Source: Pre-Crash Scenario Typology for Crash Avoidance Research, April 2007 (NHTSA - DOT HS 810 767)

Safety Applications under Consideration

Crash Scenario Application Areas		Safety Application Criterion[1]						
		Target Crash Population[2]	Technical Feasibility	Infrastructure RSE Deployment	Estimated Safety Impacts	Vehicle OBE Deployment	Multi-Modal Priority	Early Adoption
Intersections	Red Light Running	🟩	🟩	🟨	🟩	🟩	🟩	🟩
Intersections	Running Stop Sign							
Intersections	Gap Assist-Signalized							
Intersections	Gap Assist- Stop Control							
Speed Application	Curve Overspeed Warning							
Speed Application	School Zone - Speed Warning							
Speed Application	Work Zone - Speed Warning							
Smart Roadside (Commercial Vehicles)	Wireless Roadside Inspection							
Smart Roadside (Commercial Vehicles)	Universal Truck Identification							
Smart Roadside (Commercial Vehicles)	Virtual Weigh Station/E-Screening							
Smart Roadside (Commercial Vehicles)	Truck Parking Information							
Pedestrian and other Road Users	Work Zone Alert							
Pedestrian and other Road Users	Transit Applications							
Pedestrian and other Road Users	Pedestrian Detection for Warnings & Alerts							
	Other Applications for Consideration							

[1]Ratings are High (H - 🟩), Medium (M- 🟨) and Low (L- 🟥) based upon estimates from stakeholders and partners with the exception of Target Crash Population
2 Ratings are High (>200,000), Medium (50,000-200,000), Low (<50,000)

Intersections

- **Red Light Running**
  - Warn a driver who is about to run a red light
- **Running Stop Sign**
  - Warn a driver who is about to run a stop sign
- **Gap Assist - Signalized**
  - Advise a driver when it is unsafe to turn on a permissive green light
- **Gap Assist - Stop Control**
 - Advise a driver when it is unsafe to enter the intersection

Speed Applications

- Curve speed Warning
  - Alerts drivers who may be driving too fast for the curve they are about to enter

- School Zone - Speed Warning
  - Alerts drivers who may be driving too fast in an active school zone

- Work Zone - Speed Warning
  - Alerts drivers who may be driving too fast into an active work zone

- **Work Zone Alert**
  - Alerting driver of changes in traffic patterns due to construction

- **Pedestrian Detection for Warnings & Alerts**
  - Enabling technology for pedestrian detection that will facilitate the development of applications to provide warnings and alerts
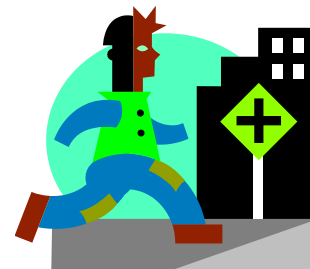
Questions?

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Roadmap
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