IntelliDrive
Vehicle-to-Vehicle
and
Safety Pilot

IntelliDrive Safety Workshop
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Ray Resendes
US Department of Transportation
National Highway Traffic Safety Administration

U.S. Department of Transportation

Who is NHTSA?

- ## DOT Mission Statement
  - Serve the United States by ensuring a safe transportation system that furthers our vital national interests and enhances the quality of life of the American people
    - Safety – Promote the public health and safety by working toward the elimination of transportation-related deaths and injuries

- ## NHTSA Mission Statement
  - To reduce deaths, injuries and economic losses resulting from motor vehicle crashes
  - Driver behavior
  - Vehicle Safety

NHTSA Congressional Authority

- ## NHTSA has congressional authority to establish Federal Motor Vehicle Safety Standards (FMVSS)
  - For motor vehicles and motor vehicle equipment
  - No person may manufacture or import a vehicle or item of equipment unless it complies with applicable FMVSS
  - Manufacturers must self-certify compliance
  - Authority to establish CAFE standards

- ## FMVSS have the force of law

Rulemaking Requirements

- Administrative Procedures Act
  - Transparency and openness
    - Notice and opportunity for comment
    - Public availability of information
    - Response to public comments
  - Reasoned and fair decision making

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Requirements for FMVSS

- Must meet a safety need
- Be practicable (technologically and economically)
- Objectively measurable compliance
- Performance-oriented (not design restrictive)
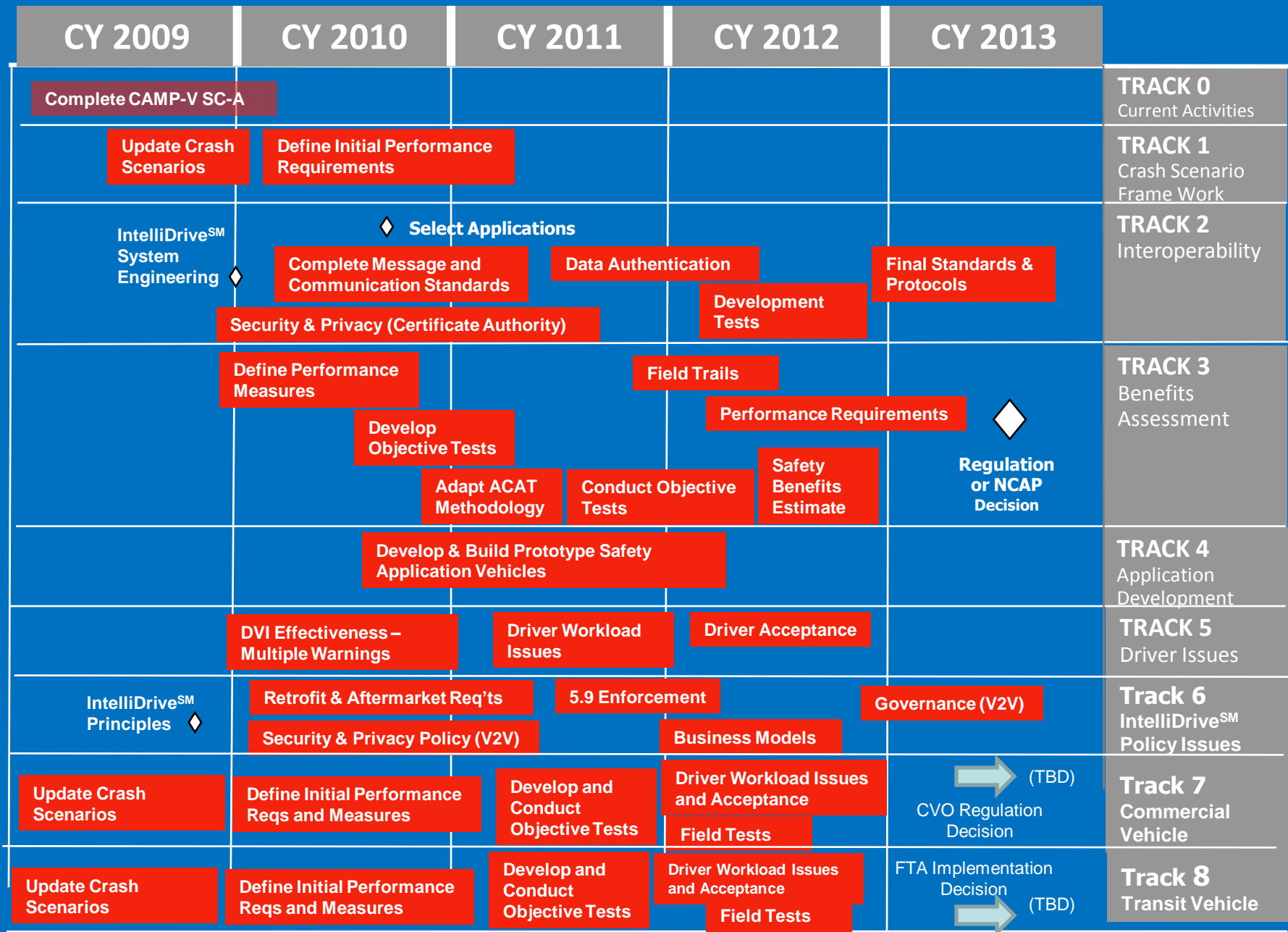- Appropriate for each vehicle type
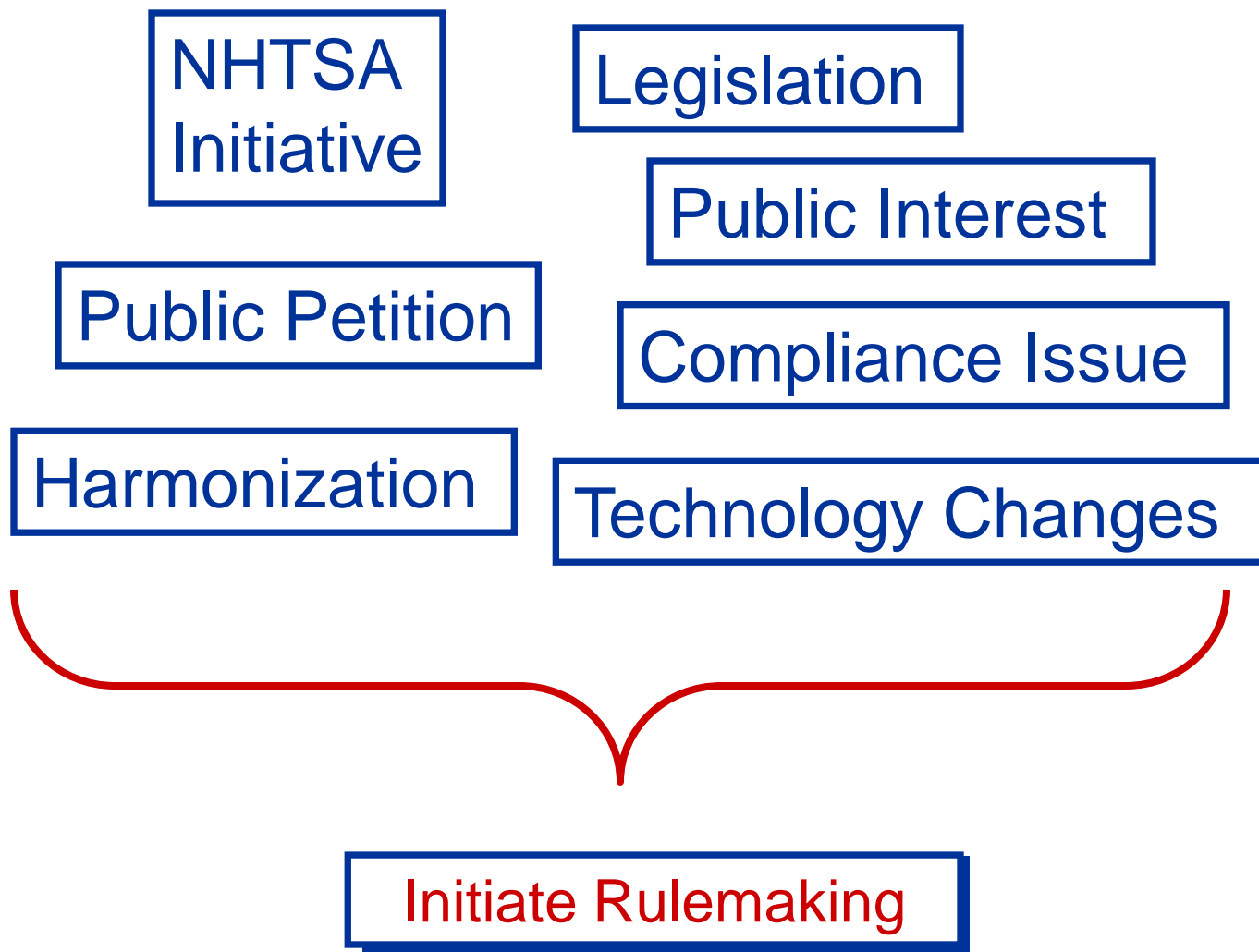
Vehicle Safety Communications

- Replace Onboard Sensors
- Dedicated Short Range Communications (DSRC)
  - 5.9 GHz
  - Low Latency
  - ~300m Range
- Positioning
  - GPS
  - Relative Positioning
  - High Accuracy DGPS not required
- No Digital Map Required

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Research Plan Assumptions

1. The primary application of V2V is to enable safety applications.

2. The deployment of V2V can not be dependent on public infrastructure.

3. The system architecture will be compatible with the evolution in infrastructure technology and deployment.

4. DSRC at 5.9 GHz is the only communication option, at this time

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Vehicle to Vehicle Safety Application Research Plan

CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	
Complete CAMP-V SC-A					**TRACK 0** Current Activities
	Update Crash Scenarios	Define Initial Performance Requirements			**TRACK 1** Crash Scenario Frame Work
IntelliDrive℠ System Engineering ◇	◇ Select Applications	Data Authentication	Development Tests	Final Standards & Protocols	**TRACK 2** Interoperability
	Complete Message and Communication Standards				
	Security & Privacy (Certificate Authority)				
	Define Performance Measures	Field Trails	Performance Requirements	◇ Regulation or NCAP Decision	**TRACK 3** Benefits Assessment
	Develop Objective Tests	Adapt ACAT Methodology	Conduct Objective Tests	Safety Benefits Estimate	
	Develop & Build Prototype Safety Application Vehicles				**TRACK 4** Application Development
	DVI Effectiveness – Multiple Warnings	Driver Workload Issues	Driver Acceptance		**TRACK 5** Driver Issues
IntelliDrive℠ Principles ◇	Retrofit & Aftermarket Req'ts	5.9 Enforcement	Governance (V2V)		**Track 6** IntelliDrive℠ Policy Issues
	Security & Privacy Policy (V2V)	Business Models			
Update Crash Scenarios	Define Initial Performance Reqs and Measures	Develop and Conduct Objective Tests	Driver Workload Issues and Acceptance	(TBD) CVO Regulation Decision	**Track 7** Commercial Vehicle
			Field Tests		
Update Crash Scenarios	Define Initial Performance Reqs and Measures	Develop and Conduct Objective Tests	Driver Workload Issues and Acceptance	FTA Implementation Decision (TBD)	**Track 8** Transit Vehicle
			Field Tests		

V2V Program

Track	Objectives
1 – Crash Scenario	Develop a comprehensive Pre-Crash Scenario Framework, and countermeasure concept profiles for both light vehicles and heavy trucks.
2 – Interoperability	Ensure that V2V safety systems can successfully function across equipped vehicles regardless of make/model.
3 – Benefits Assessment	Benefits assessments for V2V safety applications
4 – Application Development	Develop applications for benefits assessment
5 – Driver Issues	Develop a framework to assess the impact of driver issues on the effectiveness of DVI's used with V2V safety applications.
6 – Policy	Through coordination of the technical and policy aspects of V2V this track will result in a set of policy recommendation to support V2V deployment.
7 -Commercial Vehicles	Identify and coordinate the commercial vehicle component of V2V safety applications.
8 – Transit Vehicles	Identify and coordinate the transit vehicle component of V2V safety applications.

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Safety Pilot

Goals:
- Support the 2013 Regulatory V2V Decision with Field Data
*- Public Awareness & Acceptance*

Primary Objectives

- Demonstrate V2V real world implementation
  - Multiple vehicle types (cars, trucks, buses, rail, etc)
  - Obtain substantial empirical data
- Assess driver acceptance of vehicle based safety systems
- Explore opportunities for accelerating safety benefits through aftermarket devices and retrofit systems

Secondary Objectives

- Enable vehicle-infrastructure (V2I) safety applications
- Leverage data for non-safety applications such as mobility, environment, and weather

IntelliDrive Safety Pilot Roadmap (rev 16a)

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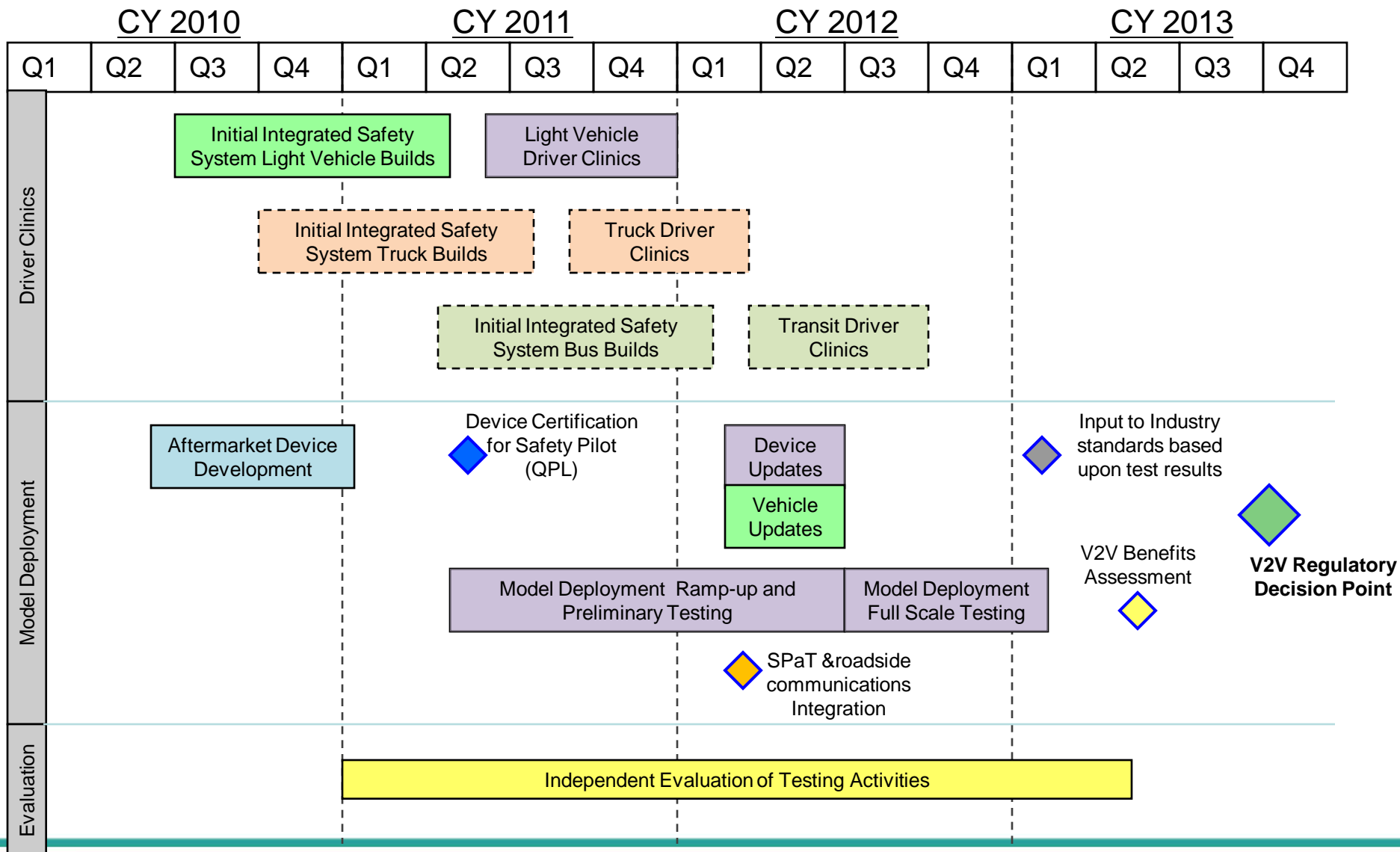
Track 1 – Light Vehicle Driver Clinics and Performance Tests
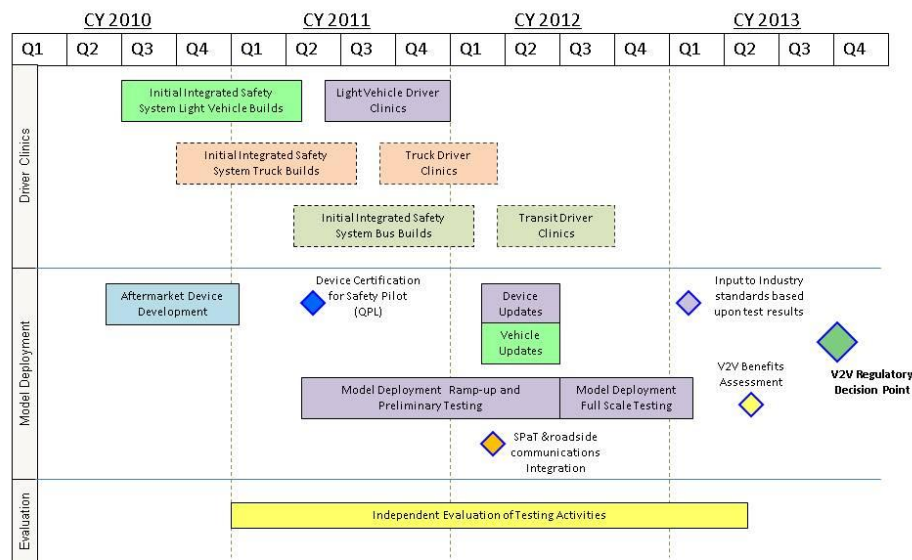
Objectives

- Driver acceptance data from light vehicle driver clinics at various locations
- Explore similar opportunities for other vehicle types
- Performance testing in multiple geographic environments using small numbers of light vehicles and nomadic devices at same locations

Key Tasks

- Site Selection
- Prepare Test Vehicles
- Recruit Test Subjects
- Conduct Driver Clinics
- Conduct Performance Tests
- World Congress Demonstration

IntelliDrive Safety Pilot Roadmap (rev 16a)

# Track 2 – Model Deployment

Objective

- Critical Mass/Exposure testing → large number of vehicles and devices creating a "highly saturated" operating environment
- Mixture of integrated safety systems with nomadic devices
- Light Vehicle focus with Transit and Heavy Vehicle Option
- Lots of vehicles, limited infrastructure

Key Tasks

- Prepare Integrated Vehicles
- Prepare Cooperative Vehicles
- Implement Interoperability Functions
- Conduct Verification Test
- Conduct Full Model Deployment
- Data Analysis and Dissemination

IntelliDrive Safety Pilot Roadmap (rev 16a)
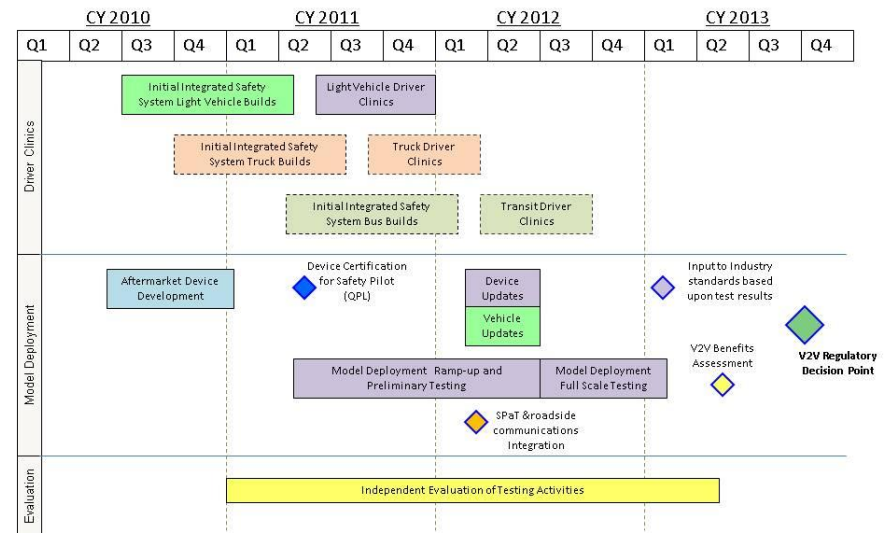
For More Information…..

- Vehicle-to-Vehicle Program Achievements
    - John Harding & Alrik Svenson
- Human Factors for IntelliDrive
    - Stephanie Binder

- www.intellidriveusa.org
- www.nhtsa.gov
- Vehicle Safety Rulemaking and Research Priority Plan for 2009–2011
- www.regulations.gov
- Docket No. NHTSA-2009-0108

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