IntelliDrive^{SM}
Program Overview

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What is IntelliDrive?

IntelliDrive^{SM} is a suite of technologies and applications that use wireless communications to provide connectivity:

- Among vehicles of all types
- Between vehicles and roadway infrastructure
- Among vehicles, infrastructure and wireless consumer devices

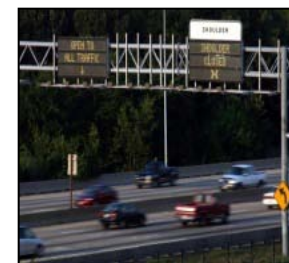**To Improve Safety, Mobility and Environment**

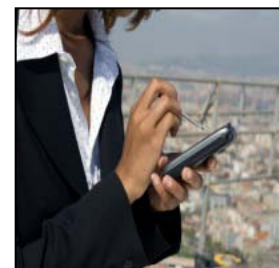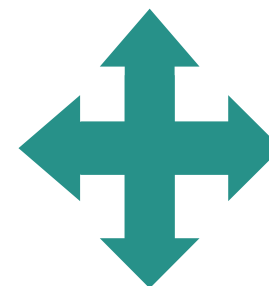FCC Allocated Spectrum at 5.9 GHz for Transportation Safety (known as DSRC)
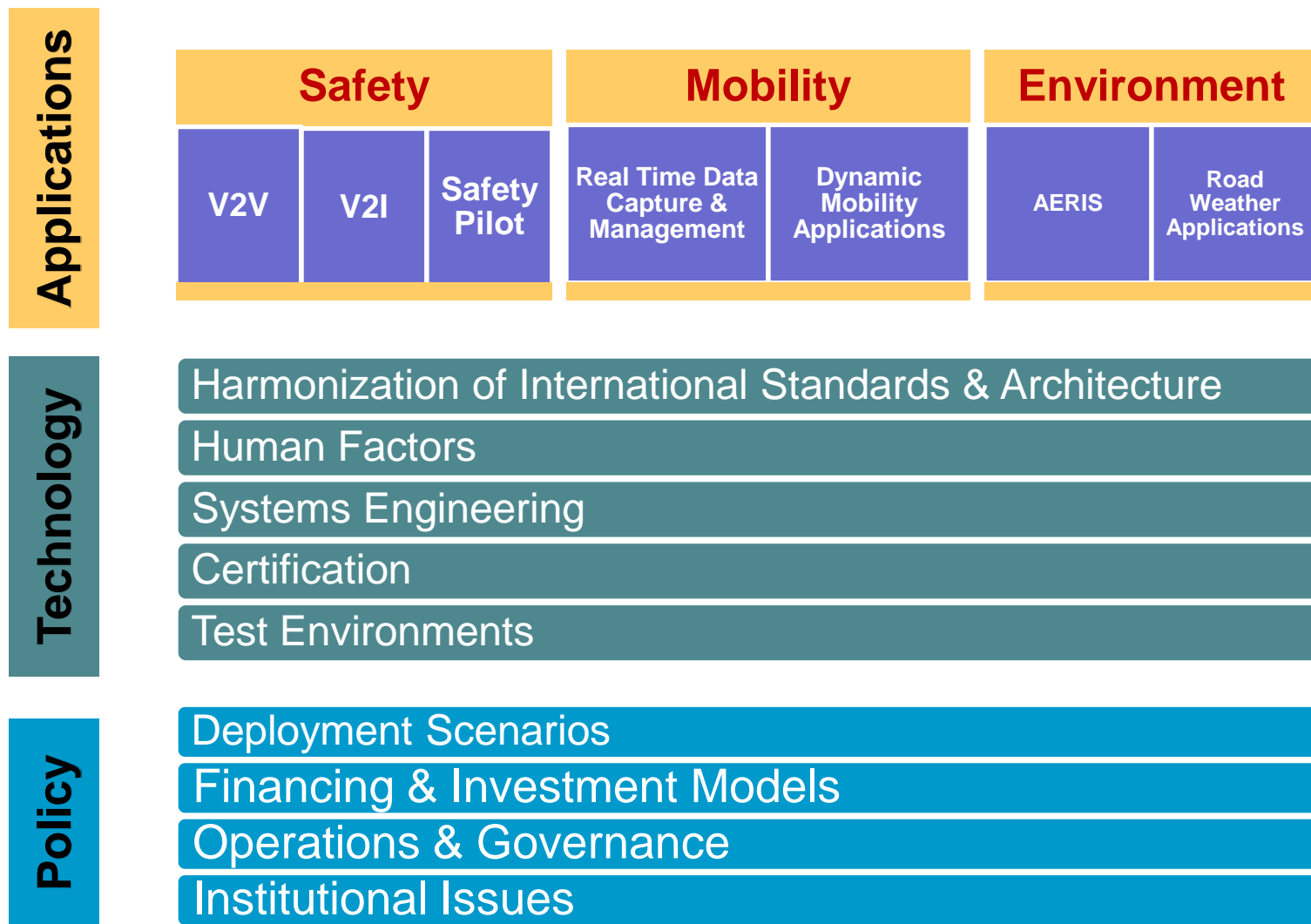
Drivers

Vehicles
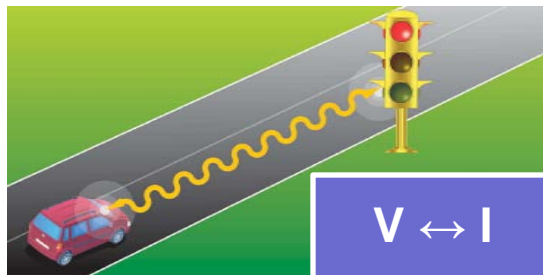
Infrastructure

Wireless Devices

Major IntelliDrive Objectives

- Move aggressively on vehicle to vehicle communications
  - Regulatory Decision on In-Vehicle Equipment by 2013
- Accelerate in-vehicle technology
  - "Here I Am" messages
  - Aftermarket Safety Systems
  - Enables safety and active traffic management
- Accelerate infrastructure communications capability
  - Signal Phase and Timing (SPaT) as initial focus
  - Enables safety, mobility, and environmental applications
- On road multi-modal pilot deployments for high-value applications
- Monitor and evaluation of driver distraction issues
- Understand benefits and communications needs (DSRC/other) of transformative mobility applications

IntelliDrive^{SM} Program Structure

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

IntelliDrive

IntelliDrive Safety Program Areas

V↔V

V ↔ I
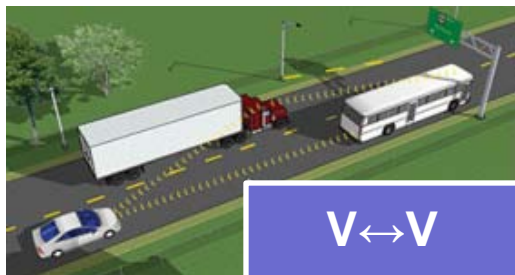
Crash Avoidance Applications
Core Supporting Technologies

Human Factors

Safe Driver Interfaces

HIA / Aftermarket

Accelerating Testing & Deployment

Safety Pilot

Deployment

Cross-Cutting Areas | **Policy** | **Standards / Harmonization** | **Security** | **Certification**
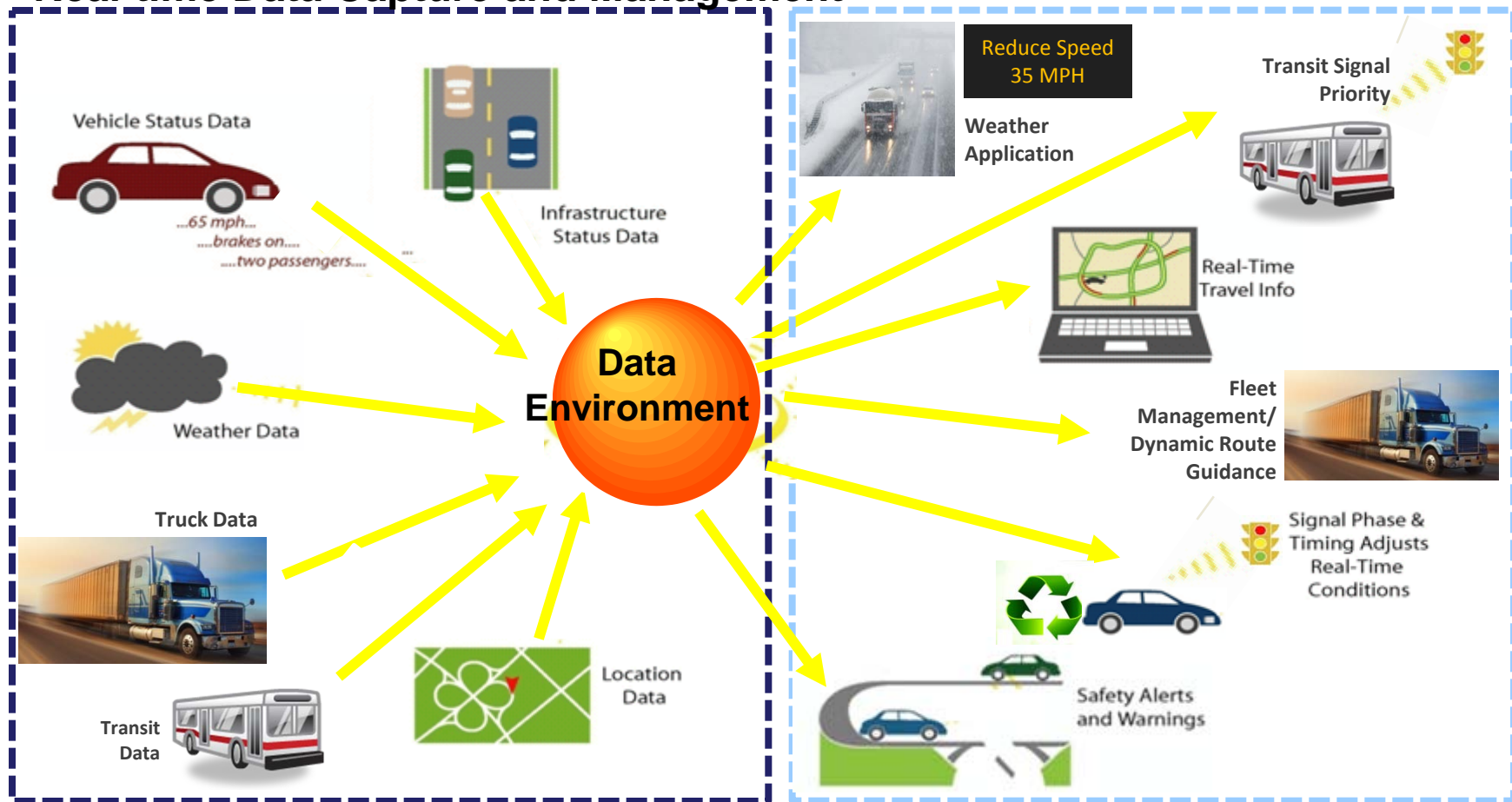
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Safety Research Issues

- Penetration vs. Effectiveness
- Driver Acceptance
- Data Security
- Positioning
- Scalability
- Channel Switching

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IntelliDrive Mobility

AERIS: Research Goal and Objectives

Ultimate "Stretch" Research Goal
> **Transform** environmental management of the transportation system.

Objectives
> To investigate whether it is **possible and feasible** to generate/capture **environmentally-relevant real-time transportation data** (from vehicles and the system), and use this data to create **actionable information** that can then be used by system **users and operators** to support and facilitate **"green" transportation choices** for **all modes**.
>
> **Assess** whether doing these things yields a good enough environmental benefit to **justify further investment**.

AERIS Basic Research Question

Three general, overarching questions:

Data

What environmentally-relevant vehicle-based data is available, and what is its quality and validity? (<u>All types</u> of vehicles)
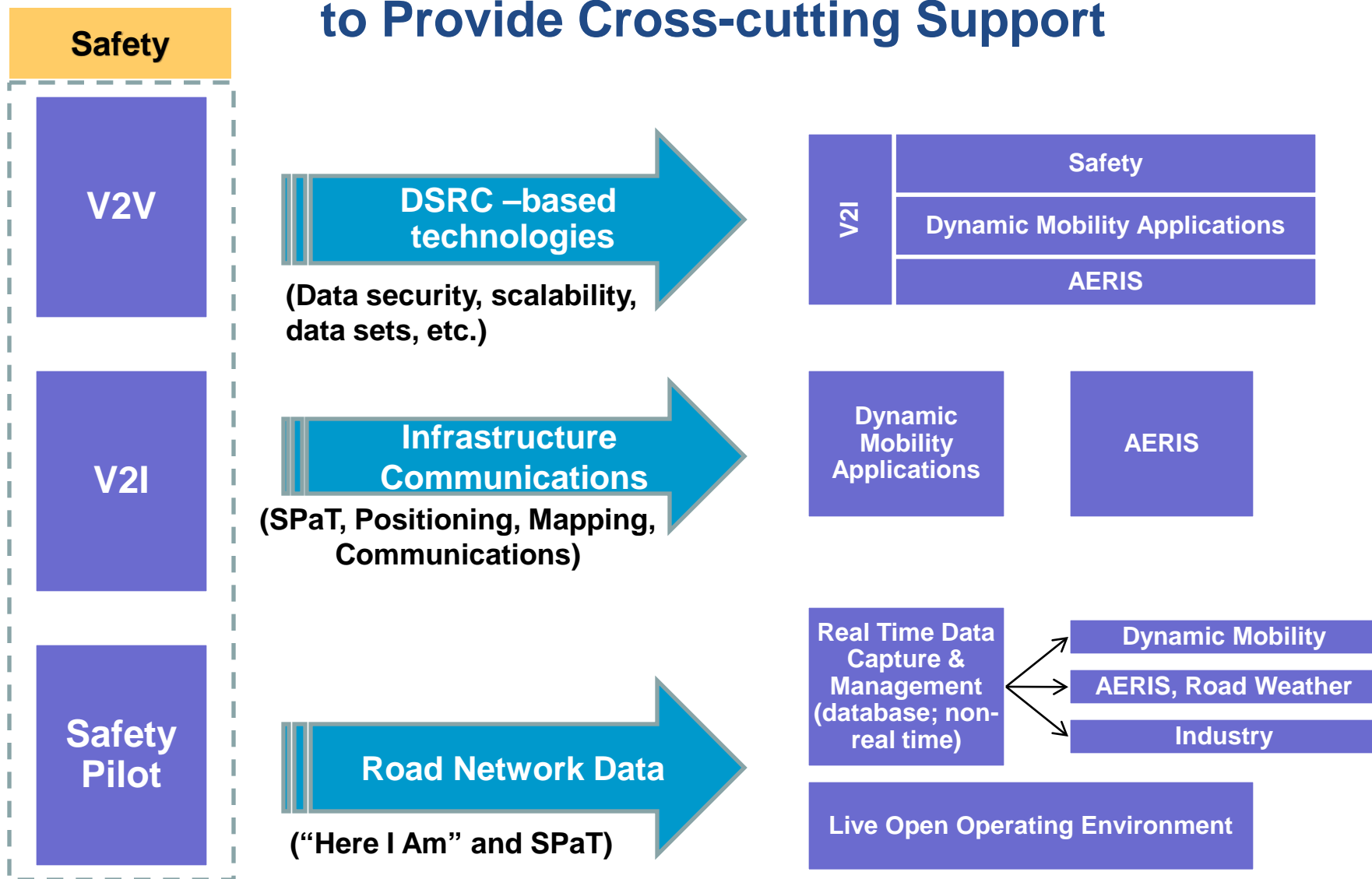
Information/Connectivity

How can vehicle-based data be used and integrated with existing transportation system operation and other data (such as road weather data, for example)?
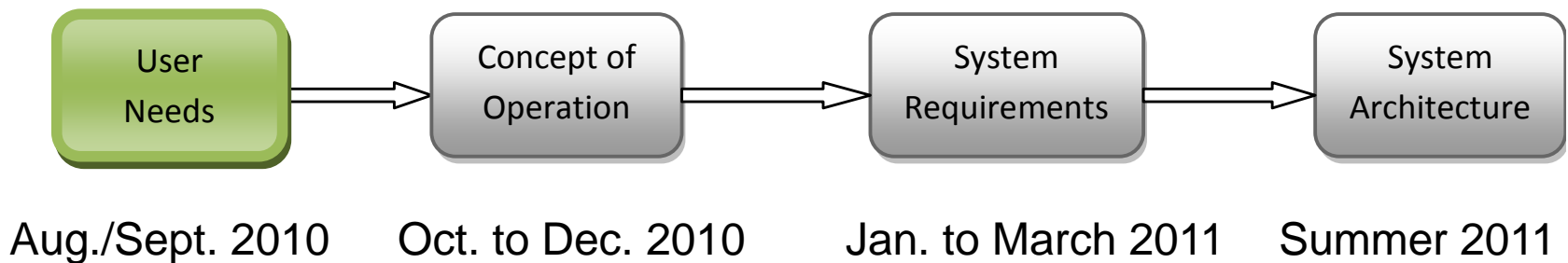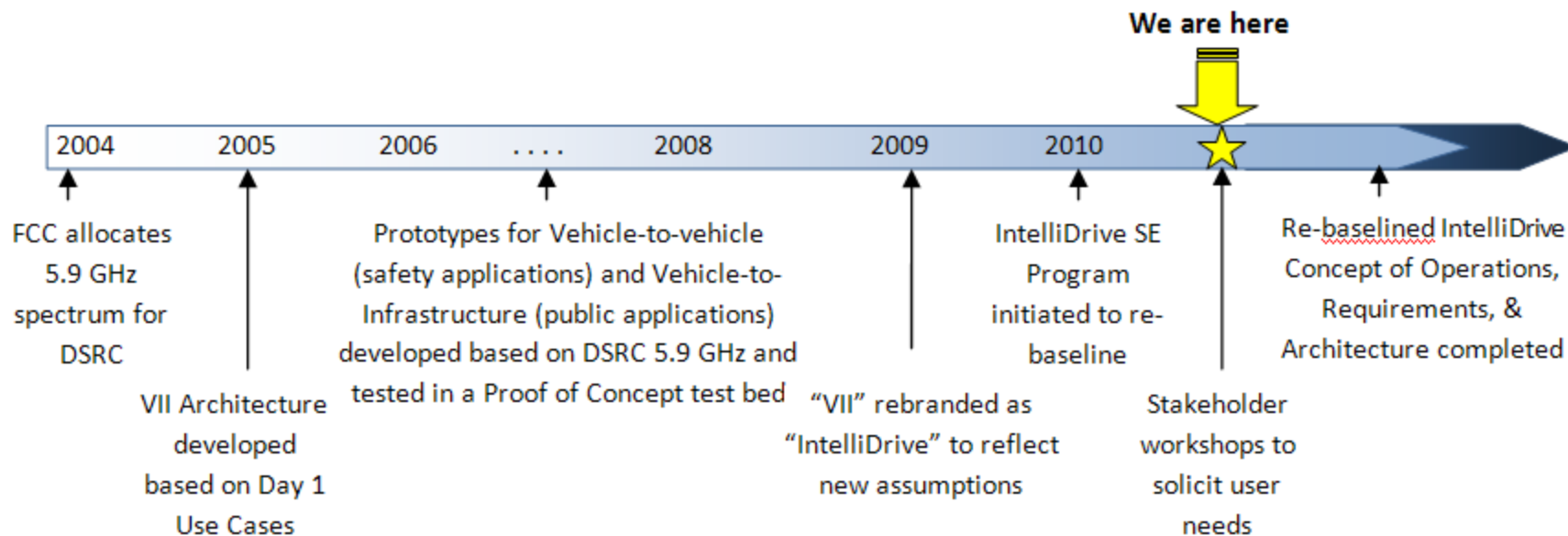
Benefit

What <u>cross-modal</u> <u>public-sector oriented</u> applications/strategies are available, or could be available/developed, and what are their expected benefits?

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Leveraging Safety Program Activities to Provide Cross-cutting Support

Safety

V2V

V2I

Safety Pilot

DSRC –based technologies

(Data security, scalability, data sets, etc.)

Infrastructure Communications

(SPaT, Positioning, Mapping, Communications)

Road Network Data

("Here I Am" and SPaT)

V2I	Safety
	Dynamic Mobility Applications
	AERIS

Dynamic Mobility Applications

AERIS

Real Time Data Capture & Management (database; non-real time)

Dynamic Mobility

AERIS, Road Weather

Industry

Live Open Operating Environment

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IntelliDrive Systems Engineering

We are here

2004	2005	2006	. . . .	2008	2009	2010	

FCC allocates 5.9 GHz spectrum for DSRC

VII Architecture developed based on Day 1 Use Cases

Prototypes for Vehicle-to-vehicle (safety applications) and Vehicle-to-Infrastructure (public applications) developed based on DSRC 5.9 GHz and tested in a Proof of Concept test bed

"VII" rebranded as "IntelliDrive" to reflect new assumptions

IntelliDrive SE Program initiated to re-baseline

Stakeholder workshops to solicit user needs

Re-baselined IntelliDrive Concept of Operations, Requirements, & Architecture completed

User Needs	→	Concept of Operation	→	System Requirements	→	System Architecture

Aug./Sept. 2010   Oct. to Dec. 2010   Jan. to March 2011   Summer 2011

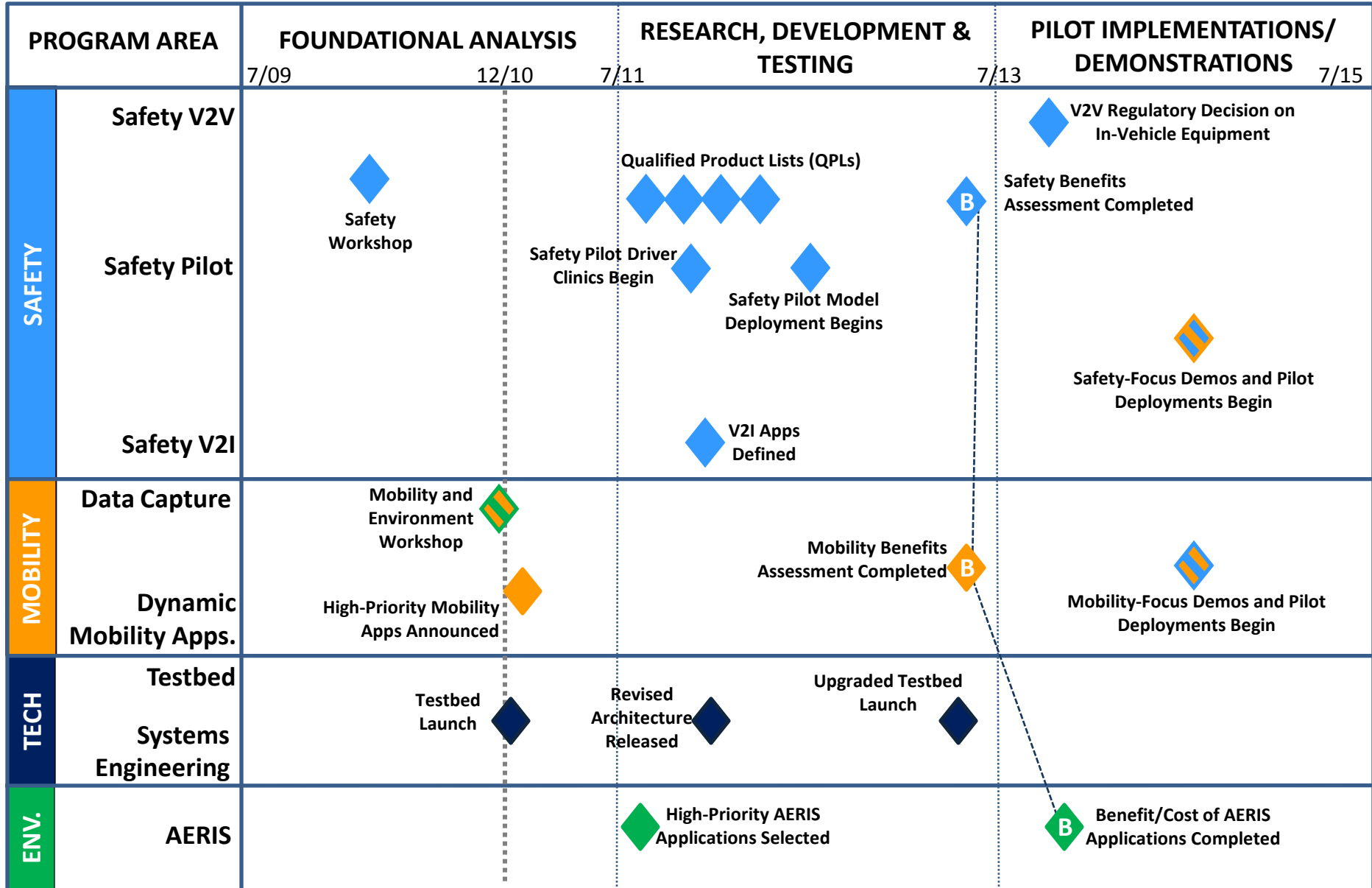# IntelliDrive Testbed – Available January, 2011
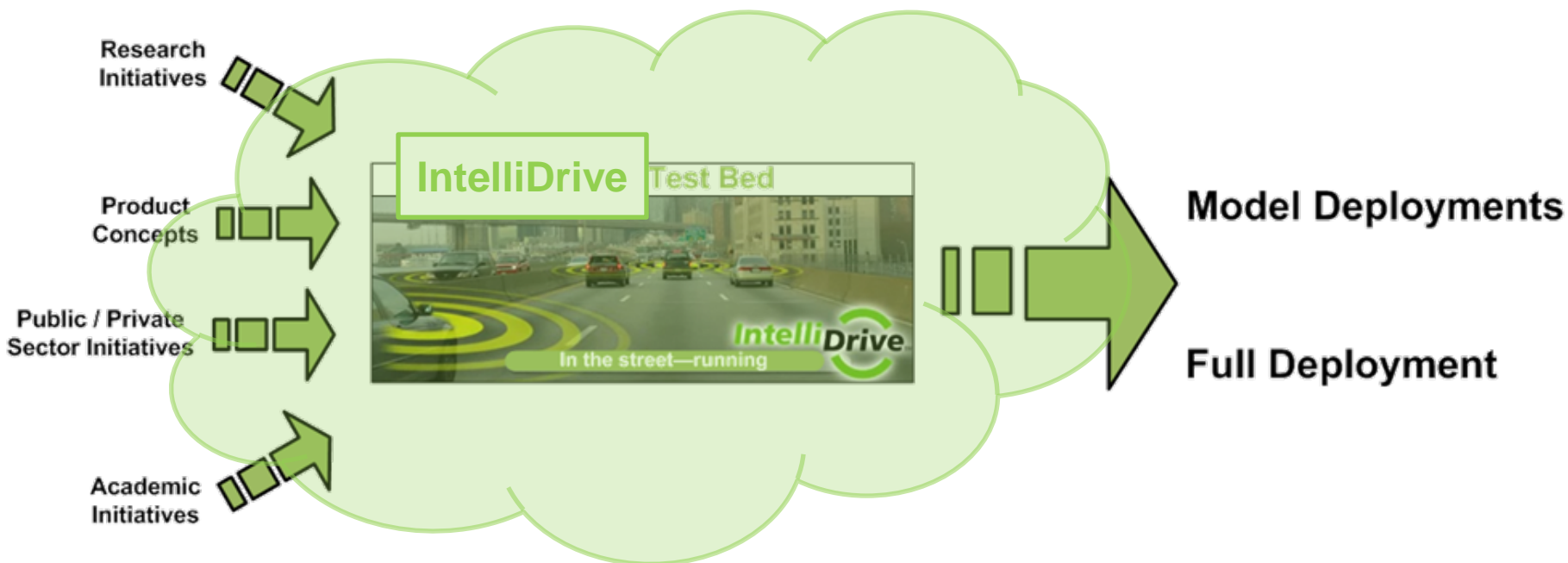
"In the street – running"

Reference Implementation of IntelliDrive System Architecture - 2012

DRAFT

Major IntelliDrive^{SM} Milestones

PROGRAM AREA	FOUNDATIONAL ANALYSIS	RESEARCH, DEVELOPMENT & TESTING	PILOT IMPLEMENTATIONS/ DEMONSTRATIONS

Timeline: 7/09 — 12/10 — 7/11 — 7/13 — 7/15

SAFETY

- Safety V2V — V2V Regulatory Decision on In-Vehicle Equipment
- Safety Pilot — Safety Workshop; Qualified Product Lists (QPLs); Safety Pilot Driver Clinics Begin; Safety Pilot Model Deployment Begins; Safety Benefits Assessment Completed (B); Safety-Focus Demos and Pilot Deployments Begin
- Safety V2I — V2I Apps Defined

MOBILITY

- Data Capture — Mobility and Environment Workshop
- Dynamic Mobility Apps. — High-Priority Mobility Apps Announced; Mobility Benefits Assessment Completed (B); Mobility-Focus Demos and Pilot Deployments Begin

TECH

- Testbed — Testbed Launch; Revised Architecture Released; Upgraded Testbed Launch
- Systems Engineering

ENV.

- AERIS — High-Priority AERIS Applications Selected; Benefit/Cost of AERIS Applications Completed (B)

Today and Tomorrow: Key Themes

- Tech Neutrality
  - *DSRC and More*
  - Use DSRC where it makes sense, don't use it where it does not
- Coordinated Research and Development
  - Collect quality data once, develop many applications
  - Safety-Mobility-AERIS
- Transparency and Ongoing Stakeholder Engagement
  - Open Data
  - Open Source Development
- Widely Available Program Products
  - Data and Applications Portal
  - Knowledge Management Portal

For More Information…

http://www.intellidrive.org/