IntelliDrive^SM
Dynamic Mobility Applications Program

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

Outline

- Program Vision and Objectives
- Current Program Overview
- Guiding Principles
- Current Projects and Products
- Next Steps
- Questions

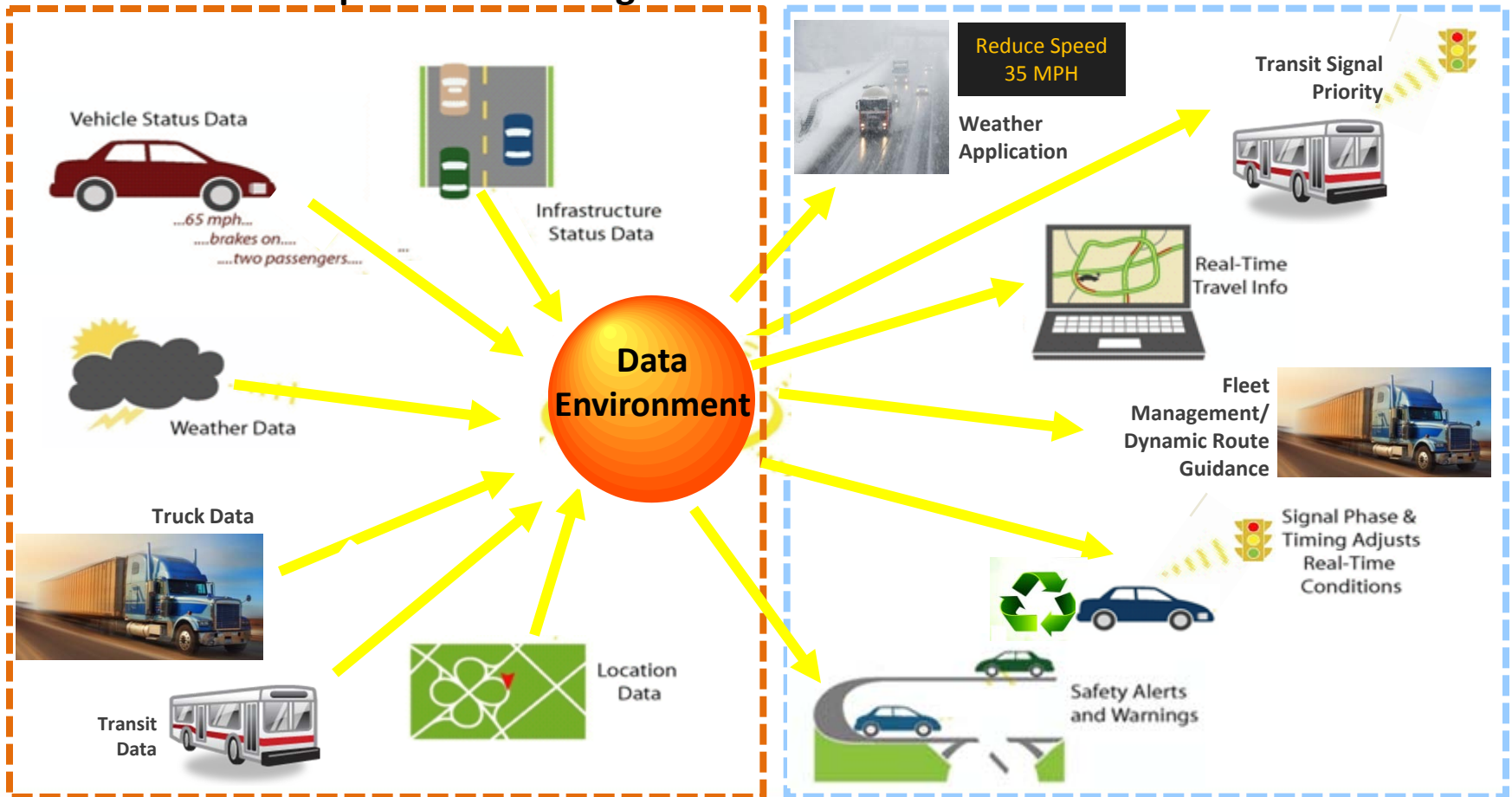# *Program Vision and Objectives*

Dynamic Mobility Applications

Vision

- Expedite development, testing, commercialization, and deployment of innovative mobility applications that:
  - maximize system productivity
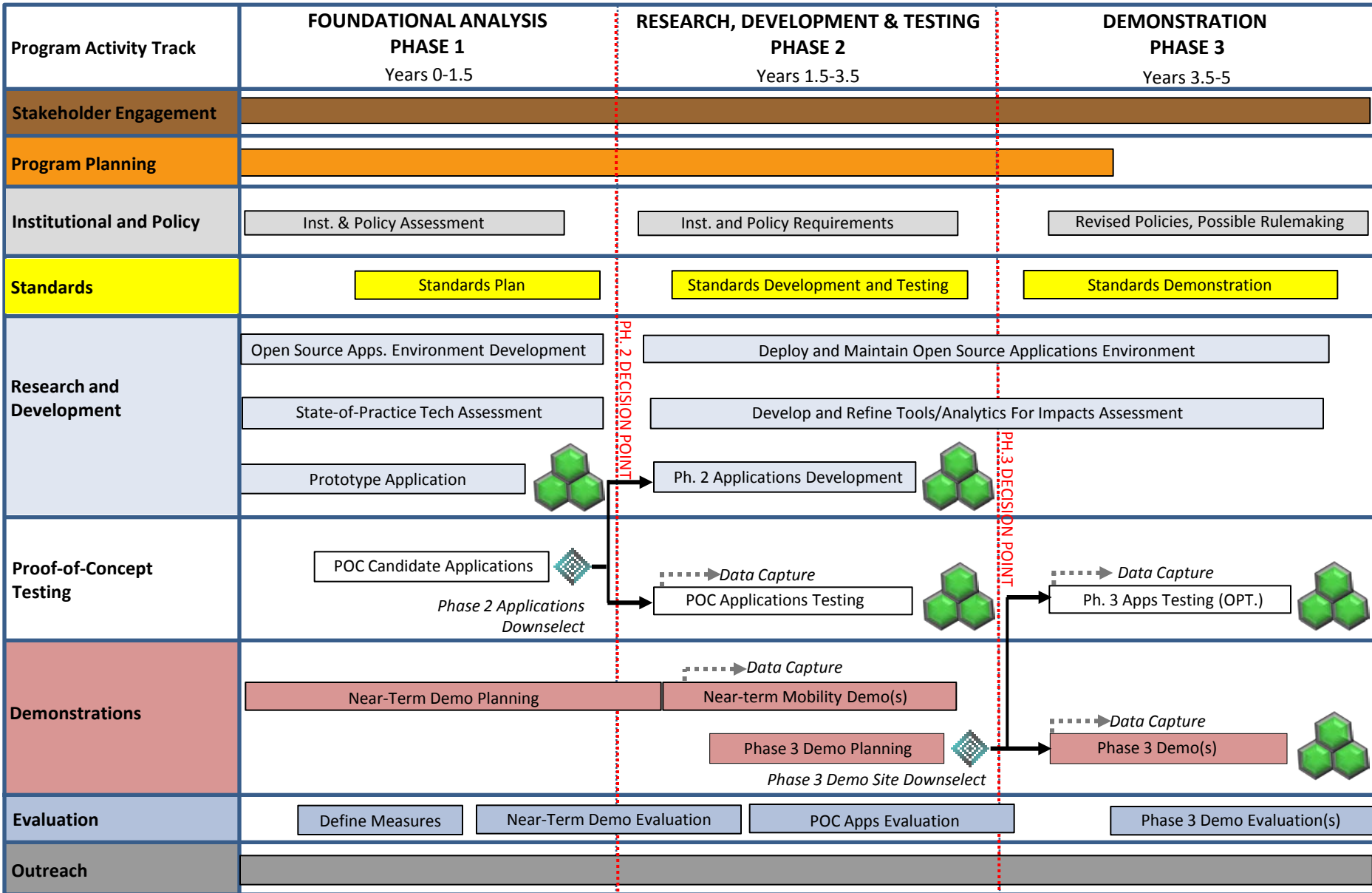 - enhance mobility of individuals within the system

Objectives

- Create applications using frequently collected and rapidly disseminated multi-source data from connected travelers, vehicles (automobiles, transit, freight) and infrastructure

- Develop and assess applications showing potential to improve nature, accuracy, precision and/or speed of dynamic decision making by system managers and system users

- Demonstrate promising applications predicted to significantly improve capability of transportation system to provide safe, reliable, and secure movement of goods and people

Current Program Overview

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IntelliDrive^{SM} Dynamic Mobility Applications Program High-Level Roadmap

Program Activity Track	FOUNDATIONAL ANALYSIS PHASE 1 Years 0-1.5	RESEARCH, DEVELOPMENT & TESTING PHASE 2 Years 1.5-3.5	DEMONSTRATION PHASE 3 Years 3.5-5
Stakeholder Engagement			
Program Planning			
Institutional and Policy	Inst. & Policy Assessment	Inst. and Policy Requirements	Revised Policies, Possible Rulemaking
Standards	Standards Plan	Standards Development and Testing	Standards Demonstration
Research and Development	Open Source Apps. Environment Development	Deploy and Maintain Open Source Applications Environment	
	State-of-Practice Tech Assessment	Develop and Refine Tools/Analytics For Impacts Assessment	
	Prototype Application	Ph. 2 Applications Development	
Proof-of-Concept Testing	POC Candidate Applications	*Data Capture* POC Applications Testing	*Data Capture* Ph. 3 Apps Testing (OPT.)
	Phase 2 Applications Downselect		
Demonstrations	Near-Term Demo Planning	*Data Capture* Near-term Mobility Demo(s)	
		Phase 3 Demo Planning	*Data Capture* Phase 3 Demo(s)
		Phase 3 Demo Site Downselect	
Evaluation	Define Measures	Near-Term Demo Evaluation / POC Apps Evaluation	Phase 3 Demo Evaluation(s)
Outreach			

PH. 2 DECISION POINT

PH.3 DECISION POINT

Do the candidate applications show enough promise to be tested? Do these applications address key performance measures? Do we understand the communications requirements of these applications?

Are there clear and compelling arguments for deployments showing significant benefits?

LEGEND: Decision point | Program Activity | *Data Capture* Data Feed | Open Source Applications

Projected Program Outcomes

- Multiple applications developed leveraging multi-source data
- Research spurs commercialization
- Applications enable transformational change

Guiding Principles

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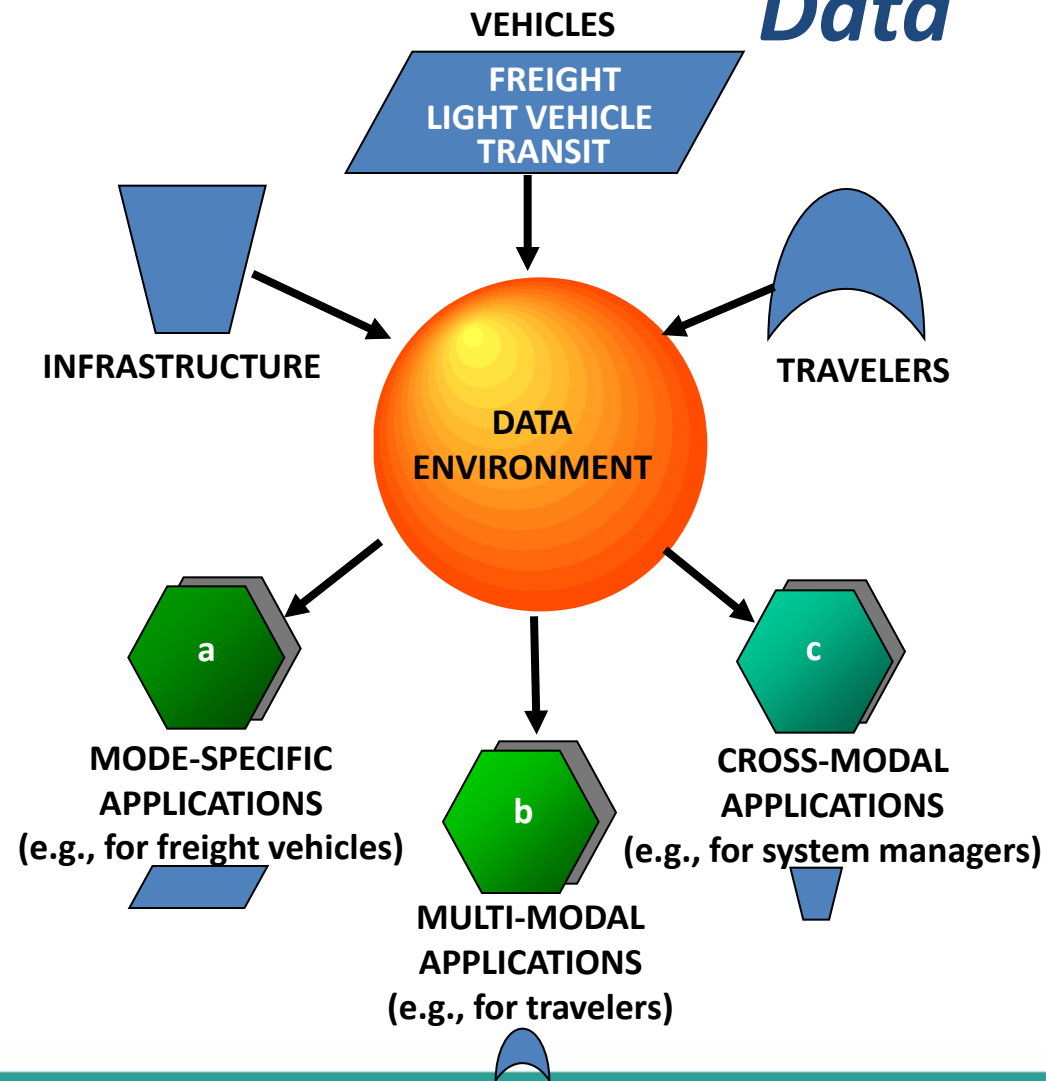
Guiding Principles

- Leverage multi-source data
- Develop and test mode-specific and multi-modal applications
- Feature open source application research and development
- Encourage competitive application commercialization
- Prioritize program resources based on expected impact
- Enhance analytical capabilities related to mobility applications
- Practice long-term technology stewardship

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Leverage Multi-Source Data

- Leverage high-quality data integrated from mobile and fixed sources to develop multiple applications (mode-specific and multi-modal)

- Requires coordination with Real-Time Data Capture and Management program

VEHICLES

FREIGHT LIGHT VEHICLE TRANSIT

INFRASTRUCTURE

TRAVELERS

DATA ENVIRONMENT

a

MODE-SPECIFIC APPLICATIONS
(e.g., for freight vehicles)

b

MULTI-MODAL APPLICATIONS
(e.g., for travelers)

c

CROSS-MODAL APPLICATIONS
(e.g., for system managers)

Multi-Modal Applications Development and Test

- Coordinated development of mode-specific and multi-modal applications:
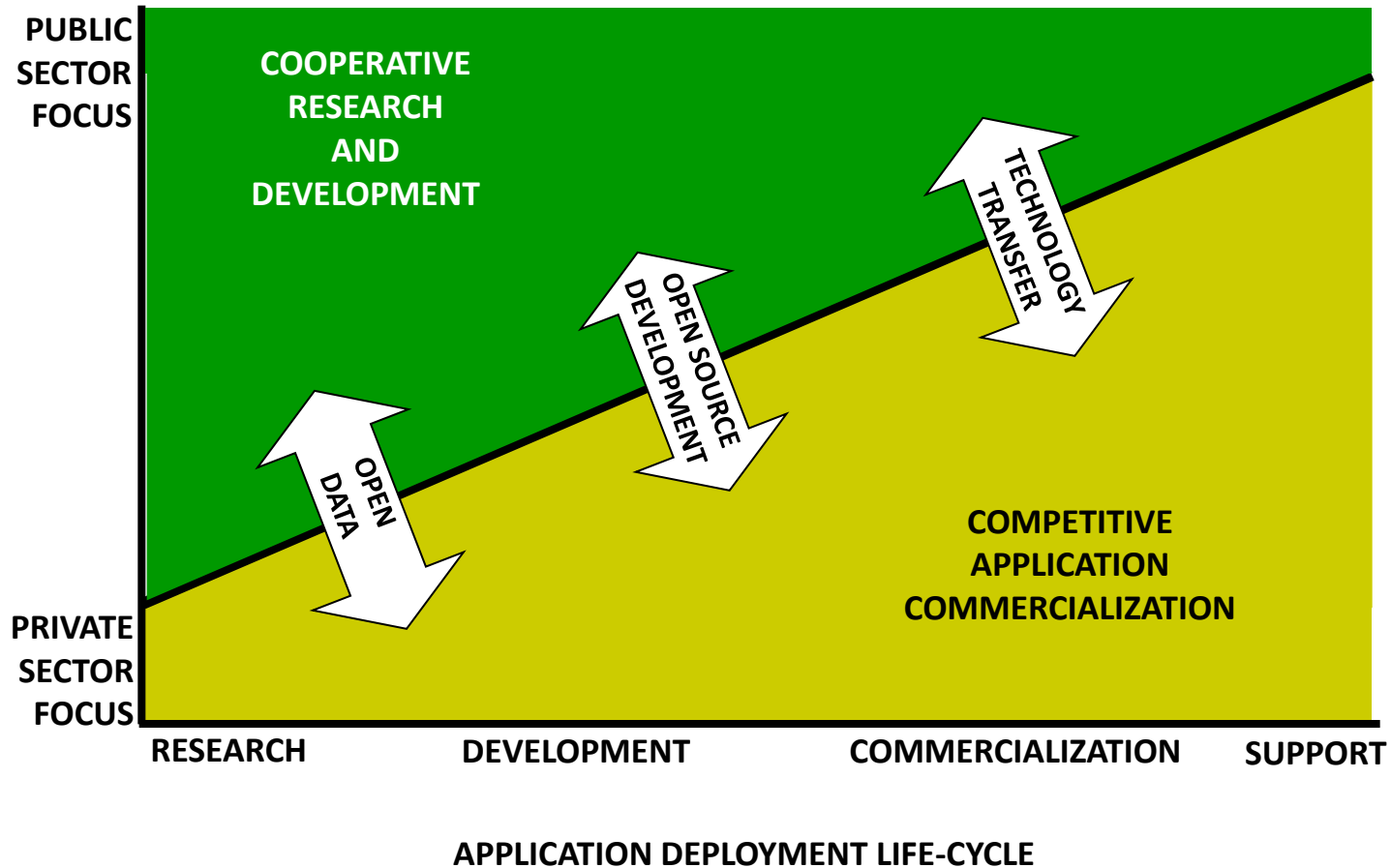 - avoid duplication
  - cost-effective
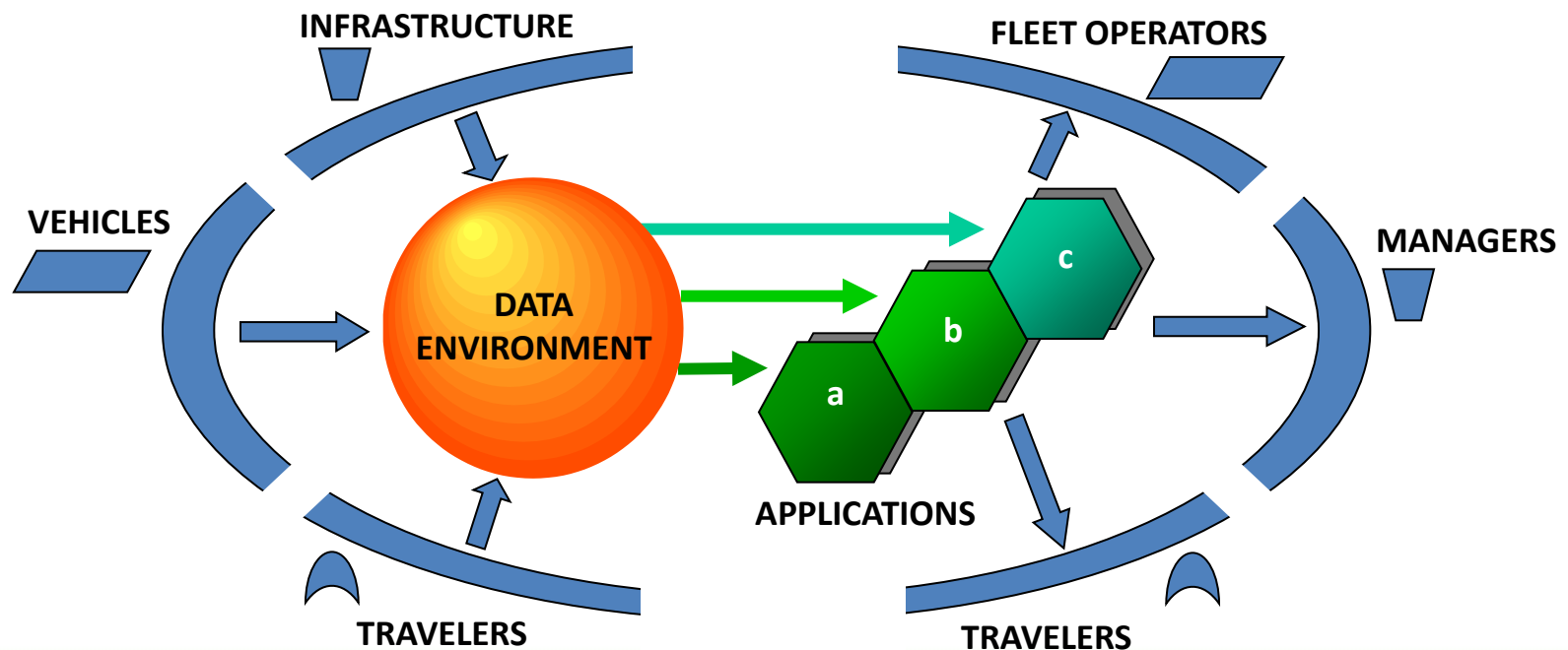
Open Source Research and Development

- Research issue is too complex or big for isolated researchers to solve

- Promotes highest level of collaboration

- Preserves intellectual capital

- Serves to engage partners from academia and industry who may not be directly involved in funded applications development and testing

- Currently seeking to refine how best to structure open source agreements
  - maximize collaboration
  - without reducing innovation or endangering commercialization

Prioritize resources based on expected impact

- Develop prototype mobility application that focuses on performance measures:
  - exploits new or integrated data sources
  - enhances traditional measures or creates new measures to capture full impact of mobility applications
- Prioritization of development and test of candidate applications:
  - applications must improve system productivity or user mobility
  - well-defined, quantitative performance measures (multi-modal or mode independent)
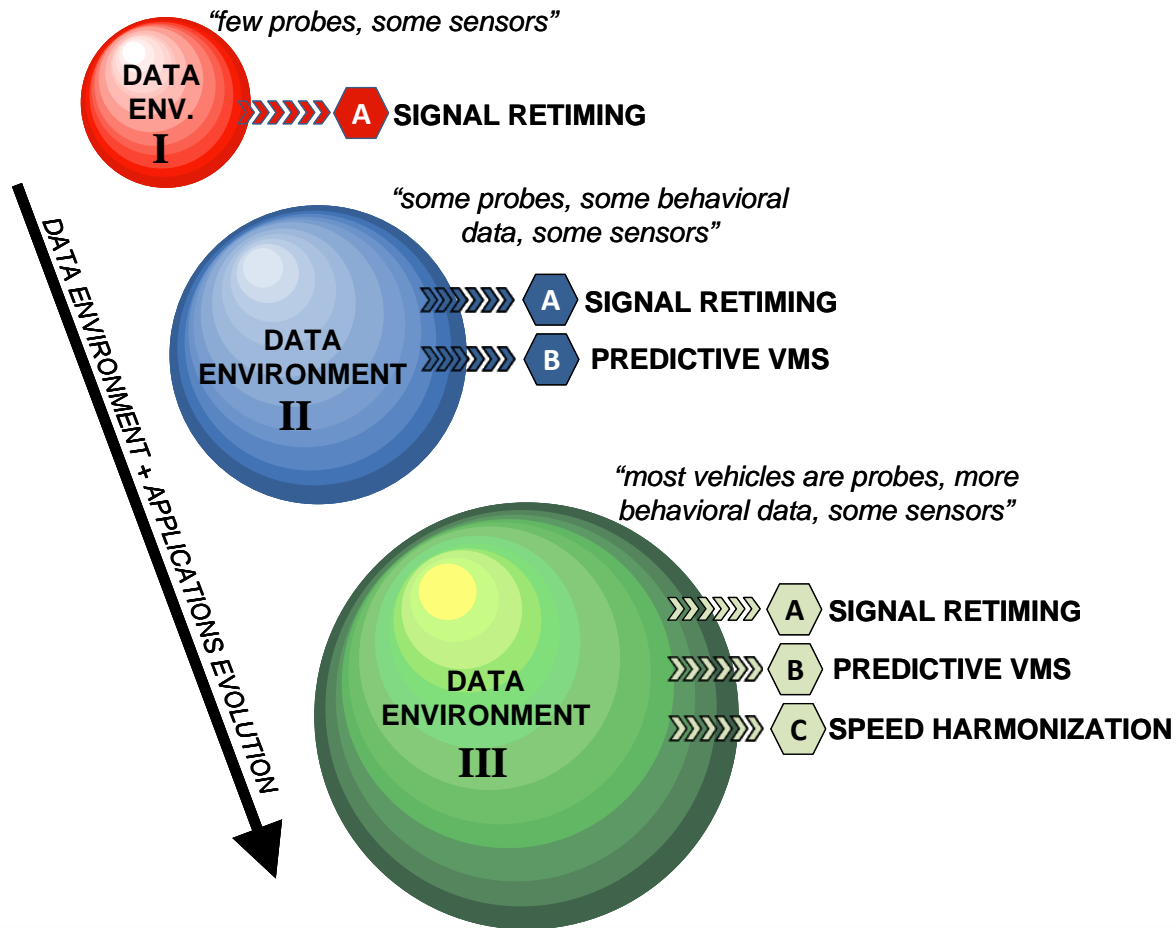 - applications must have broad stakeholder interest and support

Enhance analytical capabilities

- Develop analytic tools and processes to accurately predict impacts:
  - assess long-term performance
  - use real-time prediction to support improved decision making by travelers, system managers and other transportation system stakeholders (e.g., fleet operators)
- Employ tools to refine and identify promising applications prior to committing resources for field testing or full demonstration

Practice long-term technology stewardship

"few probes, some sensors"

DATA ENV. I → **A** SIGNAL RETIMING

"some probes, some behavioral data, some sensors"

DATA ENVIRONMENT II → **A** SIGNAL RETIMING
→ **B** PREDICTIVE VMS

"most vehicles are probes, more behavioral data, some sensors"

DATA ENVIRONMENT III → **A** SIGNAL RETIMING
→ **B** PREDICTIVE VMS
→ **C** SPEED HARMONIZATION

DATA ENVIRONMENT + APPLICATIONS EVOLUTION

Keys to Success for IntelliDrive Mobility

- Facilitate easy, secure access to data environment and enable collaboration in mobility application development

- Accumulate and share intellectual capital while respecting IP rights

- Coordination with other IntelliDrive program areas and broader ITS programs

- Active interaction with broader group of stakeholders outside the federal research and development efforts

- Not a one-time engagement, will require ongoing collaboration to:
  - refine program goals
  - refine data needs
  - structure relevant and feasible data environment development efforts
  - prioritize applications development and testing

Current Projects and Products

Current Projects and Products

- Current Projects
  - Policy Assessment*
  - Standards Assessment*
  - Open Source Portal
    - USDOT Lead: Randy Butler (FHWA, Office of Freight)
    - Principal Investigator: Ron Schaefer (SAIC)
  - Decision Support Systems
    - USDOT Lead: Dale Thompson (FHWA R&D)
    - Principal Investigator: Dan Lukasik (Delcan)

- Available Program Products
  - Program vision, other documents on IntelliDrive website
  - Candidate mobility applications concepts site

*Joint activity with Data Capture and Management Program

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Candidate Applications Concepts

Goal

- Identify, with help of stakeholders, collection of applications for development and testing in Phase 2 of Program

Approach

- Solicit ideas for transformative applications that improve decision making by system managers and users
  - Initial request closed on 31 July; second call closed 15 October
  - More than 90 submittals received
- Summaries are available on the web:
  - http://dma.noblis.org
- We will be using a consolidated version of these concepts during the upcoming breakouts in this workshop

Candidate Applications Prioritization Criteria

- Potential for transformative impact
- Makes use of IntelliDrive data
- Significant stakeholder interest
  - Your input from this workshop is one measure of stakeholder interest
- Can evolve from near-term state to long-term state
- Potential to be released as open source
- Cross-modal impact

Next Steps

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- *Precise nature, extent and timing are not yet known, however, the program expects to procure assistance in the following two areas:*
  - Analytical Needs Assessment
    - Enhance current or develop new methods to estimate impacts of Phase 2 Applications
  - Applications Development and Field Testing
    - Develop concepts of operations and requirements for promising application concepts
    - Develop and document applications utilizing data environments
    - Consider inputs from stakeholders
    - This workshop is one example
    - Identify high-priority applications
      - *Announcement planned for TRB 2011*

Questions?