Mobility Program Update

Ben McKeever

FHWA Office of Operations R&D

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Mobility Program

Real-time Data Capture and Management

Vehicle Status Data

...65 mph...
.....brakes on.....
....two passengers.....

Infrastructure Status Data

Weather Data

Truck Data

Transit Data

Location Data

Data Environment

Dynamic Mobility Applications

Reduce Speed 35 MPH

Weather Application

Transit Signal Priority

Real-Time Travel Info

Fleet Management/ Dynamic Route Guidance

Signal Phase & Timing Adjusts Real-Time Conditions

Safety Alerts and Warnings
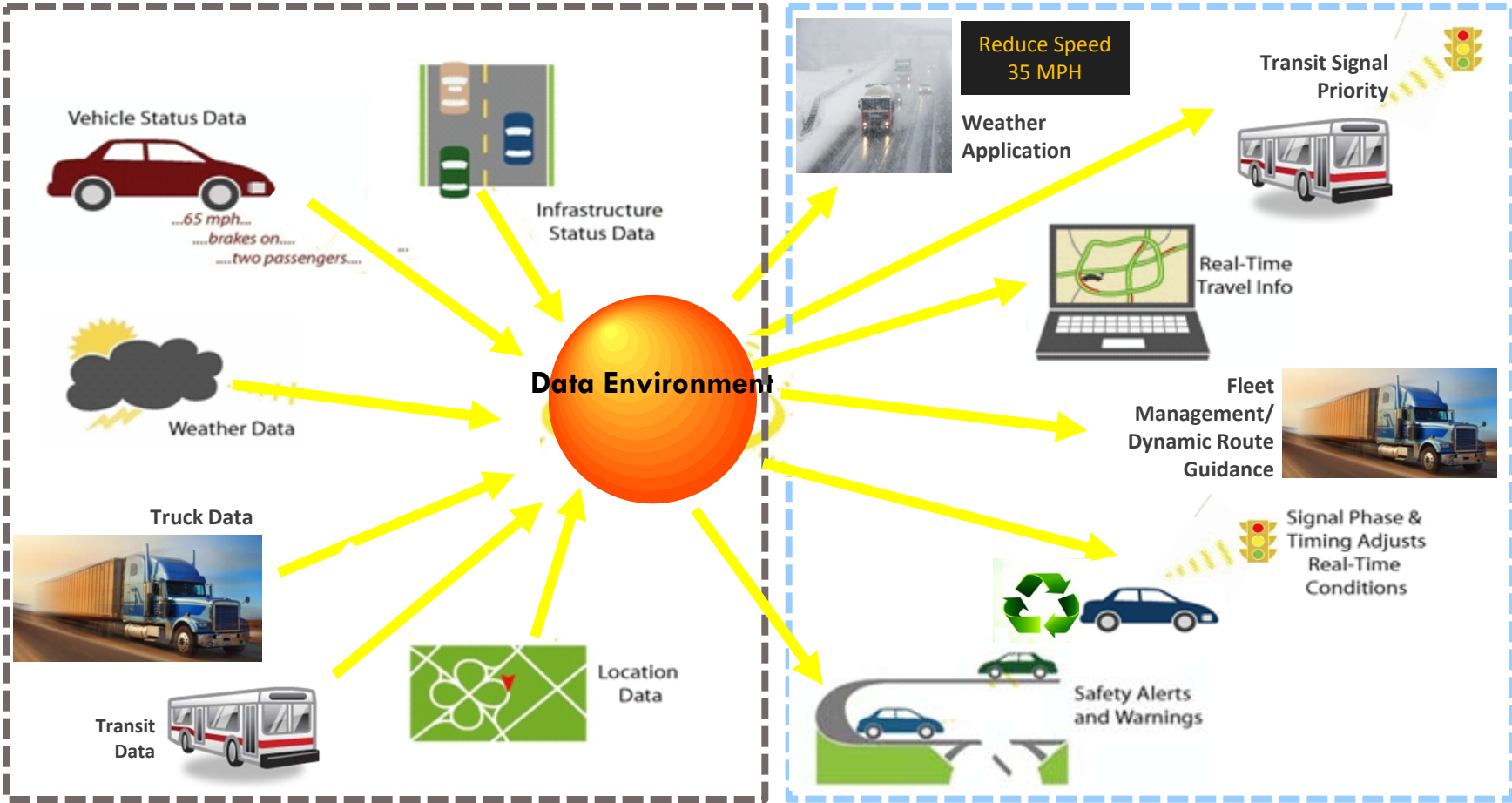
Dynamic Mobility Applications Program

Vision

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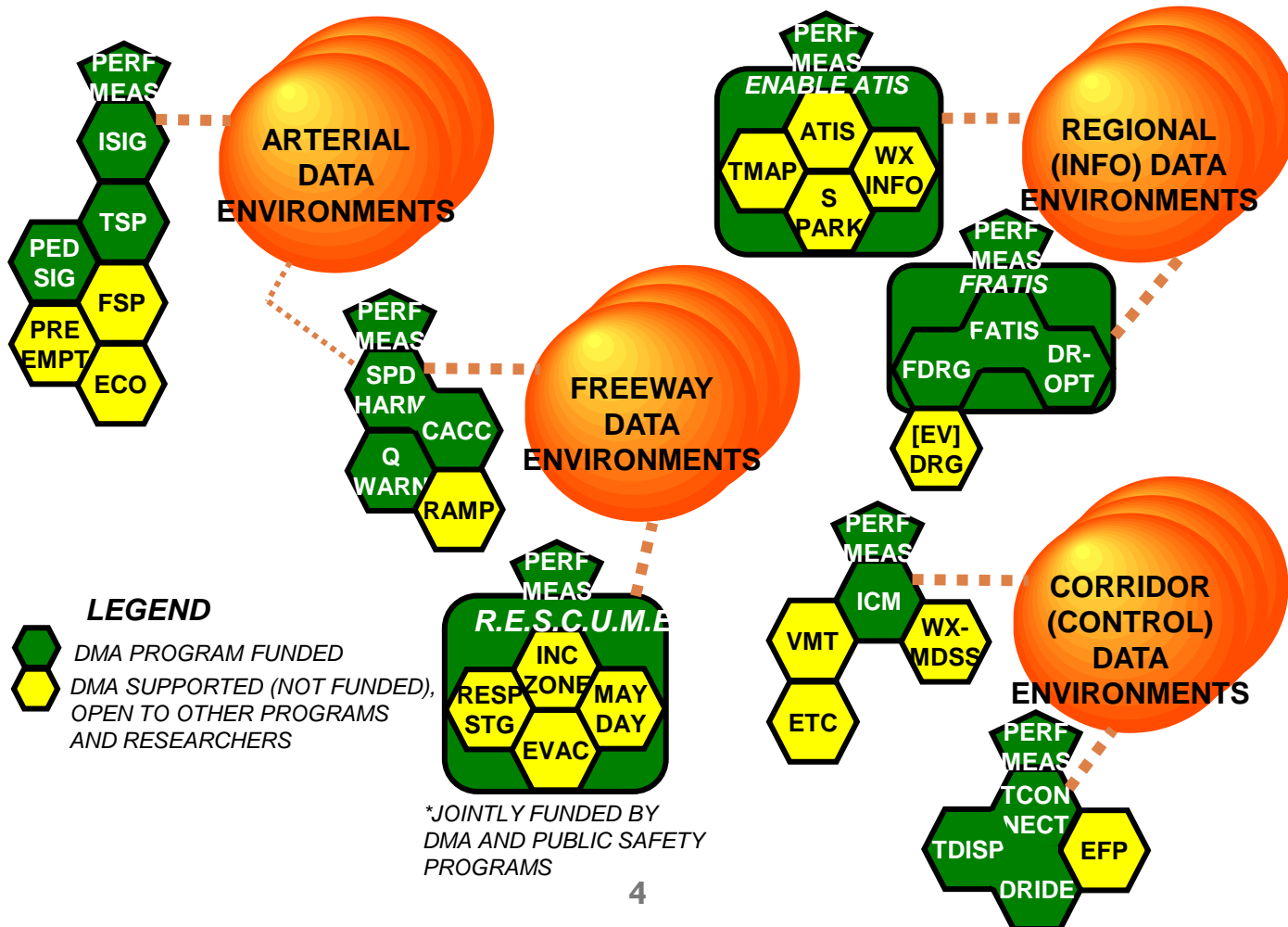 - enhance mobility of individuals within the system

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

High Priority Mobility Applications

93 ideas ➝ 30 applications ➝ 7 bundles

ARTERIAL DATA ENVIRONMENTS

PERF MEAS
ISIG
TSP
PED SIG
FSP
PRE EMPT
ECO

ENABLE ATIS
PERF MEAS
ATIS
TMAP
WX INFO
S PARK

REGIONAL (INFO) DATA ENVIRONMENTS

FRATIS
PERF MEAS
FATIS
FDRG
DR-OPT
[EV] DRG

FREEWAY DATA ENVIRONMENTS

PERF MEAS
SPD HARM
CACC
Q WARN
RAMP

R.E.S.C.U.M.E.
PERF MEAS
INC ZONE
RESP STG
MAY DAY
EVAC

ICM
PERF MEAS
VMT
WX-MDSS
ETC

CORRIDOR (CONTROL) DATA ENVIRONMENTS

PERF MEAS
TCON NECT
TDISP
EFP
DRIDE

LEGEND
- DMA PROGRAM FUNDED
- DMA SUPPORTED (NOT FUNDED), OPEN TO OTHER PROGRAMS AND RESEARCHERS

*JOINTLY FUNDED BY DMA AND PUBLIC SAFETY PROGRAMS*

4

Multi-Modal Intelligent Traffic Signal System (Multi-modal I-SIG)

- Comprehensive traffic signal system for multiple transportation modes (passenger vehicles, transit, pedestrians, freight, and emergency vehicles):

  - Intelligent Traffic Signal System (I-SIG)

  - Transit Signal Priority (TSP)

  - Mobile Accessible Pedestrian Signal System (PED-SIG):

  - Freight Signal Priority (FSP)

  - Emergency Vehicle Preemption (PREEMPT)

- Jointly funded by Pooled Fund Study and USDOT

 - ConOps, system requirements, high-level design, and test plan

PERF MEAS

ISIG

TSP

PED SIG

FSP

PRE EMPT

ECO

ARTERIAL DATA ENVIRONMENTS
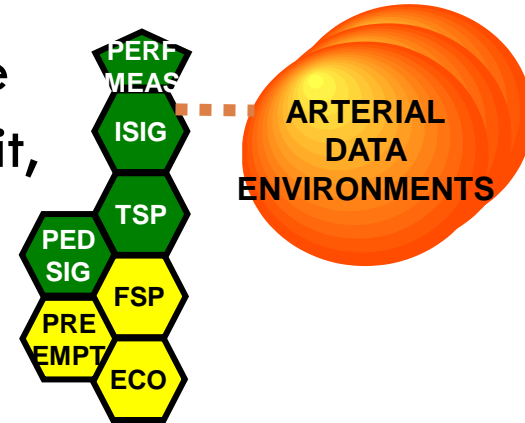
Intelligent Dynamic Transit Operations (IDTO)

☐ Integrated transit operations that provide dynamic scheduling, dispatching, and routing of transit vehicles, and facilitate passenger connection protection and dynamic ridesharing:

   ▫ Dynamic Transit Operations (T-DISP)

   ▫ Connection Protection (T-CONNECT)

   ▫ Dynamic Ridesharing (D-RIDE)

☐ Begin concept development and needs identification in 2011

CORRIDOR (CONTROL) DATA ENVIRONMENTS

PERF MEAS

TCONNECT

TDISP

DRIDE
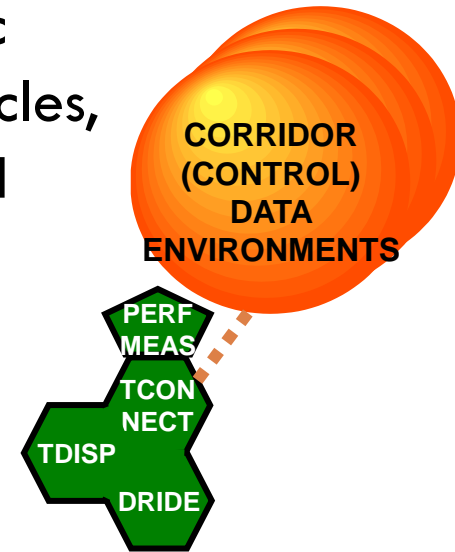
Freight Advanced Traveler Information System (FRATIS)

- Freight traveler information system that provides freight-specific route guidance and optimizes drayage operations so that load movements are coordinated between freight facilities to reduce empty-load trips:

  - Freight Real-Time Traveler Information with Performance Monitoring (F-ATIS)

  - Freight Dynamic Route Guidance (F-DRG)

  - Drayage Optimization (DR-OPT)

- Begin concept development and needs identification in 2011

REGIONAL (INFO) DATA ENVIRONMENTS

PERF MEAS

FRATIS

FATIS

FDRG

DR-OPT
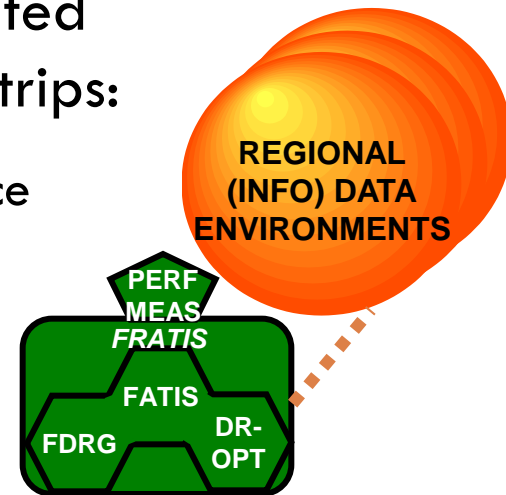
Enable Advanced Traveler Information System (Enable ATIS)

- Advanced traveler information system that integrates multi-source, multi-modal data:

  - Multi-Modal Real-Time Traveler Information (ATIS)

  - Real-Time Route Specific Weather Information for Motorized and Non-Motorized Modes (WX-INFO)

  - Smart Park and Ride (S-PARK)

  - Universal Map Application (T-MAP)

- Begin vision and concept development for transformational traveler information services in 2011

- Establish appropriate federal role

REGIONAL (INFO) DATA ENVIRONMENTS

PERF MEAS

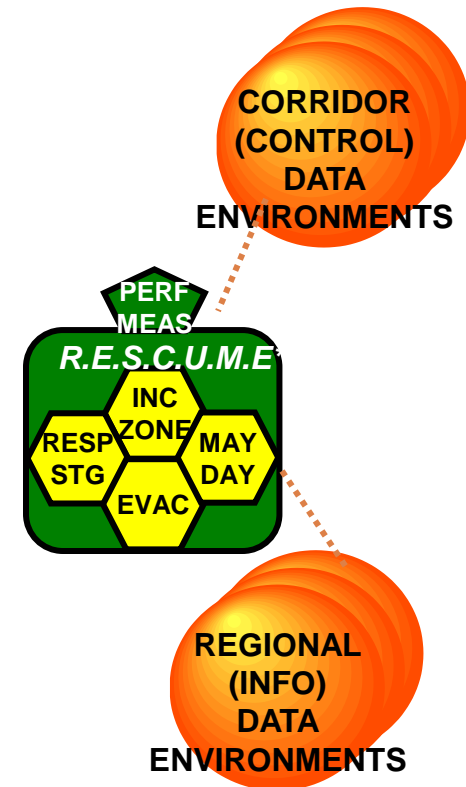ENABLE ATIS

ATIS

TMAP

WX INFO

S PARK
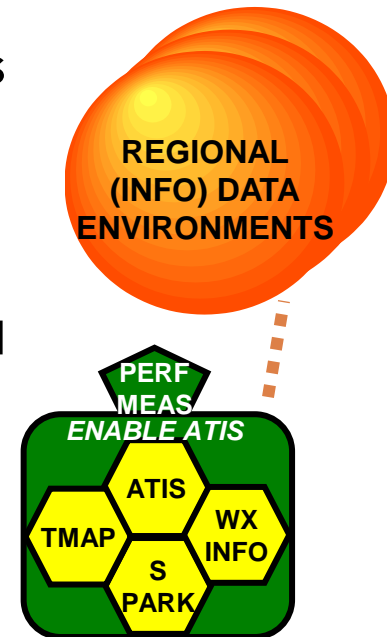
Intelligent Network Flow Optimization (INFLO)

- Network flow optimization application that informs motorists of existing and impending queues and bottlenecks, provides target speeds by location and lane, and allows capability to form *ad hoc* platoons of uniform speed:

  - Queue Warning (Q-WARN)

  - Dynamic Speed harmonization (SPD-HARM)

  - Cooperative Adaptive Cruise Control (CACC)

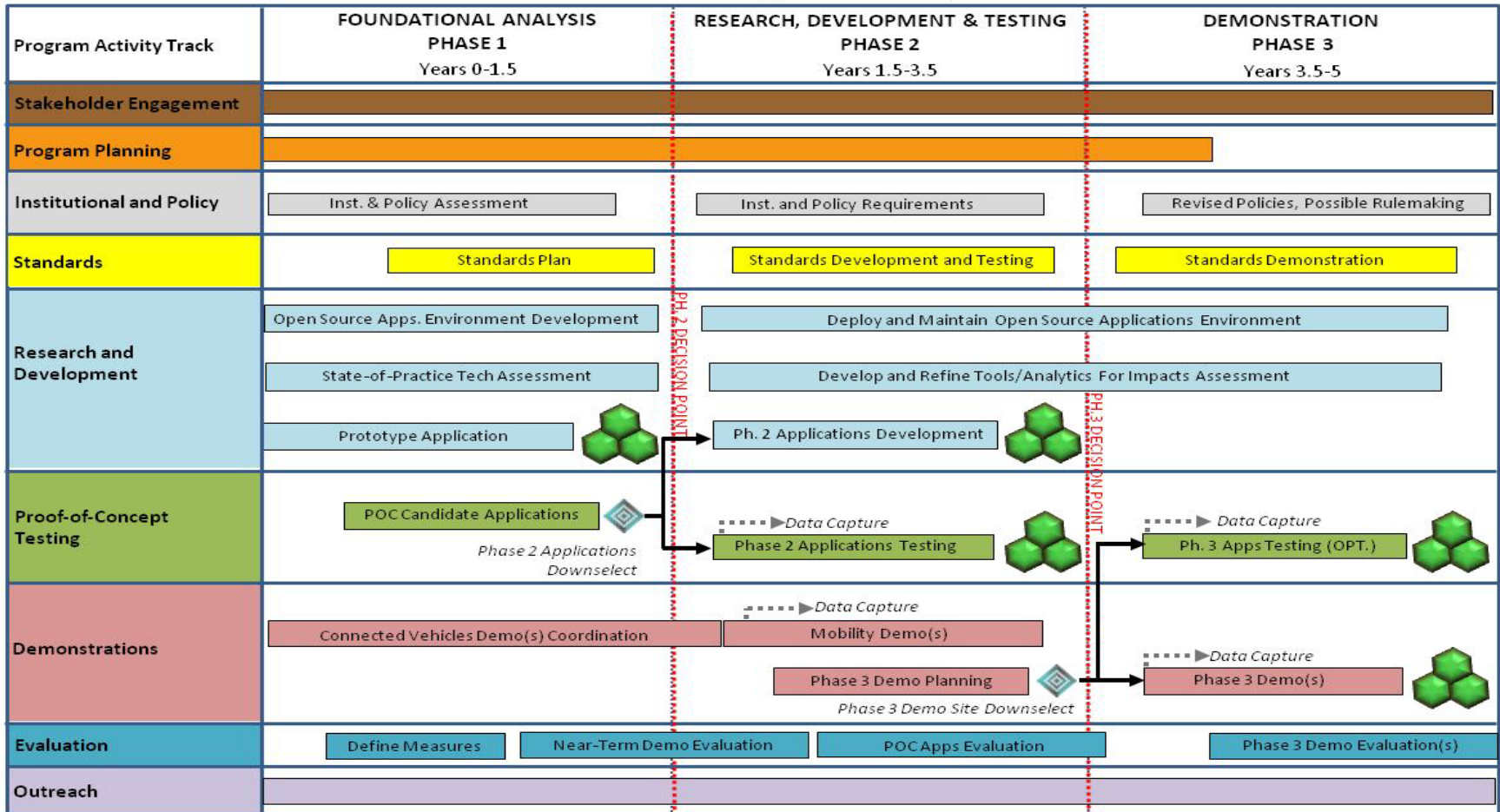- Begin concept development and needs identification in 2011

ARTERIAL DATA ENVIRONMENTS

FREEWAY DATA ENVIRONMENTS

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Q WARN
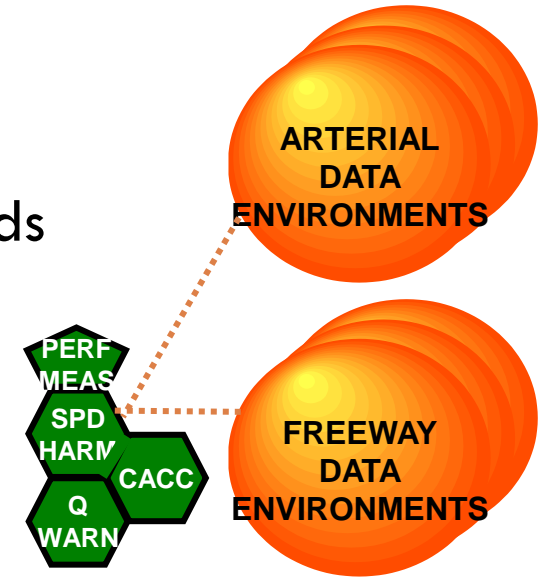
Response, Emergency Staging and Communications, Uniform Management, and Evacuation (R.E.S.C.U.M.E.)

☐ Advanced vehicle-to-vehicle safety messaging over DSRC to improve safety of emergency responders and travelers:

- ◻ Emergency Communications and Evacuation (EVAC)

- ◻ Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)

- ◻ Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)

- ◻ Mayday Relay (MAYDAY)

☐ Begin concept development and needs identification in 2011

CORRIDOR (CONTROL) DATA ENVIRONMENTS

PERF MEAS

R.E.S.C.U.M.E.

INC ZONE

RESP STG

MAY DAY

EVAC

REGIONAL (INFO) DATA ENVIRONMENTS

Dynamic Mobility Applications Roadmap

Dynamic Mobility Applications Program

Dynamic Mobility Applications Program Status and Next Steps

- High priority mobility applications identified

- Open Source Application Development Portal under development

- Develop and release in open data/open source environment a performance measurement application to prototype open source application development effort

- Begin assessing capability of analytical tools to evaluate bundle applications

- Begin concept development and needs identification for high priority bundles

Real-Time Data Capture and Management Program

Vision

- Active acquisition and systematic provision of integrated, multi-source data to enhance current operational practices and transform future surface transportation systems management

Objectives

- Enable systematic data capture from connected vehicles (automobiles, transit, trucks), mobile devices, and infrastructure

- Develop data environments that enable integration of data from multiple sources for use in transportation management and performance measurement

- Reduce costs of data management and eliminate technical and institutional barriers to the capture, management, and sharing of data

Real-Time Data Capture and Management Roadmap

Data Capture and Management Program: High-Level Roadmap
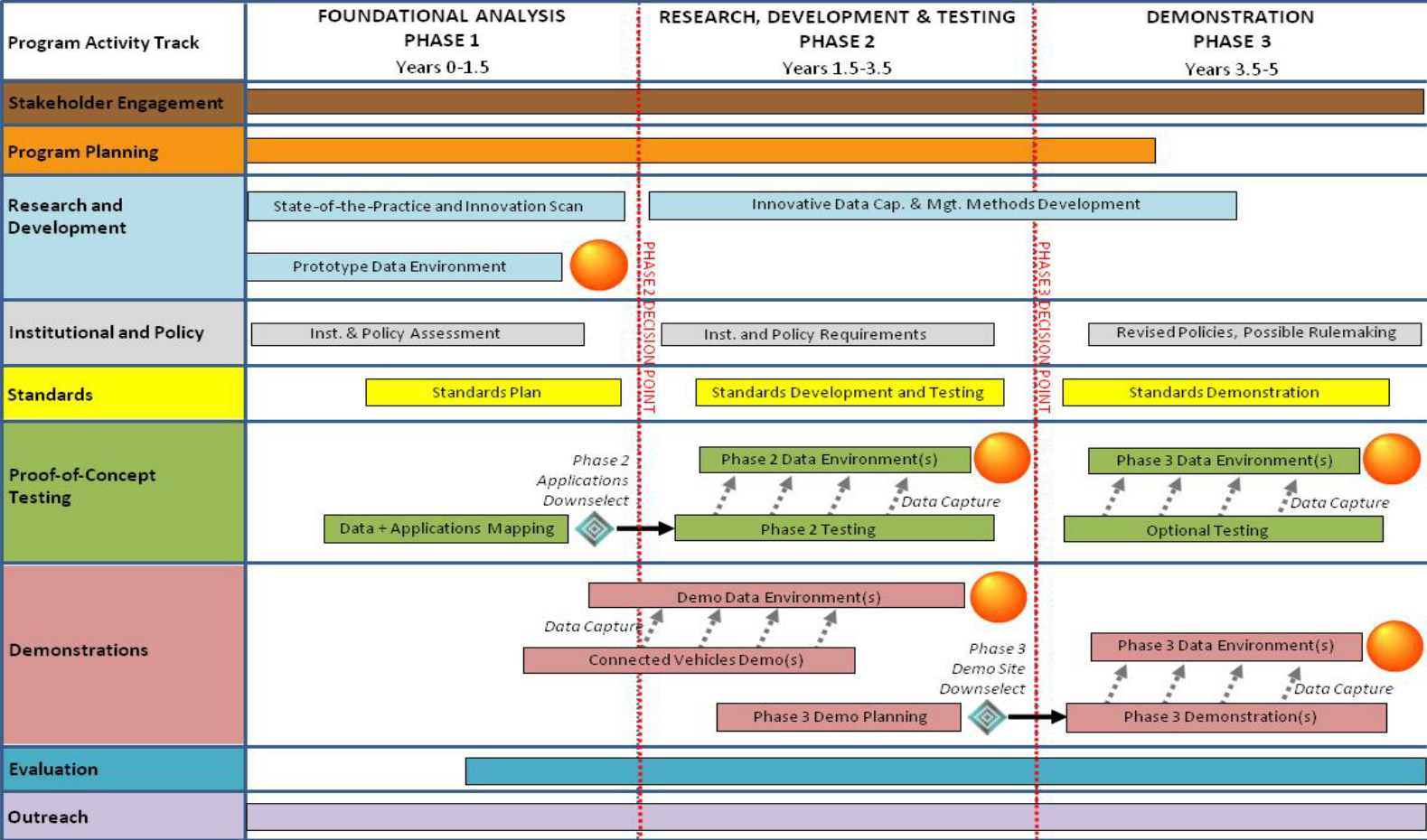
Real-Time Data Capture and Management Program Status and Next Steps

- Prototype Data Environment (https://datacapture.noblis.org/) established

- Concept of Operations for Research Data Exchange underway

- Scan of innovations in data capture and management underway

- Establish real-time data feed from Michigan Test Bed to Prototype Data Environment

- Begin releasing Test Data sets in Prototype Data Environment using open data principles