Mobility Program Update

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Mobility Program

Real-time Data Capture and Management

- Vehicle Status Data
- Infrastructure Status Data
- Weather Data
- Truck Data
- Transit Data

Dynamic Mobility Applications

- Reduce Speed 35 MPH
- Transit Signal Priority
- Weather Application
- Real-Time Travel Info
- Fleet Management/Dynamic Route Guidance
- Signal Phase & Timing Adjusts Real-Time Conditions
- Safety Alerts and Warnings

Data Environment
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

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

*JOINTLY FUNDED BY DMA AND PUBLIC SAFETY PROGRAMS
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
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
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
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
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
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
Dynamic Mobility Applications Roadmap

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### Foundations Phase 1 (Years 0-1.5)
- Stakeholder Engagement
- Program Planning
- Institutional and Policy
- Standards
- Research and Development: Open Source Apps, Environment Development, State-of-PRACTICE Tech Assessment, Prototype Application
- Proof-of-Concept Testing: POC Candidate Applications
- Demonstrations: Connected Vehicles Demo(s) Coordination
- Evaluation: Define Measures
- Outreach

### Research, Development & Testing Phase 2 (Years 1.5-3.5)
- Stakeholder Engagement
- Program Planning
- Institutional and Policy
- Standards
- Research and Development: Deploy and Maintain Open Source Applications Environment, Develop and Refine Tools/Analytics for Impacts Assessment, Ph. 2 Applications Development
- Proof-of-Concept Testing: Phase 2 Applications Testing
- Demonstrations: Mobility Demo(s)
- Evaluation: Near-Term Demo Evaluation
- Outreach

### Demonstration Phase 3 (Years 3.5-5)
- Stakeholder Engagement
- Program Planning
- Institutional and Policy
- Standards
- Research and Development: Data Capture
- Proof-of-Concept Testing: Ph. 3 Apps Testing (OPT.)
- Demonstrations: Phase 3 Demo(s)
- Evaluation: POC Apps Evaluation
- Outreach

**Legend:**
- Decision point
- Program Activity
- Data Feed
- Open Source Applications

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?
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

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### Stakeholder Engagement
- State-of-the-Art and Innovation Scan
- Prototype Data Environment

### Program Planning
- Innovations at Test Bed Sites

### Research and Development
- Inst. & Policy Requirements
- Revised Policies, Possible Rulemaking

### Institutional and Policy
- Inst. & Policy Assessment
- Inst. and Policy Requirements

### Standards
- Standards Plan
- Standards Development and Testing
- Standards Demonstration

### Proof-of-Concept Testing
- Data Applications Downselect
- Phase 2 Data Environment(s)
- Phase 3 Data Environment(s)

### Demonstrations
- Demo Data Environment(s)
- Connected Vehicles Demo(s)
- Phase 3 Demo Planning
- Phase 3 Demo Site Downselect

### Evaluation
- Evaluation

### Outreach
- Outreach

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**Legend:**
- Data Capture
- Data Feed
- Decision Point
- Data Environment
- Program Activity

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*High-Level Roadmap v1.1 (3/1/2011)*

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*Is there substantive research to be conducted in a proof-of-concept test?*
*Is the program well-defined and connected to the ITS Program?*
*Do the results from the POC tests motivate larger-scale demonstrations?*
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