

# Mobility Applications Program

## High-Priority Applications and Development Approach

In 2011, the Mobility Program will conclude a first phase of activity focused on foundational research and move into a second phase focused on applications development and testing, initiating coordinated research activities on a portfolio of ten high-priority mobility applications. As a first step, the Dynamic Mobility Applications Program will seek to partner with the research community to further develop these ten transformative concepts and to refine data and communications needs. These needs will inform related efforts in the Real-Time Data Capture and Management Program in support of application development to collect, assemble, and provide relevant data resources integrating data from wirelessly connected vehicles, travelers, and roadside/wayside infrastructure. The resulting well-organized data and associated descriptors (collectively known as data environments) will include data from field tests and advanced simulation models and be made broadly available. Later in Phase 2 of the Mobility Program, selected mobility applications will be identified for further development, testing, and benefits assessment utilizing these open data environments.

The purpose of this document is to share with stakeholders the set of high-priority applications selected by the Mobility Program for initial development in 2011. The selected applications are logically grouped around defined data environments. These collections of data resources and associated applications are designed to exploit synergies where applications have similar data needs or where coordinated, open source development across applications is critical for transformative mobility impacts.

**PRIORITIZATION INPUTS.** An open call for transformative mobility application concepts taking advantage of new forms of multi-source, multi-modal connected vehicle and traveler data was conducted between May and October 2010. This call generated 93 ideas, from which a set of 33 consolidated application concepts were derived. Consolidation was required because some concepts were similar in nature or variants of a single concept. These 33 consolidated concepts were used in exercises for participants at the Mobility and Environment Workshop (December 2010) and other interactions with stakeholders to provide input on promising applications, from which a set of stakeholder priorities were assembled. More information about the concepts is available at: <https://dma.noblis.org/>

**SELECTED APPLICATIONS.** Stakeholder and federal priorities, as well as other feedback on deployment readiness, federal role, and potential impacts were used to construct a set of four data environments and 30 associated mobility applications (Figure 1). Ten high-priority applications were selected for further development by the Mobility Program. A set of additional, related applications have been identified as opportunities for coordinated research with other federal and non-federal research programs (e.g., University Transportation Centers (UTC)).

NOTE: Each application cluster includes a tailored performance measurement activity

**ARTERIAL APPLICATIONS.** One cluster of high-priority applications relates to transformative signal control operations using enhanced data from vehicles and travelers with mobile devices. A foundational component of this data exchange utilizes Dedicated Short Range Communication (DSRC) wireless communications among enabled vehicles, mobile devices, and roadside infrastructure. Safety-related messages between mobile devices and the infrastructure will also support enhanced pedestrian signal operations (PED-SIG). Similarly, safety messages over DSRC can be combined with transit vehicle data and other data to enhance transit signal priority (TSP). An over-arching control application (ISIG) coordinates these and other signal control applications for optimized arterial operations.

**FREEWAY APPLICATIONS.** Advanced vehicle-to-vehicle safety messaging over DSRC enables new forms of speed harmonization (SPD-HARM/CACC) that integrates in-vehicle coordinated adaptive cruise control technologies. A related application will warn drivers of unexpected queues (QWARN). A second cluster of freeway applications relates to response, emergency staging and communications, uniform management, and evacuation (R.E.S.C.U.M.E).



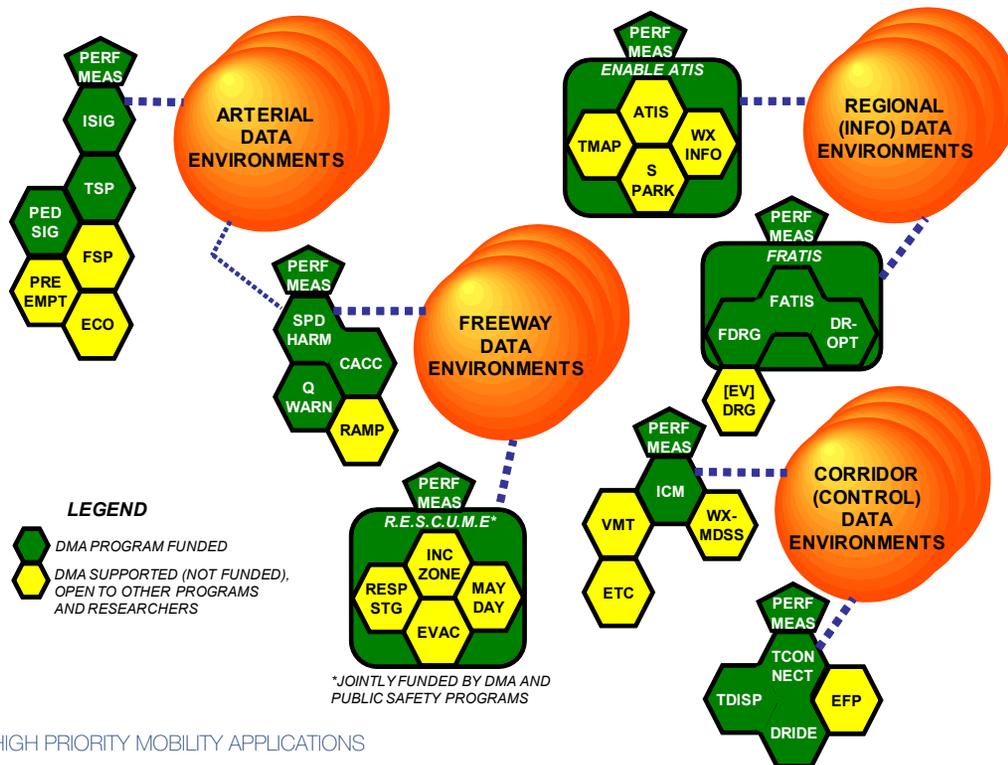


Figure 1. HIGH PRIORITY MOBILITY APPLICATIONS

**REGIONAL (INFORMATION) APPLICATIONS.** The program seeks to enable the development of new, advanced traveler information applications through the provision of integrated, multi-source, multi-modal data (Enable ATIS). Although specific ATIS applications may not be directly developed in program funded activities, this open data/open source approach is intended to engage researchers and the private sector to spur innovation. A second initiative in this area will be in the development of freight-related information applications (FRATIS), including freight-specific route guidance applications and coordinated load management to reduce empty-load trips.

**CORRIDOR (CONTROL) APPLICATIONS.** One cluster of activity in this area includes the optimization of integrated transit operations, in particular passenger connection protection (TCONNECT/TDISP/DRIDE), transit dispatching, and new forms of operational practices intended to enhance dynamic ridesharing. The second cluster involves a system-wide integration of enhanced operational practices and information services to optimize corridor mobility (ICM).

LEGEND	
ATIS	Multi-Modal Real-Time Traveler Information
CACC	Cooperative Adaptive Cruise Control
DRG	Dynamic Routing of Vehicles
D-RIDE	Dynamic Ridesharing
DR-OPT	Drayage Optimization
ECO	Connected Eco Driving
EFP	Multimodal Integrated Payment System
ETC	Electronic Toll Collection System
EVAC	Emergency Communications & Evacuation
F-ATIS	Freight Real-Time Traveler Information with Performance Monitoring
F-DRG	Freight Dynamic Route Guidance
FSP	Freight Signal Priority
ICM	NxGen Integrated Corridor Management
INC-ZONE	Incident Scene Workzone Alerts for Drivers and Workers
I-SIG	Intelligent Traffic Signal System
MAYDAY	Mayday Relay
PED-SIG	Mobile Accessible Pedestrian Signal System
PREEMPT	Emergency Vehicle Preemption with Proximity Warning
Q-WARN	Queue Warning
RAMP	NxGen Ramp Metering System
RESP-STG	Incident Scene Pre-Arrival Staging Guidance for Emergency Responders
S-PARK	Smart Park and Ride
SPD-HARM	Dynamic Speed Harmonization
T-CONNECT	Connection Protection
T-DISP	Dynamic Transit Operations
T-MAP	Universal Map Application
TSP	Transit Signal Priority
VMT	Mileage Based User Fees
WX-INFO	Real-Time Route Specific Weather Information for Motorized and Non-Motorized Modes
WX-MDSS	Enhanced MDSS Communications



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