

New Jersey ITS Architectures and Deployment Plans

Module 5 – Market Packages by ITS Functional Area



April 14 – Newark (NJTPA)
April 15 – Vineland (SJTPO)
April 23 – Trenton (NJDOT)

Module Topics

- Market Packages relevant to New Jersey

Market Packages (MPs)

- Identify pieces of National ITS Architecture required to implement a particular transportation service
 - Subsystems and Terminators
 - Equipment Packages
 - Architecture Flows

Functional Areas

- Travel and Traffic Management
- Maintenance Management
- Parking Management
- Public Transportation Management
- Inter-regional Electronic Toll/Parking/Fare Payment
- Information Archive Management
- Ports
- CVO & Ports
- Public Safety/Emergency Management/Homeland Security

Travel and Traffic Management MPs



- **Network Surveillance**

Use of detection devices in the field to collect traffic data

- **Probe Surveillance**

Use of vehicles to collect traffic data

- **Surface Street Control**

Local surface street control and/or arterial traffic management including fixed-schedule control systems to fully traffic responsive systems

- **Freeway Control**

Ramp control, lane controls, and interchange control for freeways

Travel and Traffic Management MPs (cont.)



- **HOV Lane Management**

Managing HOV lanes by coordinating freeway ramp meters and connector signals with HOV lane usage signals

- **Traffic Information Dissemination**

Provides driver information using roadway equipment such as dynamic message signs or highway advisory radio

- **Regional Traffic Control**

Sharing of traffic information and control among traffic management centers to support a regional control strategy

- **Traffic Incident Management System**

Detection and verification and implementation of an appropriate response of both unexpected incidents and planned events

Travel and Traffic Management MPs (cont.)



- **Traffic Forecast and Demand Management**

Historical evaluation, real-time assessment, and forecast of the roadway network performance using advanced algorithms, processing, and mass storage capabilities

- **Electronic Toll Collection**

Ability of toll operators to collect tolls electronically and detect and process violations

- **Emissions Monitoring and Management**

Monitoring of individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data

Travel and Traffic Management MPs (cont.)



- **Reversible Lane Management**

Managing reversible lane facilities using standard surveillance, sensory functions that detect wrong-way vehicles, and other special surveillance capabilities to mitigate safety hazards

- **Speed Monitoring**

Monitoring of vehicle speeds through equipment at the roadway

- **Virtual TMC and Smart Probe Data**

Distributing traffic management over a very wide area (e.g., a whole state or collection of states) instead of at a central TMC

Travel and Traffic Management MPs (cont.)



- **Standard Railroad Grade Crossing**

Manages highway traffic at highway-rail intersections (HRIs) including both passive (e.g., crossbuck sign) and active warning systems (e.g., flashing lights and gates)

- **Advanced Railroad Grade Crossing**

Manages highway traffic at highway-rail intersections (HRIs) including positive barrier systems

- **Railroad Operations Coordination**

Strategic coordination between freight rail operations and traffic management centers

Travel and Traffic Management MPs (cont.)



- **Drawbridge Management**

Managing drawbridges and other multimodal crossings including control devices (e.g., gates, warning lights, dynamic message signs) and information systems that are used to keep travelers appraised of current and forecasted drawbridge status

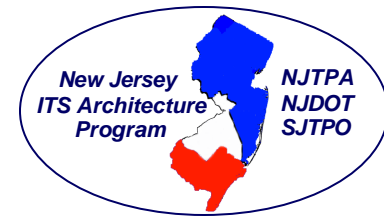
- **Roadway Closure Management**

Automatic or remotely controlled closure of roadways when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited

- **Broadcast Traveler Information**

Broadly disseminating traffic conditions, advisories, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information

Travel and Traffic Management MPs (cont.)



- **Interactive Traveler Information**

Providing tailored information in response to a traveler request

- **Autonomous Route Guidance**

Route planning and detailed route guidance based on static, stored information

- **Dynamic Route Guidance**

Advanced route planning and guidance that is responsive to current conditions

- **ISP Based Route Guidance**

Provides the user pre-trip route planning and turn-by-turn route guidance services based on either static information or real time network conditions

Travel and Traffic Management MPs (cont.)



- **Integrated Transportation Management/Route Guidance**

Provides advanced route planning and guidance responsive to current conditions, and supports collection of near-real time information on intended routes for a proportion of the vehicles

- **Yellow Pages and Reservation**

Provides yellow pages and reservation services to travelers

- **Dynamic Ridesharing**

Provide dynamic ridesharing/ride matching services to travelers

- **In Vehicle Signing**

Supports distribution of traffic and travel advisory information to drivers through in-vehicle devices

Maintenance Management MPs



- **Maintenance and Construction Vehicle and Equipment Tracking**

Tracking the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities

- **Maintenance and Construction Vehicle Maintenance**

Scheduling vehicle maintenance and managing both routine and corrective maintenance activities on vehicles and other maintenance and construction equipment

- **Road Weather Data Collection**

Collecting current road and weather conditions using data collected from environmental sensors deployed on and about the roadway

Maintenance Management MPs (cont.)



- **Weather Information Processing and Distribution**

Processing and distributing collected environmental information to detect environmental hazards such as icy road conditions, high winds, dense fog, etc.

- **Roadway Automated Treatment**

Automatically treating a roadway section based on environmental or atmospheric conditions

- **Winter Maintenance**

Winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities

Maintenance Management MPs (cont.)



- **Roadway Maintenance and Construction**

Numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way including landscape maintenance, hazard removal, and repair of field equipment

- **Work Zone Management**

Directing activity in work zones, controlling traffic through portable dynamic message signs (DMS) and informing other agencies of activity for better coordination

Maintenance Management MPs (cont.)



- **Work Zone Safety Monitoring**

Systems that improve work crew safety and reduce collisions between the motoring public and maintenance and construction vehicles such as detection of vehicle intrusions in work zones and warning crew workers and drivers of imminent encroachment

- **Maintenance and Construction Activity Coordination**

Disseminating maintenance and construction activity to centers that can utilize it as part of their operations, or to Information Service Providers who can provide information to travelers

Parking Management MPs

- **Parking Facility Management**

Enhanced monitoring and management of parking facilities

- **Regional Parking Management**

Coordination between parking facilities to enable regional parking management strategies

Public Transportation Management MPs



- **Transit Vehicle Tracking**

Monitoring of current transit vehicle location using an Automated Vehicle Location System

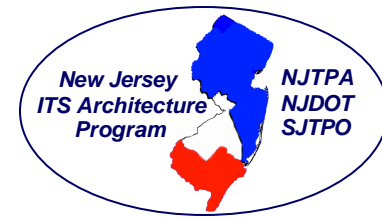
- **Transit Fixed-Route Operations**

Vehicle routing and scheduling, as well as automatic operator assignment and system monitoring for fixed-route and flexible-route transit services

- **Demand Response Transit Operations**

Vehicle routing and scheduling as well as automatic operator assignment and monitoring for demand responsive transit services

Public Transportation Management MPs (cont.)



- **Transit Passenger and Fare Management**

Use of electronic means to manage passenger loading and fare payments on-board transit vehicles

- **Transit Security**

Physical security of transit passengers and transit vehicle operators

- **Transit Maintenance**

Automatic transit maintenance scheduling and monitoring using on-board condition sensors

Public Transportation Management MPs (cont.)



- **Multi-modal Coordination**

Two way communications between multiple transit and traffic agencies to improve service coordination

- **Transit Traveler Information**

Provides transit information to transit users at transit stops and on-board transit vehicles including stop annunciation, imminent arrival signs, and real-time transit schedule displays

Information Archive Management MPs



- **ITS Data Mart**

A focused archive that houses data collected and owned by a single agency, district, or other organization

- **ITS Data Warehouse**

Archive that includes data from multiple agencies and data sources spanning across modal and jurisdictional boundaries

- **ITS Virtual Data Warehouse**

Broad access to multimodal, multidimensional data physically distributed ITS archives that are each locally managed

CVO MPs

- **Fleet Administration**

Managing a fleet of commercial vehicles including routing of vehicles

- **Freight Administration**

Tracking the movement of cargo and monitoring the cargo condition

- **Electronic Clearance**

Automated clearance at roadside check facilities

- **CV Administrative Processes**

Electronic application, processing, fee collection, issuance, and distribution of CVO credential and tax filing

CVO MPs (cont.)

- **International Border Electronic Clearance**

Automated clearance at international border crossings including customs

- **Weigh-In-Motion**

High speed weigh-in-motion with or without Automated Vehicle Identification (AVI)

- **Roadside CVO Safety**

Automated commercial vehicle safety inspections at the roadside check facilities including monitoring and reporting

CVO MPs (cont.)

- **On-board CVO and Freight Safety & Security**

On-board commercial vehicle safety monitoring and reporting

- **CVO Fleet Maintenance**

Maintaining CVO fleet vehicles with on-board monitoring equipment and Automated Vehicle Location (AVL)

- **HAZMAT Management**

Integrating incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents

CVO MPs (cont.)

- **Roadside HAZMAT Security Detection and Mitigation**

Detecting and classifying security sensitive HAZMAT on vehicles using roadside sensing and imaging technology

- **CV Driver Security Authentication**

Monitoring and detection for an unauthorized commercial vehicle driver driving a vehicle based on stored driver identity information

- **Freight Assignment Tracking**

Planning and tracking of the commercial vehicle, the freight equipment, and the commercial vehicle driver of commercial vehicle shipments. for consistency with the planned assignment

Public Safety / EM / Homeland Security MPs



- **Emergency Call-Taking and Dispatch**

Provides basic public safety call-taking and dispatch services =

- **Emergency Routing**

Supports automated vehicle location and dynamic routing of emergency vehicles

- **Mayday Support**

Request for emergency assistance and ability to locate the caller, gather information about the incident, and determine the appropriate response

Public Safety / EM / Homeland Security MPs (cont.)



- **Roadway Service Patrols**

Monitoring of roads by roadway service patrol vehicles that aid motorists, offering rapid response to minor incidents to minimize disruption to the traffic stream

- **Transportation Infrastructure Protection**

Monitoring of transportation infrastructure for potential threats using sensors and surveillance equipment and barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident

Public Safety / EM / Homeland Security MPs (cont.)



- **Wide-Area Alert**

Alert the public in emergency situations using ITS driver and traveler information systems

- **Early Warning System**

Monitoring and detecting potential, looming, and actual disasters including natural disasters and technological and man-made disasters

Public Safety / EM / Homeland Security MPs (cont.)



- **Disaster Response and Recovery**

Enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community

- **Evacuation and Reentry Management**

Supporting evacuation of the general public from a disaster area and managing subsequent reentry to the disaster area

- **Disaster Traveler Information**

Providing disaster-related traveler information to the general public