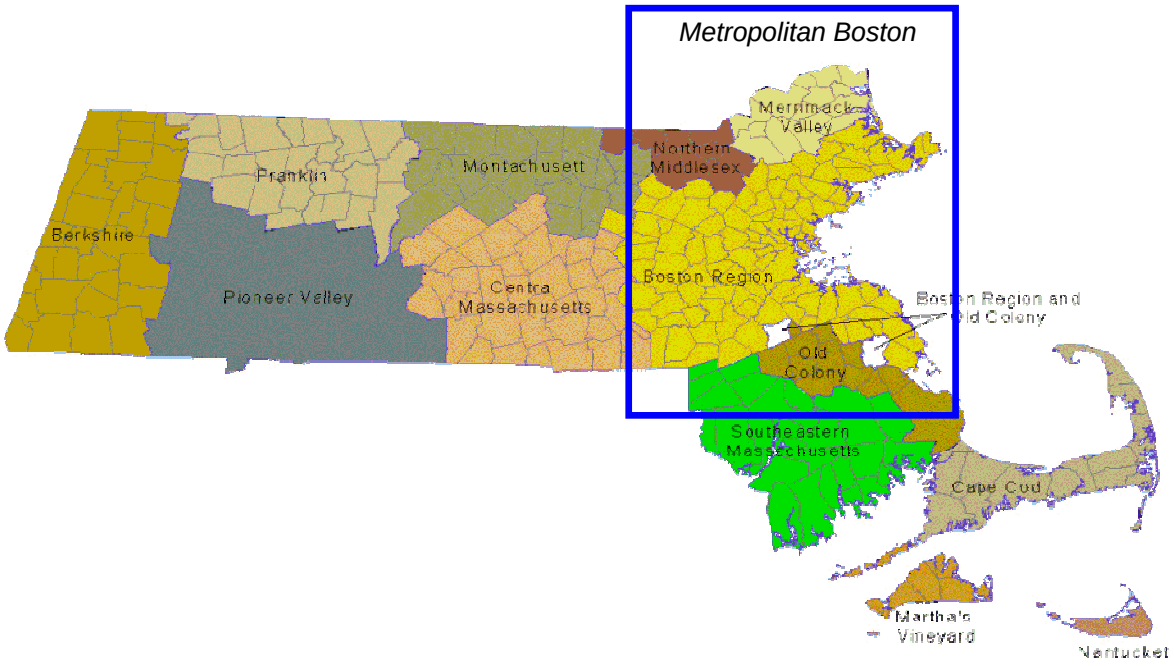
Commonwealth of Massachusetts

REGIONAL ITS ARCHITECTURE FOR METROPOLITAN BOSTON



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OPERATIONAL CONCEPT

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16. Abstract

The Commonwealth of Massachusetts, through the Executive Office of Transportation (EOT), has undertaken the development of a Regional Intelligent Transportation Systems Architecture for Metropolitan Boston. In the initial steps of the architecture development process, stakeholder interviews, workshops, and working sessions determined the technical components of the architecture. This process developed an architecture that defines the existing and planned component systems, as well as the interfaces among them. The architecture provides a vision of an integrated transportation system that involves numerous agencies. It is critical, therefore, to address the many interagency relationships needed to plan, operate, and maintain those systems. For this reason, the architecture development process includes the creation of an operational concept.

This Operational Concept focuses on the institutional aspects of the Regional ITS Architecture. It defines the relationships among the organizations in the region required for the deployment and operation of an integrated transportation system. The purpose of the operational concept is to define the roles and responsibilities of the stakeholders in the implementation and operation of the systems that make up the architecture.

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1. INTRODUCTION

Intelligent Transportation Systems (ITS) are applications of advanced technology in the field of transportation, with the goals of increasing operational efficiency and capacity, improving safety, reducing environmental costs, and enhancing personal mobility. Successful ITS deployment requires an approach to planning, implementation, and operations that emphasizes collaboration between relevant entities and compatibility of individual systems. At the core of this process is an architecture that guides the coordination and integration of individual ITS deployment projects. This ITS architecture is a framework that defines the component systems and their interconnections, and that provides a tool for facilitating institutional relationships within a region.

The Commonwealth of Massachusetts, through the Executive Office of Transportation (EOT), has undertaken the development of a Regional Intelligent Transportation Systems Architecture for Metropolitan Boston. For the purposes of this study, Metropolitan Boston was defined as the area generally within I-495, Boston's outer circumferential highway. The Office of Transportation Planning (OTP) has led a project team consisting of IBI Group in association with ConSysTec Corporation and Rizzo Associates. The consultant team also included an advisory panel consisting of James McGrail, Esq. of Nora Burke and Co., Paula Okunieff of Systems & Solutions, Inc., and Dr. Joseph Sussman of the Massachusetts Institute of Technology.

Key transportation agencies and other stakeholders in the region provided extensive input in the process, with many serving on a Guidance Committee. Their involvement included participating in meetings and workshops and reviewing project deliverables. Out of this process, with the help of these stakeholders, came an architecture that represents a vision of an integrated transportation system for the Metropolitan Boston region and the interagency relationships needed to support it.

In the initial steps of the architecture development process, stakeholder interviews, workshops, and working sessions determined the technical components of the architecture. This process developed an architecture that defines the existing and planned component systems, as well as the interfaces among them. The architecture provides a vision of an integrated transportation system that involves numerous agencies. It is critical, therefore, to address the many interagency relationships needed to plan, operate, and maintain those systems. For this reason, the architecture development process includes the creation of an operational concept.

The operational concept focuses on the institutional aspects of the Regional ITS Architecture. It defines the relationships among the organizations in the region required for the deployment and operation of an integrated transportation system. The purpose of the operational concept is to define the roles and responsibilities of the stakeholders in the implementation and operation of the systems that make up the architecture.

Section 2 of this document, *Operational Coordination*, discusses the different levels of interaction and types of information exchange that may be required for operation of interagency interfaces. Section 3, *Interagency Interfaces*, presents a detailed operational concept for each of the interagency interfaces that the architecture identifies. Finally, Section 4, *Institutional Coordination*, covers the key institutional issues, including interagency agreements.

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2. OPERATIONAL COORDINATION

ITS initiatives that involve cross-jurisdictional relationships will require a detailed operational concept. In some cases, multiple agencies will need to form relationships with each other to define specific roles and responsibilities for the deployment and operation of the system.

Operational relationships between agencies are defined by two main components: 1) the roles/responsibilities of each agency in the relationship, and 2) the types of information that each agency shares. Exhibit 2-1 identifies seven types of agency-to-agency relationships, spanning the range of potential institutional interactions that might occur between two organizations in the operation and maintenance of an ITS application. The exhibit lists the relationships from lowest to highest level of interaction and provides definitions and examples for each of the identified relationships.

Exhibit 2-1: Agency-to-Agency Relationships

Relationship	Definition	Example
Consultation	One party confers with another party, in accordance with an established process, about an anticipated action and then keeps that party informed about the actions taken. Information is exchanged through traditional means of communication, such as phone or face-to-face meetings.	Agency A provides information on activities to Agency B.
Cooperation	The parties involved in carrying out the planning, project development and operations processes work together to achieve common goals or objectives. Information is exchanged through traditional means of communication.	Both agencies cooperate in the development and execution of common plans, projects, and operational procedures.
Information Sharing	The electronic exchange of data and device status information between parties for the purposes of coordinated operations, planning, and analysis.	Agency A will provide status, data, and/or video information from Agency A's field devices (e.g. detectors) to Agency B.
Control Sharing	The ability, through operational agreements, to allow for one party to control another party's field devices to properly respond to incident, event, weather, or traffic conditions.	Agency A is allowed by Agency B to control the Agency B's field devices (e.g. VMS, select signal timing patterns) for specified defined occurrences.
Operational Responsibility Shifted	One party operates the field equipment of a second party on a full time basis.	Agency A will operate the field devices of Agency B (e.g. County operates a City's traffic signals but the City is responsible for maintenance and repairs.)
Maintenance Responsibility Shifted	One party maintains the field equipment of a second party.	Agency A maintains the field devices of Agency B, but the Agency B is responsible for operations.
Full Responsibility Shifted	One party has full responsibility for the field equipment of a second party including operations and preventative and emergency maintenance.	Agency A operates and maintains the field devices of Agency B.

Each of these relationships implies some exchange of information between two agencies. The information being exchanged can be classified into one of six types of information flows. Exhibit 2-2 provides definitions and examples for these information flows.

As these exhibits illustrate, the extent of interaction and information exchange between agencies can vary greatly. Relationships can vary from consultation and cooperation, where electronic information is not exchanged, to full transfer of operational responsibility. The extent of the interaction will depend on many factors, including the nature of the information being exchanged, the technical capabilities of the agencies, and the institutional relationships already in place. A different relationship may therefore be appropriate for each particular interagency interface. The next section discusses all of the interagency interfaces in the architecture and proposes an operational concept for each, based on the relationships and information flows identified by the participants.

Exhibit 2-2: Information Flow Definitions

Information Flow	Definition	Example
Data	The dissemination of raw, unprocessed data gathered from one party's field devices or systems to another party. Data can include, but is not limited to, traffic, weather, parking, transit data, etc. Video images are not included in this information flow.	Agency A sends data from its field devices to Agency B.
Video	The dissemination of live video and still images from one party's field camera's to another party	Agency A sends live video and still images to Agency B.
Event Information	The dissemination of event/incident information or other processed data from one party to another party.	Agency A sends processed data to Agency B.
Device Status	The ability for one party to monitor another party's field devices, and to receive such information as current signal timing/response plan, current message sets, etc.	Agency A sends status information on its devices to Agency B.
Request	The ability for one party to solicit either information or a command change, such as Variable Message Sign (VMS) or signal timing changes, from another party.	Agency A requests information or action from Agency B.
Control	The ability for one party to control another party's field devices. Control can include but is not limited to, changing VMS messages, changing traffic signal timings, camera control, etc.	Agency A issues control instruction to Agency B's field devices.

3. INTERAGENCY INTERFACES

Of the hundreds of interfaces included in the architecture, the ones considered in the Operational Concept are those that involve multiple agencies. The interagency interfaces called for in the Regional ITS Architecture are identified and defined in this section. The interfaces are addressed within the following categories:

- Roadway Management
- Transit Management
- Emergency Management
- Data Archives
- Electronic Fare Payment
- Electronic Toll Collection

It should be noted that these categories are not the same as the functional areas used in the "Market Packages by Functional Area" section of the architecture and as defined by the National ITS Architecture. Instead, these categories have been defined in order to help in the discussion of the large number of interfaces. They do not directly correspond to the market package functional areas because the interfaces of interest do not necessarily fall under a single market package or even a single functional area. For example, the interface supporting the provision of traffic information from a traffic management center to a bus control center falls under both the "Traffic Information Dissemination" and "Transit Fixed-Route Operations" market packages. The interface might also support the provision of traffic signal priority for buses, which would fall under both the "Transit Fixed-Route Operations" market package and the "Regional Traffic Control" market package.

To reduce this overlap, the following subsections group the interfaces under the more basic categories defined above. Within each category, operational concepts have been defined for either individual interfaces or groups of similar interfaces. The intent of the discussion of each interface is to outline how the interface will be addressed by the two agencies, including what information will be exchanged and how this exchange will occur. Defining these interfaces serves as the initial step in the development of agreements between the interfacing agencies, as it starts the process of identifying the content and the issues that must be addressed in the interagency agreements.

3.1 Roadway Management

Exhibit 3-1 illustrates the interagency interfaces required to support regional roadway management functions. There are numerous interfaces between the various traffic management centers in the region. An additional set of interfaces exists between each of the traffic management centers and private traveler information service providers to support traveler information functions.

Exhibit 3-1: Interagency Interfaces – Roadway Management

	BTD	City of Brockton	Local Cities and Towns	MassHighway	MassPike	Massport	MDC	Private Traveler Information Service Providers
BTD			✓	✓	✓	✓	✓	✓
City of Brockton			✓	✓				✓
Local Cities and Towns				✓	✓	✓	✓	✓
MassHighway					✓	✓	✓	✓
MassPike						✓	✓	✓
Massport								✓
MDC								

Each of these interfaces is addressed by an operational concept. The following operational concepts are defined for Roadway Management:

- Center-to-Center
  - MassHighway and MassPike
  - BTD and MassHighway
  - BTD and MassPike
  - BTD and Massport
  - Massport and MassHighway
  - Massport and MassPike
  - Other
- Traffic Signal Operation
- Private Traveler Information

Note that a separate Center-to-Center operational concept is defined between each of the major control centers in the region. This is due to the specialized nature of the major control centers in the region (i.e. those of BTD, MassHighway, MassPike, and Massport) and the need to recognize preexisting relationships established among them. These operational concepts are presented in Exhibit 3-2 through Exhibit 3-10.

Exhibit 3-2: Operational Concept: Roadway Management – Center-to-Center (MassHighway and MassPike)

Operational Concept:	**Center-to-Center (MassHighway and MassPike)**
Functional Area:	Roadway Management
The interface between MassHighway and MassPike will be implemented between their respective traffic control centers, namely the MassHighway Traffic Operations Center and the MassPike CA/T Operations Control Center. The interface will support a number of functions, including traffic management, maintenance management, and traveler information (e.g. the 511 Travel Information System).	
Interfacing Agencies:	▪ MassHighway and MassPike

Information Flow	*Relationship*
Data:	*Information Sharing:* Traffic data, including flows and speeds calculated at vehicle detector stations, will be exchanged between the two control centers. This will be achieved by a link between the traffic management systems at both facilities. An operator at the MassHighway TOC, for example, will be able to view sensor output from selected CA/T traffic detectors on his/her control console.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. For MassHighway, the central traffic management system software will automatically send event information to the database. For the MassPike, entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for its traffic management software. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Consultation:* Data exchange will be automatic and thus not require requests between agencies. Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-3: Operational Concept: Roadway Management – Center-to-Center (BTD and MassHighway)

Operational Concept:	**Center-to-Center (BTD and MassHighway)**
Functional Area:	Roadway Management
The interface between BTD and MassHighway will be implemented between their respective traffic control centers, namely the BTD Traffic Management Center and the MassHighway Traffic Operations Center. The interface will support a number of functions, including traffic management, maintenance management, and traveler information (e.g. the 511 Travel Information System). Some of the interfaces covered by this operational concept already exist, such as the interface to exchange video through the Massachusetts Interagency Video Information System (MIVIS).	
Interfacing Agencies:	▪ BTD and MassHighway

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* As part of the Massachusetts Interagency Video Information System, video images are exchanged between the two control centers, allowing operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera remains in the control of the agency owning the camera, but requests for camera repositioning can be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. For MassHighway, the central software will automatically send event information to the database. For BTD, entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for its traffic management software. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Consultation:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-4: Operational Concept: Roadway Management – Center-to-Center (BTD and MassPike)

Operational Concept:	**Center-to-Center (BTD and MassPike)**
Functional Area:	Roadway Management
The interface between BTD and MassPike will be implemented between their respective traffic control centers, namely the BTD Traffic Management Center and the MassPike CA/T Operations Control Center.	
Interfacing Agencies:	▪ BTD and MassPike

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio). Currently, some CA/T cameras are viewable at the TMC as described.
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-5: Operational Concept: Roadway Management – Center-to-Center (BTD and Massport)

Operational Concept:	**Center-to-Center (BTD and Massport)**
Functional Area:	Roadway Management
The interface between BTD and Massport will be implemented between their respective traffic control centers, namely the BTD Traffic Management Center and the Massport Landside Operations Control Center.	
Interfacing Agencies:	▪ BTD and Massport

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-6: Operational Concept: Roadway Management – Center-to-Center (Massport and MassHighway)

Operational Concept:	**Center-to-Center (Massport and MassHighway)**
Functional Area:	Roadway Management
The interface between Massport and MassHighway will be implemented between their respective traffic control centers, namely the Massport Landside Operations Control Center and the MassHighway Traffic Operations Center. The interface will support a number of functions, including traffic management, maintenance management, and traveler information (e.g. the 511 Travel Information System).	
Interfacing Agencies:	▪ Massport and MassHighway

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. For MassHighway, the central software will automatically send event information to the database. For Massport, entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for its traffic management software. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-7: Operational Concept: Roadway Management – Center-to-Center (Massport and MassPike)

Operational Concept:	**Center-to-Center (Massport and MassPike)**
Functional Area:	Roadway Management
The interface between Massport and MassPike will be implemented between their respective traffic control centers, namely the Massport Landside Operations Control Center and the MassPike CA/T Operations Control Center.	
Interfacing Agencies:	▪ Massport and MassPike

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. Similarly, event information will be received by each traffic management center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-8: Operational Concept: Roadway Management – Center-to-Center (Other)

Operational Concept:	**Center-to-Center (Other)**
Functional Area:	Roadway Management
This operational concept covers interfaces between major traffic control centers and smaller dispatch/operation centers (such as those of the MDC and some local cities/towns). The interfaces included in this operational concept will support a number of functions, including traffic management, maintenance management, and traveler information (e.g. the 511 Travel Information System).	
Interfacing Agencies:	▪ Local Cities/Towns and BTD ▪ Local Cities/Towns and MassHighway ▪ Local Cities/Towns and MassPike ▪ Local Cities/Towns and Massport ▪ City of Brockton and Local Cities/Towns ▪ City of Brockton and MassHighway ▪ MDC and Local Cities/Towns ▪ MDC and MassHighway ▪ MDC and MassPike ▪ MDC and Massport

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* If the smaller operation has capability for video, video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two centers through a shared connection to a centralized database. Each agency will enter event information into the database for roadways within its jurisdiction. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the central software (if applicable). Similarly, event information will be received by each traffic management center either through operator monitoring of a web-based interface or through an automated link with the central software.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as VMS messages, will occur via voice communications. Coordination via phone or radio will be essential when incident response on one agency's roadways will affect operations on the other agency's roadways. Automated exchange of device status information, such as the ability to monitor messages displayed on the other agency's VMSs, is recommended for future implementation.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on the other agency's VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

Exhibit 3-9: Operational Concept: Roadway Management – Traffic Signal Operation

Operational Concept:	**Traffic Signal Operation**
Functional Area:	Roadway Management
This operational concept applies to the interface between BTD and MDC. This interface is implemented between the BTD Traffic Management Center and select MDC traffic signal controllers within the City of Boston.	
Interfacing Agencies:	▪ BTD and MDC

Information Flow	*Relationship*
Data:	Not applicable.
Video:	Not applicable.
Event Information:	Not applicable.
Device Status:	Not applicable.
Request:	Not applicable.
Control:	*Operational Responsibility Shifted:* Traffic signals and signal controllers owned by MDC will be monitored and operated by BTD as part of the central traffic signal system at the Traffic Management Center. MDC will be responsible for maintenance of all field equipment, but BTD will have full operational control.

Exhibit 3-10: Operational Concept: Roadway Management – Private Traveler Information

Operational Concept:	**Private Traveler Information**
Functional Area:	Roadway Management
This operational concept applies to the interfaces between Private Traveler Information Service Providers' control centers and traffic management agency control centers.	
Interfacing Agencies:	▪ Private Traveler Information Service Providers and BTD ▪ Private Traveler Information Service Providers and City of Brockton ▪ Private Traveler Information Service Providers and Local Cities/Towns ▪ Private Traveler Information Service Providers and MassHighway ▪ Private Traveler Information Service Providers and MassPike ▪ Private Traveler Information Service Providers and Massport

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio). This interface already exists from SmartRoutes, a private traveler information service provider, to MassHighway and to BTD through the Massachusetts Interagency Video Information System (MIVIS).
Event Information:	*Information Sharing:* Event information, such as accident, delay, and construction information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information for roadways within its jurisdiction or coverage area into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the central software at each control center. Similarly, event information will be received by each control center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	*Independent:* No exchange of device status information is planned. However, automated exchange of device status information, such as VMS states, is recommended for future implementation, so that information provided by the private service provider is consistent with agency messages.
Request:	*Coordination:* Requests for CCTV camera repositioning, as mentioned above, will be made via voice communications.
Control:	*Independent:* Direct control of the other agency's field equipment will not be permitted. All control will remain with the agency that owns the equipment. Indirect control is possible via requests to the other agency, as discussed above.

3.2 Transit Management

Exhibit 3-11 illustrates the interagency interfaces required to support regional transit management functions. These interfaces include center-to-center interfaces among transit control centers, interfaces between transit control centers and traffic control centers, and interfaces with private travel information service providers.

Exhibit 3-11: Interagency Interfaces – Transit Management

	Transit Management												Traffic Management					
	Amtrak	Local City/Town Shuttle Services	Local Human Service Transit Providers	Massport	MBTA	Private Ground Transportation Providers	BAT	CATA	GATRA	LRTA	MVRTA	TMAs	BTD	Local Cities and Towns (Traffic)	MassHighway	MassPike	Massport (Traffic)	Private Traveler Information Service Providers
Amtrak					✓									✓				✓
Local City/Town Shuttle Services					✓									✓	✓			✓
Local Human Service Transit Providers					✓									✓	✓			✓
Massport (Transit)					✓								✓	✓	✓	✓		✓
MBTA						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Private Ground Transportation Providers													✓	✓	✓	✓		✓
BAT								✓	✓	✓	✓			✓	✓			✓
CATA									✓	✓	✓			✓	✓			✓
GATRA										✓	✓			✓	✓			✓
LRTA											✓			✓	✓			✓
MVRTA														✓	✓			✓
TMAs														✓	✓			✓

Each of these interfaces is addressed by one of the following operational concepts:

- Center-to-Center
- Traffic Coordination
- Traffic Coordination and Signal Priority
- Grade Crossings
- Private Traveler Information

These operational concepts are presented in Exhibit 3-12 through Exhibit 3-16, respectively.

Exhibit 3-12: Operational Concept: Transit Management – Center-to-Center

Operational Concept:	**Center-to-Center**
Functional Area:	Transit Management
This operational concept applies to the interfaces among the various transit operations control centers. The interfaces included in this operational concept will support transit management and traveler information functions.	
Interfacing Agencies:	▪ MBTA and Amtrak ▪ MBTA and City/Town Shuttle Services ▪ MBTA and Local Human Service Transit Providers ▪ MBTA and Massport (transit) ▪ MBTA and Private Ground Transportation Providers ▪ MBTA and BAT ▪ MBTA and CATA ▪ MBTA and GATRA ▪ MBTA and LRTA ▪ MBTA and MVRTA ▪ MBTA and TMAs ▪ BAT and CATA ▪ BAT and GATRA ▪ BAT and LRTA ▪ BAT and MVRTA ▪ CATA and GATRA ▪ CATA and LRTA ▪ CATA and MVRTA ▪ GATRA and LRTA ▪ GATRA and MVRTA ▪ LRTA and MVRTA

Information Flow	*Relationship*
Data:	Not applicable.
Video:	Not applicable.
Event Information:	*Information Sharing:* Event information such as service updates will be exchanged through a shared connection to a centralized database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the central software at each control center. Event information will be received by each control center either through an automated link with the central software or through operator monitoring of a web-based interface. *Consultation:* Exchange of response status information, including incident response measures such as service modifications, will occur via voice communications. Coordination via phone or radio will be essential when incident response by one agency affects operations by the other.
Device Status:	Not applicable.
Request:	*Coordination:* Requests, such as those for service modifications such as vehicle holding or rerouting, will be made via voice communications. An automated system and protocol is recommended for situations where requests are frequent.
Control:	Not applicable.

Exhibit 3-13: Operational Concept: Transit Management – Traffic Coordination

Operational Concept:	**Traffic Coordination**
Functional Area:	Transit Management
This operational concept applies to the interfaces between transit operations control centers and traffic management control centers. The interfaces included in this operational concept will support a number of functions, including traffic management, transit management, and traveler information (e.g. the 511 Travel Information System).	
Interfacing Agencies:	▪ BTD and Massport (transit) ▪ BTD and Private Ground Transportation Providers ▪ City of Brockton and BAT ▪ Local Cities/Towns (traffic) and Local City/Town Shuttle Services ▪ Local Cities/Towns (traffic) and Local Human Service Transit Providers ▪ Local Cities/Towns (traffic) and Massport (transit) ▪ Local Cities/Towns (traffic) and Private Ground Trans. ▪ Massport (traffic) and MBTA ▪ MassHighway and Local City/Town Shuttle Services ▪ MassHighway and Local Human Service Transit Providers ▪ MassHighway and Massport (transit) ▪ MassHighway and MBTA ▪ MassHighway and Private Ground Transportation Providers ▪ MassHighway and BAT ▪ MassHighway and CATA ▪ MassHighway and GATRA ▪ MassHighway and LRTA ▪ MassHighway and MVRTA ▪ MassHighway and TMAs ▪ MassPike and Massport (transit) ▪ MassPike and Private Ground Transportation Providers

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* The transit agency will have access to video feeds from select traffic cameras to support dispatching operations. Pan/tilt/zoom control of the camera will remain in the control of the traffic operations center, but requests for camera repositioning by the transit agency may be made via voice communications (e.g. phone or radio). This interface already exists between MassHighway and the MBTA through the Massachusetts Interagency Video Information System (MIVIS).
Event Information:	*Information Sharing:* Event information from the traffic operations center, such as accident, delay, and construction information, will be provided to the transit agency through a shared connection to a centralized database. The traffic operations center will enter event information for roadways within its jurisdiction into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at the control center. The transit agency will receive event information through operator monitoring of a web-based interface. *Consultation:* Exchange of response status information, including incident response measures such as street closures or service modifications, will occur via voice communications. Coordination via phone or radio will be essential when incident response by the traffic operations center affects operations by the transit agency, and vice versa.
Device Status:	Not applicable.
Request:	*Consultation:* Requests from the transit agency to the traffic operations center for CCTV camera repositioning, as discussed above, will be made via voice communications.
Control:	*Independent:* Direct control of roadway field equipment will not be permitted, as all control will remain with the traffic operations center. Indirect control by the transit agency is possible via requests to the traffic operations center, as discussed above.

Exhibit 3-14: Operational Concept: Transit Management – Traffic Coordination and Signal Priority

Operational Concept:	**Traffic Coordination and Signal Priority**
Functional Area:	Transit Management
As with the "Traffic Coordination" operational concept described in Exhibit 3-13, this operational concept applies to the interfaces between transit operations control centers and traffic management control centers. However, this operational concept also includes the provision of signal priority for transit vehicles.	
Interfacing Agencies:	▪ BTD and MBTA ▪ Local Cities/Towns (traffic) and MBTA ▪ Local Cities/Towns (traffic) and BAT ▪ Local Cities/Towns (traffic) and CATA ▪ Local Cities/Towns (traffic) and GATRA ▪ Local Cities/Towns (traffic) and LRTA ▪ Local Cities/Towns (traffic) and MVRTA ▪ Local Cities/Towns (traffic) and TMAs

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* The transit agency will have access to video feeds from select traffic cameras to support dispatching operations. Pan/tilt/zoom control of the camera will remain in the control of the traffic operations center, but requests for camera repositioning by the transit agency may be made via voice communications (e.g. phone or radio).
Event Information:	*Information Sharing:* Event information from the traffic operations center, such as accident, delay, and construction information, will be provided to the transit agency through a shared connection to a centralized database. The traffic operations center will enter event information for roadways within its jurisdiction into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. The transit agency will receive event information through operator monitoring of a web-based interface. *Consultation:* Exchange of response status information, including incident response measures such as street closures or service modifications, will occur via voice communications. Coordination via phone or radio will be essential when incident response by the traffic operations center affects operations by the transit agency, and vice versa.
Device Status:	*Information Sharing:* Relevant status information for field devices will include traffic signal status and information about transit priority calls. Field device status will be reported to the transit authority from the traffic management center by means of a direct connection between the central systems.
Request:	*Information Sharing:* Requests for traffic signal priority for buses or light rail vehicles will be made to the traffic signal system controlled by the traffic operations center. This may occur locally at the signal controller or through a request to the central system. If the request is to the central system, the traffic operations center will make the determination of whether or not to grant priority. *Consultation:* Requests from the transit agency to the traffic operations center for CCTV camera repositioning, as mentioned above, will be made via voice communications.
Control:	*Independent:* Direct control of roadway field equipment will not be permitted, as all control will remain with the traffic operations center. Indirect control by the transit agency is possible via requests to the traffic operations center, as discussed above.

Exhibit 3-15: Operational Concept: Transit Management – Grade Crossings

Operational Concept:	**Grade Crossings**
Functional Area:	Transit Management
This operational concept applies to the interfaces between rail operations control centers and traffic management control centers, specifically for coordination of activity at at-grade rail crossings.	
Interfacing Agencies:	▪ Amtrak and Local Cities/Towns ▪ Rail Operators and Local Cities/Towns ▪ Rail Operators and MassHighway

Information Flow	*Relationship*
Data:	Not applicable.
Video:	Not applicable.
Event Information:	*Information Sharing:* Event information, such as construction activity affecting a grade crossing or rail schedule information, will be exchanged between the two control centers through a shared connection to a centralized database. Each agency will enter event information into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the software at each control center. Similarly, event information will be received by each control center either through an automated link with the central software or through operator monitoring of a web-based interface.
Device Status:	Not applicable.
Request:	Not applicable.
Control:	Not applicable.

Exhibit 3-16: Operational Concept: Transit Management – Private Traveler Information

Operational Concept:	**Private Traveler Information**
Functional Area:	Transit Management
This operational concept applies to the interfaces between transit agency control centers and control centers of Private Traveler Information Service Providers (ISPs).	
Interfacing Agencies:	▪ Private Traveler ISPs and Amtrak ▪ Private Traveler ISPs and Local Cities and Towns (transit) ▪ Private Traveler ISPs and Local Human Service Transit Providers ▪ Private Traveler ISPs and Massport (transit) ▪ Private Traveler ISPs and MBTA ▪ Private Traveler ISPs and Private Ground Transportation Providers ▪ Private Traveler ISPs and BAT ▪ Private Traveler ISPs and CATA ▪ Private Traveler ISPs and GATRA ▪ Private Traveler ISPs and LRTA ▪ Private Traveler ISPs and MVRTA ▪ Private Traveler ISPs and TMAs

Information Flow	*Relationship*
Data:	Not applicable.
Video:	Not applicable.
Event Information:	*Information Sharing:* Service updates from the transit operations center will be provided to the private service provider through a shared connection to a centralized database. The transit operations center will enter event information into the database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the software at the control center. The private service provider will receive event information through operator monitoring of a web-based interface. *Information Sharing:* Exchange of response status information, including incident response measures such as service modifications, will occur through a shared connection to a centralized database or by via voice communications in urgent situations.
Device Status:	Not applicable.
Request:	Not applicable.
Control:	Not applicable.

3.3 Emergency Management

Exhibit 3-17 illustrates the interagency interfaces required to support regional emergency management functions. These interfaces include center-to-center interfaces among the emergency management centers, as well as interfaces between emergency management centers and traffic control centers.

Exhibit 3-17: Interagency Interfaces – Emergency Management

	Emergency Management					Traffic Management							Transit Management						
	BEMA	Local City/Town/County Public Safety	MBTA (police)	MEMA	State Police	BTD	City of Brockton	Local Cities and Towns	MassHighway	MassPike	Massport	MDC	BAT	CATA	GATRA	LRTA	MBTA	MVRTA	Local City/Town Shuttle Services
BEMA		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓							
Local City/Town/County Public Safety			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MBTA (police)				✓	✓	✓		✓											
MEMA					✓	✓	✓	✓	✓	✓	✓	✓							
State Police						✓	✓	✓	✓	✓	✓	✓							

Each of these interfaces is addressed by one of the following operational concepts:

- Center-to-Center
- Traffic Coordination
  - Local
  - MEMA
  - MEMA/MassHighway
  - State Police
- Transit Coordination

These operational concepts are presented in Exhibit 3-18 through Exhibit 3-23, respectively.

Exhibit 3-18: Operational Concept: Emergency Management – Center-to-Center

Operational Concept:	**Center-to-Center**
Functional Area:	Emergency Management
This operational concept applies to the interfaces among the various emergency management control centers.	
Interfacing Agencies:	▪ BEMA and Local Cities/Towns ▪ BEMA and MBTA ▪ BEMA and MEMA ▪ BEMA and State Police ▪ Local Cities/Towns and MBTA ▪ Local Cities/Towns and MEMA ▪ Local Cities/Towns and State Police ▪ MBTA (police) and MEMA ▪ MBTA (police) and State Police ▪ MEMA and State Police

Information Flow	*Relationship*
Data:	Not applicable.
Video:	No video exchange will be made between the two agencies.
Event Information:	*Cooperation:* Emergency event information, such as reports of accidents and other major incidents, will be exchanged by voice communication (phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information will be exchanged through a shared connection to a centralized database. Entering and viewing of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the control center software.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures, will occur via voice communications. Automated exchange of device status information, such as the ability for one agency to monitor information being disseminated by another, is recommended for future implementation.
Request:	*Cooperation:* All requests, such as emergency operations procedures or dissemination of information via the other agency's equipment, will be made via voice communications.
Control:	Not applicable.

Exhibit 3-19: Operational Concept: Emergency Management – Traffic Coordination (Local)

Operational Concept:	**Traffic Coordination (Local)**
Functional Area:	Emergency Management
This operational concept applies to the interfaces between local or regional emergency management control centers and traffic management centers.	
Interfacing Agencies:	▪ BEMA and BTD ▪ BEMA and Local Cities/Towns ▪ BEMA and MassHighway ▪ BEMA and MassPike ▪ BEMA and Massport ▪ BEMA and MDC ▪ MBTA and BTD ▪ MBTA and Local Cities/Towns ▪ Local City/Town/County Public Safety and Local Cities/Towns (traffic) ▪ Local City/Town/County Public Safety and City of Brockton ▪ Local City/Town/County Public Safety and MassHighway ▪ Local City/Town/County Public Safety and MassPike ▪ Local City/Town/County Public Safety and Massport ▪ Local City/Town/County Public Safety and MDC

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* The emergency operations center will have access to video feeds from select traffic cameras to support incident management operations. Pan/tilt/zoom control of the camera will remain in the control of the traffic management center, but requests for camera repositioning by the emergency operations center may be made via voice communications (e.g. phone or radio).
Event Information:	*Cooperation:* Emergency event information, such as reports of accidents and other major incidents, will be exchanged by voice communication (phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information from the traffic management center, such as traffic and construction information, will be provided to the emergency operations center through a shared connection to a centralized database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management center software. The emergency operations center will receive event information through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as road closures and detours, will occur via voice communications. Coordination via phone or radio will be essential when incident response by the emergency operations center affects operations by the traffic management center, and vice versa. Automated exchange of device status information, such as the ability for the emergency operations center to monitor event responses by the traffic management center, is recommended for future implementation.
Request:	*Cooperation:* Emergency operations center requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on VMSs controlled by the traffic management center, will also be made via voice communications.
Control:	*Independent:* Direct control of traffic field equipment will not be permitted, as all control will remain with the traffic management center. Indirect control by the emergency operations center is possible via requests to the traffic management center, as discussed above.

Exhibit 3-20: Operational Concept: Emergency Management – Traffic Coordination (MEMA)

Operational Concept:	**Traffic Coordination (MEMA)**
Functional Area:	Emergency Management
This operational concept applies to the interfaces between the MEMA control center and traffic management control centers.	
Interfacing Agencies:	▪ MEMA and BTD ▪ MEMA and City of Brockton ▪ MEMA and Local Cities/Towns ▪ MEMA and MassPike ▪ MEMA and Massport ▪ MEMA and MDC

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* MEMA will have access to video feeds from select traffic cameras to support incident management operations. Pan/tilt/zoom control of the camera will remain in the control of the traffic operations center, but requests for camera repositioning by MEMA may be made via voice communications (e.g. phone or radio).
Event Information:	*Cooperation:* Emergency event information, such as reports of accidents and other major incidents, will be exchanged by voice communication (phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information from the traffic operations center, such as traffic and construction information, will be provided to MEMA through a shared connection to a centralized database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic operations center software. MEMA will receive event information through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as road closures and detours, will occur via voice communications. Coordination via phone or radio will be essential when incident response by MEMA affects operations by the traffic operations center, and vice versa. Automated exchange of device status information, such as the ability for MEMA to monitor messages displayed on VMSs controlled by the traffic operations center, is recommended for future implementation.
Request:	*Cooperation:* MEMA requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on VMSs, will also be made via voice communications.
Control:	*Independent:* Direct control of traffic field equipment will not be permitted, as all control will remain with the traffic operations center. Indirect control by MEMA is possible via requests to the traffic operations center, as discussed above.

Exhibit 3-21: Operational Concept: Emergency Management – Traffic Coordination (MEMA and MassHighway)

Operational Concept:	**Traffic Coordination (MEMA and MassHighway)**
Functional Area:	Emergency Management
This operational concept applies to the interface between MEMA and MassHighway. This interface differs from the other "Traffic Coordination" interfaces in that direct control of MassHighway's central software and field equipment by MEMA will be possible under certain circumstances. The interface will be implemented between the MEMA Operations Center and the MassHighway Traffic Operations Center.	
Interfacing Agencies:	▪ MEMA and MassHighway

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* MEMA will have access to video feeds from select MassHighway cameras to support incident management operations. In non-critical conditions, pan/tilt/zoom control of the camera will remain in the control of MassHighway, but requests for camera repositioning by MEMA may be made via voice communications (e.g. phone or radio). *Control Sharing:* A back-up operator workstation for the MassHighway TOC will be located at the MEMA Operations Center. This workstation will have the same functionality as workstations in the TOC, allowing full control of all MassHighway field equipment. In critical circumstances, MEMA will be able to view and control MassHighway cameras via the remote TOC workstation.
Event Information:	*Cooperation:* Emergency event information, such as reports of accidents and other major incidents, will be exchanged by voice communication (phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information from MassHighway, such as traffic and construction information, will be provided to MEMA through a shared connection to a centralized database. The MassHighway central software will automatically send event information to the database. MEMA will receive event information through operator monitoring of a web-based interface.
Device Status:	*Information Sharing:* Automated exchange of MassHighway device status information will be provided through the remote TOC workstation. This will provide MEMA with the ability to monitor response measures, such as messages displayed on MassHighway VMSs.
Request:	*Cooperation:* MEMA requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, such as placement of messages on MassHighway VMSs, will also be made via voice communications.
Control:	*Control Sharing:* As mentioned above, MEMA will be able to take direct control of MassHighway field equipment under critical circumstances. The back-up TOC workstation will have the same functionality as workstations in the TOC, allowing full control of all MassHighway field equipment.

Exhibit 3-22: Operational Concept: Emergency Management – Traffic Coordination (State Police)

Operational Concept:	**Traffic Coordination (State Police)**
Functional Area:	Emergency Management
This operational concept applies to the interfaces between the State Police and the various traffic management control centers.	
Interfacing Agencies:	▪ State Police and BTD ▪ State Police and City of Brockton ▪ State Police and Local Cities/Towns ▪ State Police and MassHighway ▪ State Police and MassPike ▪ State Police and Massport ▪ State Police and MDC

Information Flow	*Relationship*
Data:	Not applicable.
Video:	*Information Sharing:* The State Police will have access to video feeds from select traffic cameras to support dispatching and event management operations. Pan/tilt/zoom control of the camera will remain in the control of the traffic operations center, but requests for camera repositioning by the State Police may be made via voice communications (e.g. phone or radio).
Event Information:	*Cooperation:* Emergency event information, such as reports of accidents and other major incidents, will be exchanged by voice communication (phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information from the traffic operations center, such as traffic and construction information, will be provided to the State Police through a shared connection to a centralized database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic operations center software. The State Police will receive event information through operator monitoring of a web-based interface.
Device Status:	*Consultation:* Exchange of device status information, including incident response measures such as road closures and detours, will occur via voice communications. Coordination via phone or radio will be essential when incident response by the State Police affects operations by the traffic operations center, and vice versa. Automated exchange of device status information, such as the ability for the State Police to monitor messages displayed on VMSs controlled by the traffic operations center, is recommended for future implementation.
Request:	*Cooperation:* State Police requests for CCTV camera repositioning, as mentioned above, will be made via voice communications. All other requests, including the use of VMSs for displaying emergency messages (such as Amber Alert messages), will also be made via voice communications.
Control:	*Independent:* Direct control by the State Police of roadway field equipment will not be permitted, as all control will remain with the traffic operations center. Indirect control by the State Police is possible via requests to the traffic operations center, as discussed above.

Exhibit 3-23: Operational Concept: Emergency Management – Transit Coordination

Operational Concept:	**Transit Coordination**
Functional Area:	Emergency Management
This operational concept applies to the interfaces between local or regional emergency management control centers and transit management centers.	
Interfacing Agencies:	▪ Local City/Town/County Public Safety and BAT ▪ Local City/Town/County Public Safety and CATA ▪ Local City/Town/County Public Safety and GATRA ▪ Local City/Town/County Public Safety and LRTA ▪ Local City/Town/County Public Safety and MBTA ▪ Local City/Town/County Public Safety and MVRTA ▪ Local City/Town/County Public Safety and Local City/Town Shuttle Services

Information Flow	*Relationship*
Data:	Not applicable.
Video:	Not applicable.
Event Information:	*Cooperation:* Emergency event information, such as reports of major incidents or incident response measures such as service modifications, will be exchanged by voice communication (e.g. phone or radio). The critical nature of such communication requires this direct person-to-person interface. *Information Sharing:* Non-emergency event information from the transit management center, such as service updates, will be provided to the emergency operations center through a shared connection to a centralized database. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the central software at the transit management center. The emergency operations center will receive event information through operator monitoring of a web-based interface.
Device Status:	Not applicable.
Request:	*Coordination:* Requests, such as those for service modifications such as vehicle holding or rerouting, will be made via voice communications. An automated system and protocol is recommended for situations where requests are frequent.
Control:	Not applicable.

3.4 Data Archives

Exhibit 3-24 illustrates the interagency interfaces required to support regional data archive management functions. These include interfaces with the Office of Transportation Planning (proposed as the hub of an integrated data archive system), as well as an interface between the RMV and state/local police for crash reporting.

Exhibit 3-24: Interagency Interfaces – Data Archives

	BTD	CTPS	EOT (OTP)	MassHighway	MassPike	Massport	MBTA	MAPC	MVPC	NMCOG	OCPC	SRPEDD	RMV	State Police	Local Public Safety
BTD			✓												
CTPS			✓												
EOT (OTP)				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
MassHighway															
MassPike															
Massport															
MBTA															
MAPC															
MVPC															
NMCOG															
OCPC															
SRPEDD															
RMV														✓	✓

Each of these interfaces is addressed by one of the following operational concepts:

- Planning Archives
- Crash Data System

These operational concepts are presented in Exhibit 3-25 and Exhibit 3-26, respectively.

Exhibit 3-25: Operational Concept: Data Archives –Planning Archives

Operational Concept:	**Planning Archives**
Functional Area:	Data Archives
This operational concept addresses the interfaces between the Office of Transportation Planning (OTP) and other agencies holding data archives. As envisioned by the architecture, OTP will serve as the regional archived data management system hub, holding information managed by OTP as well as providing a portal to the information held by other agencies.	
Interfacing Agencies:	▪ OTP and BTD ▪ OTP and CTPS ▪ OTP and MassHighway ▪ OTP and MassPike ▪ OTP and Massport ▪ OTP and MBTA ▪ OTP and RMV ▪ OTP and MAPC ▪ OTP and MVPC ▪ OTP and NMCOG ▪ OTP and OCPC ▪ OTP and SRPEDD

Information Flow	*Relationship*
Data:	*Information Sharing:* As the regional archived data management system hub, the Office of Transportation Planning archive will hold key data collected and reported by other agencies. However, data exchange will also be possible between OTP and each of the other agencies' archives, allowing OTP to serve as a portal to other data held by other agencies. This will provide OTP with access to data held by the other agencies, and will provide the other agencies with access to data held by OTP. Moreover, this will also provide participating agencies with access to each others' data, allowing one RPA, for example, to access data held by an adjacent RPA through the system maintained by OTP. This data exchange will occur over a link between the databases at each location. Access to data on the other systems will be initiated by the agency requesting the information.
Video:	Not applicable.
Event Information:	Not applicable.
Device Status:	Not applicable.
Request:	*Information Sharing:* As noted above, data exchange will occur between the databases following a request by the initiating agency.
Control:	Not applicable.

Exhibit 3-26: Operational Concept: Data Archives – Crash Data System

Operational Concept:	**Crash Data System**
Functional Area:	Data Archives
This operational concept applies to the interface between the RMV and state/local police, which supports the exchange of information between police systems and the RMV Crash Data System.	
Interfacing Agencies:	▪ RMV and State Police ▪ RMV and Local Public Safety

Information Flow	*Relationship*
Data:	*Information Sharing:* Data exchange will occur over a link between the police and the RMV database. This interface will allow submission of records to the RMV database by state or local police.
Video:	Not applicable.
Event Information:	Not applicable.
Device Status:	Not applicable.
Request:	*Information Sharing:* Data exchange will occur between the databases following a request by the initiating agency.
Control:	Not applicable.

3.5 Electronic Fare Payment

Exhibit 3-27 illustrates the interagency interfaces required to support regional implementation of electronic fare payment. The plan for EFP in the region is based on a Regional Fare Card that will be interoperable among the various transit agencies. It is envisioned that this regional fare card will be interoperable with the fare card that is currently being introduced by the MBTA. However, for the purposes of the architecture, the regional fare card will be considered as a separate entity managed by a generic "Regional Fare Card agency."

Exhibit 3-27: Interagency Interfaces – Electronic Fare Payment

	Local Cities and Towns	MBTA	Private Ground Transportation Providers	BAT	CATA	GATRA	LRTA	MVRTA	TMAs	Regional Fare Card Agency
Local Cities and Towns										✓
MBTA										✓
Private Ground Transportation Providers										✓
BAT										✓
CATA										✓
GATRA										✓
LRTA										✓
MVRTA										✓
TMAs										✓
Regional Fare Card Agency										

The interfaces to support electronic fare payment are addressed by a single operational concept, as presented in Exhibit 3-28.

Exhibit 3-28: Operational Concept: Electronic Fare Payment

Operational Concept:	**Electronic Fare Payment**
Functional Area:	Electronic Fare Payment
This operational concept applies to the interagency interfaces required to support regional implementation of electronic fare payment.	
Interfacing Agencies:	▪ Regional Fare Card Agency and Local City/Town Shuttle Services ▪ Regional Fare Card Agency and MBTA ▪ Regional Fare Card Agency and Private Ground Transportation Providers ▪ Regional Fare Card Agency and BAT ▪ Regional Fare Card Agency and CATA ▪ Regional Fare Card Agency and GATRA ▪ Regional Fare Card Agency and LRTA ▪ Regional Fare Card Agency and MVRTA ▪ Regional Fare Card Agency and TMAs

Information Flow	*Relationship*
Data:	*Information Sharing:* The Regional Fare Card Agency will hold all administrative and financial data related to the fare cards. In order for the fare card to be used on services by the transit providers in the region, data exchange is required between the fare collection systems of the transit providers and the Regional Fare Card Agency. Two primary data exchanges are required. The first data exchange occurs when the fare card is used on a transit provider's fare-box. At that time, the fare card information is sent to the Regional Fare Card Agency for validation, ensuring that the balance on the card is adequate and deducting the fare from the balance. The second data exchange occurs when the transit provider's account is reconciled with the Regional Fare Card Agency. This is usually done periodically, e.g. at the end of each service day. At that time, the total value of the transit provider's fares paid by fare cards is transferred from the Regional Fare Card Agency to the transit provider.
Video:	Not applicable.
Event Information:	Not applicable.
Device Status:	Not applicable.
Request:	*Information Sharing:* The data exchange occurring during the validation of the fare card will be performed following a request of the transit provider. This request will be initiated upon the use of the fare card in the transit provider's farebox.
Control:	Not applicable.

3.6 Electronic Toll Collection

Exhibit 3-29 illustrates the interagency interfaces required to support regional implementation of Electronic Toll Collection (ETC). As the MassPike is the ETC system provider for the region, these consist of the interfaces between the Massachusetts Turnpike Authority's Account Processing Center (APC) and other agencies accepting the toll transponders. These agencies include other toll agencies outside of the region (e.g. E-ZPass Inter-Agency Group members) as well as parking facility operators.

Exhibit 3-29: Interagency Interfaces – Electronic Toll Collection

	Tolls			Parking								
	Massport (Tobin Bridge)	MassPike	Other Toll Agencies	BTD	Local Cities and Towns	MBTA	Massport (Logan)	BAT	CATA	GATRA	LRTA	MVRTA
Massport (Tobin Bridge)		✓										
MassPike			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Toll Agencies												

These interfaces are addressed by a single operational concept, as presented in Exhibit 3-30.

Exhibit 3-30: Operational Concept: Electronic Toll Collection

Operational Concept:	**Electronic Toll Collection**
Functional Area:	Electronic Toll Collection
As the MassPike is the ETC system provider for the region, this operational concept applies to the interfaces between the Massachusetts Turnpike Authority's Account Processing Center (APC) and other agencies accepting the toll transponders, including parking facility operators.	
Interfacing Agencies:	▪ MassPike and Massport (Tobin) ▪ MassPike and Other Toll Agencies ▪ MassPike and BTD ▪ MassPike and Local Cities/Towns ▪ MassPike and MBTA ▪ MassPike and Massport (Logan) ▪ MassPike and BAT ▪ MassPike and CATA ▪ MassPike and GATRA ▪ MassPike and LRTA ▪ MassPike and MVRTA

Information Flow	*Relationship*
Data:	*Information Sharing:* As the lead agency in the implementation of ETC, the MassPike will hold all administrative and financial data related to the toll transponders. In order for the toll transponders to be used at non-Turnpike facilities in the region, data exchange is required between the toll collection system of the other operator and the MassPike. Two primary data exchanges are required. The first data exchange occurs when the transponder is used at the other operator's toll facility. At that time, the other operator's toll system sends the transaction information to the MassPike, which deducts the appropriate amount from the customer's account. The second data exchange occurs when the other toll operator's account is reconciled with the MassPike. At that time, the total value of the ETC transactions at the other toll facility is transferred from the MassPike to the other operator.
Video:	Not applicable.
Event Information:	Not applicable.
Device Status:	Not applicable.
Request:	*Information Sharing:* The data exchange occurring during the toll transaction will be performed following a request of the other operator's toll system. This request will be initiated upon the reading of a MassPike toll transponder by the other agency's toll system.
Control:	Not applicable.

4. INSTITUTIONAL COORDINATION

The Regional ITS Architecture provides both a technical and institutional framework for the deployment of ITS in the Metropolitan Boston region. This involves coordination between various agencies and jurisdictions to achieve seamless operations and/or interoperability. The existing and recommended operational concepts defined in the previous section provide guidance for the functional requirements of inter-jurisdictional interactions. These inter-jurisdictional operational concepts in turn point directly to the types of agreements that may be required between individual agencies in order to define the agency roles and responsibilities for each of these interactions. This section discusses considerations for developing inter-jurisdictional agreements for implementing the operational concepts, achieving the information flows, and operating the systems defined in the regional architecture.

4.1 Existing Agreements

Interagency coordination already occurs among the operating agencies in the Metropolitan Boston region. In some cases, the responsibilities of the coordinating agencies are detailed in interagency agreements or Memoranda of Understanding (MOUs), which provide formal documentation of agency roles, procedures, and responsibilities. In many cases, however, such as where jurisdictions meet or overlap, coordination occurs without formal agreements. In these cases, protocols may have been developed at the operating level, and the cooperating agencies rely on informal arrangements.

This section documents information regarding formal and informal interagency agreements relevant to the Regional ITS Architecture. This information was obtained from the initial architecture input meetings and subsequent contact with stakeholders. Exhibit 4-1 summarizes the operational agreements identified by the stakeholders in the region. Each of the agreements is discussed in the following subsections.

Exhibit 4-1: Existing Operational Agreements

Function	*Participants*	*Agreement*	*Status*
Traffic Management	MassHighway, MassPike	Control center co-location	Formalized (April 2000)
	BTD, MassPike	CA/T video sharing	Not formalized
	BTD, MassHighway, MBTA	Video and information sharing	Formalized (2004)
	BTD, MDC	MDC traffic signal operation (Boston)	Not formalized
	BTD, Massport	Massport traffic signal operation (S. Boston)	Under discussion
Incident Management	MassHighway, MassPike, State Police, et al.	Unified Response Manual for Roadway Traffic Incidents	Formalized (December 1998), Update under development
	MassHighway, State Police	Accident Response/Quick Clearance Agreement	Formalized (August 2003)
	MassHighway, MassPike, Massport, et al.	CA/T Incident Management & Communication Agreement	Formalized (December 1995), Updated 2001
	MassHighway, Massport	Mutual aid (Tobin Bridge incidents)	Not formalized
Multimodal Coordination	BTD, MBTA	Transit signal priority	Not formalized
Traveler Information	MassHighway, SmarTraveler	Traveler information services	Formalized (MassHighway contract)
	MBTA, SmarTraveler	Traveler information services	Formalized (MBTA contract)
	Massport, SmarTraveler	Travel time data from Logan Express vehicles	Not formalized
Electronic Toll Collection	MassPike, Massport, IAG	E-ZPass toll coalition	Formalized (coalition members)
	MassPike, Massport	Tobin Bridge electronic toll collection	Formalized
	MassPike, MBTA	ETC parking facility payment	Formalized
Emergency Management	BEMA et al.	Boston emergency management plans	Formalized
	MEMA, State Police, et al.	Massachusetts Amber Alert Plan	Formalized (October 2002)
	MassHighway, State Police	Expansion of Amber Alert Plan (highway VMSs)	Under development

4.1.1 TRAFFIC MANAGEMENT

Agreements regarding traffic management fall into two primary categories: control center coordination and traffic signal control. Agreements regarding control center coordination are the following:

- An agreement between MassHighway and the Massachusetts Turnpike for co-location of MassHighway's Regional Traffic Operations Center (RTOC) at the CA/T Operations Control Center in South Boston. A formal agreement was signed in April 2000.

- Access to Central Artery/Tunnel (CA/T) project CCTV images at the BTD Traffic Management Center. Camera control remains with the CA/T. No formal agreement has been established.

- BTD, MassHighway, and the MBTA have signed an agreement to share information among the BTD Traffic Management Center, the MBTA's Operations Control Center, and MassHighway's RTOC. This agreement includes video sharing, established through the Massachusetts Interagency Video Information System (MIVIS), as well as data sharing and communications network expansion.

For traffic signal operations, no formal agreements are in place. However, existing coordination is described below:

- Out of approximately 124 signalized intersections on MDC roadways within the city of Boston, 20 are linked with BTD's central system and are operated from its TMC. No formal agreement has been established.

- BTD is in discussion with Massport regarding the potential operations of Massport traffic signals in South Boston by BTD. This same issue will need to be addressed for the traffic signals along the CA/T corridor.

4.1.2 INCIDENT MANAGEMENT

The following formal agreements have been established for incident management:

- The *Unified Response Manual (URM) for Roadway Traffic Incidents* establishes a statewide traffic management plan for roadway incidents. The scope of the manual is limited to incidents on designated National Highway System (NHS) roadways and other principal arterials. The URM was developed by the Massachusetts Operations Action Group, consisting of representatives from the following agencies:

  - Massachusetts Highway Department
  - Massachusetts Turnpike Authority
  - Massachusetts Department of Public Health
  - Federal Highway Administration
  - Massachusetts State Police
  - Fire Chiefs' Association of Massachusetts
  - Massachusetts Department of Environmental Protection
  - Statewide Towing Association

  The original agreement was approved and signed in December 1998, but is currently being updated.

- An "Accident Response / Quick Clearance Agreement" between MassHighway and the State Police, originally signed in April 1993, is included in the 1998 URM as an annex. This agreement has since been updated, a revised version having been signed in August 2003.

- As part of the CA/T project, an Incident Management and Communication Agreement was developed by and among the following agencies:

  - Massachusetts Highway Department
  - Massachusetts Turnpike Authority
  - Massachusetts Port Authority
  - Massachusetts State Police
  - Boston Fire Department
  - Boston Emergency Medical Services
  - Boston Police Department
  - Boston Transportation Department

  An initial agreement was developed and approved for the opening of the Ted Williams Tunnel in December 1995. The document was revised in 2001 in anticipation of opening additional portions of the project, but this revised draft has not been formally approved.

Informal mutual-aid agreements also exist between agencies for incident response. For example, Massport and MassHighway coordinate response to incidents on the Tobin Bridge and its approaches without formal written agreements.

4.1.3 MULTIMODAL COORDINATION

Agreements for multimodal coordination in the region relate to traffic signal priority for MBTA transit vehicles. BTD is working with the MBTA on transit signal priority on Washington Street as part of the Silver Line project. Signal priority is also provided to Green Line vehicles on Commonwealth Avenue. However, no formal agreements have been established for this coordination.

4.1.4 TRAVELER INFORMATION

SmarTraveler, a private traveler information service provider, is under contract with MassHighway and the MBTA to provide traveler information services to those agencies. SmarTraveler also has an agreement with Massport to obtain travel time information from Logan Express buses acting as probe vehicles. This agreement is not formalized, however. SmarTraveler also has access to MDC radio frequencies as a source of incident information.

4.1.5 ELECTRONIC TOLL COLLECTION

The Massachusetts Turnpike Authority operates the "Fast Lane" electronic toll collection (ETC) system for use at its toll plazas across the state. The Turnpike Authority is a member of the Inter-Agency Group (IAG), a coalition of toll agencies in the Northeast U.S. operating the E-ZPass ETC system, with which the Fast Lane system is interoperable.

Massport, which operates the Tobin Bridge toll plaza, is also a member of the IAG. However, Massport does not issue toll transponders and instead relies on the Turnpike Authority to issue transponders and administer accounts. The Turnpike Authority's Account Processing Center (APC) handles these functions and manages the transfer of Tobin Bridge toll charges to Massport. An MOU between Massport and the Turnpike Authority formalizes this relationship.

Fast Lane transponders are also accepted for payment at the Route 128 MBTA/Amtrak parking garage in Westwood. Massport is also planning support for Fast Lane payment in its new parking management and revenue control system for its garages at Logan Airport.

4.1.6 EMERGENCY MANAGEMENT

The Boston Emergency Management Agency (BEMA), in association with other emergency management agencies in the region, has developed of a number of emergency management plans that establish procedures for coordination during emergencies. These include the following:

- Boston Emergency Response Plan
- Boston Comprehensive Emergency Management Plan
- Boston's Emergency Liaisons Response Plan
- Boston's Interoperability Communications Plan
- Boston's Critical Incident Exodus Evacuation Plan
- Boston's Emergency Shelters
- Boston's Local Emergency Planning Committee Title III Facilities
- Boston's Corporate Community Access Plan for Business Continuity
- Boston's Threat Conditions Matrix Response Plan
- Boston's Threat and Vulnerability Analysis
- Critical Public Safety Infrastructure Earthquake Analysis and HAZUS (Loss Estimation Software)
- Boston's Consequences Assessment Tool Set (CATS) and Hazard Prediction and Assessment Capability (HPAC) (Plume Modeling Capability)

4.1.7 AMBER ALERTS

The Massachusetts Amber Alert Plan documents the criteria and procedures for issuing public alerts about abducted children and their kidnappers. The initial implementation of the plan in October 2002 was an agreement by and among the Massachusetts Chiefs of Police Association, the Massachusetts State Police, the Massachusetts Emergency Management Agency (MEMA), and local broadcasters for the broadcast of child abduction alert messages via radio, cable and television stations statewide.

Extension of the plan to include posting of messages on highway variable message signs is under development. MassHighway is leading a project to review and establish policies and procedures for managing Amber Alert notifications. Participants in this project include MassHighway, MassPike, Massport, SmartRoutes, MEMA, and the State Police.

4.2 Elements of an Agreement

Agreements are established to clearly define responsibilities among the involved parties. The level of formality generally increases as risks escalate and when financial transactions take place. Formality will also increase when the performance or lack of performance on the part of one agency impacts the operations of another. For example, if an agency maintains and operates the traffic signals of another agency, clear definition of responsibilities for both parties will help ensure smooth operations.

Exhibit 4-2 presents a list of elements to consider in the development of an agreement for ITS operations and maintenance. Not all elements are relevant to each exchange of information. The level of specificity will depend on the nature of the interface.

Exhibit 4-2: Elements of an Agreement

- Operational Concept (a layperson's introduction to the nature and purpose of the agreement)
- Benefits of the agreement (e.g. operational, economic)
- Duties of Responsible Agencies (a summary of duties and responsibilities)
- Data Sharing (aspects of sharing data to be considered)
  - Provision of Data
  - Data Rights
  - Data Reuse
  - Data Identification
  - Data Availability
  - Data Accuracy
- Control Sharing (aspects of sharing control to be considered with rights and priorities being clearly understood)
  - Provision of Control
  - Control Rights
  - Control Restrictions
  - Control Priority
  - Control Availability
- Connections (defines how the connection is made)
  - Provision of Equipment
  - Physical Access Point
  - Demarcation Point / Boundary
  - Security
  - Configuration Management
  - Standards and Protocols
- System Documentation
- Operations
  - Contacts
  - Hours of Operations
  - Responsibilities
- Maintenance
  - Contacts
  - Hours of Operations
  - Responsibilities
  - Response Time
- Liability
  - Indemnity
  - Damage to Equipment
- Ownership
  - Equipment
  - Software
  - Intellectual Property
- Coordination
  - Notification
  - Periodic Reporting
  - Pre-Change Coordination
- Dispute Resolution
- Termination of Agreement
- Compensation

4.3 Recommended Agreements

In general, all interagency interfaces identified in this architecture should be covered by formal agreements. This includes interfaces under development or proposed in the architecture that have not yet been implemented, as well as interfaces that are currently operational but without a formal agreement.

4.3.1 FORMALIZATION OF EXISTING WORKING ARRANGEMENTS

Although some existing informal agreements may be operating without apparent problems, there are a number of considerations that point to the need for adoption of a formal agreement:

- *Rationale for agreement:* A formal agreement that explains the reasoning behind the agreement and that lays out the benefits of the cooperation will help justify the arrangement to the participating parties, other agencies that would benefit from coordination, and to the public. This will help build and maintain support for continuing a beneficial relationship, especially when the agreement may be reconsidered in the future.

- *Documentation of procedures:* By documenting existing procedures that are operating successfully, a formal agreement can help maintain an interface in the face of personnel or administrative change. An informal agreement that relies solely on interpersonal relationships at the operating level may quickly dissolve if operating staff changes occur.

- *Institutional commitment:* Adopting a formal agreement shows commitment by the participating agencies to continue the relationship. While an informal agreement shows commitment at the operating level, a formal agreement shows commitment at the institutional level. Support for a relationship at the administrative levels of the participating agencies will be essential for continued operation of the interface.

- *Address liability issues:* In a cooperative arrangement, situations may arise where one or both parties may be held liable for damage or injuries sustained as a result of human or technical error. A formal agreement that documents agency roles and responsibilities with consideration for liability concerns will speed the process of conflict resolution and reduce resulting legal costs.

For the reasons outlined above, it is therefore recommended that existing working arrangements be considered for formalization. Especially important are those working arrangements that involve technical coordination and cost considerations, as well as arrangements involving public safety. Therefore, the following existing arrangements are recommended for formalization:

- BTD and MassPike: CA/T video sharing
- BTD and MDC: MDC traffic signal operation
- BTD and MBTA: Transit signal priority
- MassHighway and Massport: Mutual aid for Tobin Bridge incidents

4.3.2 AGREEMENTS FOR NEW INTERFACES

Agreements should also be developed for the new interfaces proposed in the Regional ITS Architecture. All of the interagency interfaces in the architecture are identified and categorized in Section 3. As with the existing informal agreements, all interfaces should have formal agreements.

However, the key interfaces to consider initially are those involving technical coordination and those involving emergency management, as shown in Exhibit 4-3.

Exhibit 4-3: Recommended Agreements for New Interfaces

Functional Area	*Interface Type*
Roadway Management	Center-to-Center
Transit Management	Center-to-Center
	Traffic Coordination
Emergency Management	Center-to-Center
	Traffic Coordination
Data Archives	Planning Archives
Electronic Fare Payment	Regional Fare Card
Electronic Toll Collection	Parking Facility Payment

4.3.3 SAMPLE INTERAGENCY AGREEMENTS

To illustrate the components of an interagency agreement, the Appendix presents two sample interagency agreements:

- The first is an example of an agreement between an RTA and a municipality. This agreement corresponds to the "Transit Management – Traffic Coordination and Signal Priority" operational concept that was shown in Exhibit 3-14.

- The second is an example of an agreement between a traffic management agency and an emergency management or public safety agency. This agreement corresponds to the "Emergency Management – Traffic Coordination" operational concept that was shown in Exhibit 3-19.

As recommended, the agreements document the rationale for the agreement as well as the operational procedures that govern the relevant interfaces.

APPENDIX

SAMPLE INTERAGENCY AGREEMENTS

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AGREEMENT

This AGREEMENT, dated the __ day of, _____, is entered into by and between the _____ Regional Transit Authority ("_RTA") a body politic and corporate and public instrumentality of the Commonwealth, organized and existing under Chapter 161B of the Massachusetts General Laws, as amended and the _____ ("___") an agency of the City of _____, a municipal corporation of the Commonwealth of Massachusetts, as amended.

RECITALS

WHEREAS, Chapter 161B, Section 2, of the Massachusetts General Laws ("Chapter 161B") authorizes the _RTA to enter into all contracts and agreements and to do all acts and things necessary, convenient or desirable in the performance of its duties and the execution of its powers under Chapter ____; and

WHEREAS, _RTA operates the _RTA Operations Control Center and the ___ operates the ___ Traffic Management Center in order to, among other things, facilitate intermodal traffic flow, enhance passenger and motorist safety, improve the efficiency of incident management resources and enhance incident response for the _RTA and the city of _____; and

WHEREAS, the parties desire to improve their efforts to facilitate intermodal traffic flow, enhance passenger and motorist safety, improve the efficiency of incident management resources and enhance incident response for the _RTA and the city of _____; and

WHEREAS, the parties desire to set forth in this Agreement the terms and conditions of the interface between the transit operations center and the city traffic management centers described herein.

NOW, THEREFORE, THE _RTA AND ___ agree as follows:

1. The term of this Agreement will be for (xx) years, subject to renewal by mutual agreement.

2. _RTA will have access to video feed from select traffic cameras, identified in "Exhibit A" and attached hereto and made part of this agreement, to support dispatching operations.

3. Pan/tilt/zoom control of the camera will remain in the control of the ___ traffic operations center, but requests for camera repositioning by the _RTA may be made via voice communications (e.g. phone or radio).

4. Video will be transmitted by means of a Video Integration System, which will transmit video over a secure Internet connection.

5. Event information form the ___ traffic operations center, such as accident, delay, and construction information, will be provided to the _RTA via the Internet-based Event Reporting System (ERS).

6. The ___ traffic operations center will enter event information for roadways within its jurisdiction into the ERS. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. The _RTA will receive event information through operator monitoring of the ERS interface.

7. Exchange of device status information, including incident response measures such as street closures or service modifications, will occur via voice communications.

8. Coordination via voice or radio will be essential when incident response by the ___ traffic operations center affects operations by the _RTA, and vice versa.

9. Relevant status information for field devices will include traffic signal status and information about transit priority calls.

10. Field device status will be reported to the _RTA from the ___ traffic management center by means of a direct connection between the central systems.

11. Requests for traffic signal priority for buses or light rail vehicles will be made to the traffic signal system controlled by the ___ traffic operations center.

12. Direct control of roadway field equipment will not be permitted, as all control will remain with the ___ traffic operations center.

13. Indirect control by the _RTA is possible via a voice communications (e.g. phone or radio) request to the ___ traffic operations center.

14. _RTA and ___ agree that there will be no transfer of rights under this Agreement to any party without the written consent of both the _RTA and ___.

Whenever notice to one party by the other party is necessary or appropriate under this Agreement, such notice will be in writing and will be sent by first class mail, overnight delivery, hand delivery or facsimile to the following persons, unless otherwise directed by a formal notice:

_RTA: Executive Director
_____ Regional Transit Authority

Copy to: General Counsel
_____ Regional Transit Authority

"City":

Copy to: City Solicitor

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be duly exercised as a sealed instrument as of the date first written above.

_____ REGIONAL TRANSIT AUTHORITY

_____

Approved as to Form:

_____
General Counsel

CITY OF _____

_____

Approved as to Form:

_____
City Solicitor

AGREEMENT

This AGREEMENT, dated the __ day of, _____, is entered into by and between the _____and the _____.

RECITALS

WHEREAS,; and

WHEREAS,; and

WHEREAS, the parties desire to improve their efforts to facilitate traffic flow, enhance motorist safety, improve the efficiency of incident management resources and enhance incident response for _____through the interface of _____ emergency management control centers and _____traffic management centers; and

WHEREAS, the parties desire to set forth in this Agreement the terms and conditions of their duties for the traffic coordination between the _____ emergency management control centers and the _____traffic management centers described herein.

NOW, THEREFORE, THE ___ AND ____ agree as follows:

1. The term of this Agreement will be for (xx) years, subject to renewal by mutual agreement.

2. Video images will be exchanged between the two control centers to allow operator viewing of select CCTV cameras from the other agency.

3. ___ and ___ will agree on the exchange of video by means of a Video Integration System, which will transmit video over a secure Internet connection.

4. Pan/tilt/zoom control of the camera will remain in the control of the agency owning the camera, but requests for camera repositioning may be made via voice communications (e.g. phone or radio).

5. All costs related to the establishment and maintenance of the Video Integration System will be divided equally by the parties.

6. ___ and ___ will develop Standard Operating Procedures (SOPs) for operation of the Video Integration System.

7. Event information form the ___ traffic operations center, such as accident, delay, and construction information, will be provided to the ____ via the Internet-based Event Reporting System (ERS).

8. The ___ traffic operations center will enter event information for roadways within its jurisdiction into the ERS. Entering of information may be manual, by means of a web-based interface, or automatic, by means of an automated process developed for the traffic management software at each control center. The ____ will receive event information through operator monitoring of the ERS interface.

9. Exchange of device status information, including incident response measures such as street closures or service modifications, will occur via voice communications.

10. Coordination via voice or radio will be essential when incident response by the ___ traffic operations center affects operations by the ____, and vice versa.

11. Direct control of roadway field equipment will not be permitted, as all control will remain with the ___ traffic operations center.

12. Indirect control by the ____ is possible via a voice communications (e.g. phone or radio) request to the ____ traffic operations center.

13. ___ and ___ agree that there will be no transfer of rights under this Agreement to any party without the written consent of both the ___ and ___.

Whenever notice to one party by the other party is necessary or appropriate under this Agreement, such notice will be in writing and will be sent by first class mail, overnight delivery, hand delivery or facsimile to the following persons, unless otherwise directed by a formal notice:

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be duly exercised as a sealed instrument as of the date first written above.

_____ _____

Approved as to Form: Approved as to Form:

_____ _____