4 The Role of Regional ITS Architecture in Project Programming

4.1 Introduction

This chapter presents an approach for integrating regional ITS architecture into the transportation planning and project programming process. The approach leverages the regional ITS architecture as a roadmap to project sequencing and interdependency to achieve an integrated transportation system. This chapter will explore how to use the regional ITS architecture to support transportation planning, and to mainstream ITS into the traditional decision-making of planners and other transportation professionals.

4.2 Regional ITS Architecture and the Transportation Planning Process

The goal of the transportation planning process is to make informed decisions pertaining to the efficient investment of public funds on regional transportation systems and services. Similarly, the objective of the regional ITS architecture is to support the effective and efficient deployment of intelligent transportation systems (ITS) projects that address those transportation needs of the region. The regional ITS architecture focuses on the *integration* of systems to gain the maximum benefit of each system's information and capabilities across the transportation network.

A regional ITS architecture provides a short-term and long-term, multi-modal vision of how ITS and ITS projects can be deployed in the region to satisfy the goals and objectives outlined in the Long Range Transportation Plan. The regional ITS architecture provides the details on how ITS can be deployed to provide the transportation services and satisfy the strategies identified for the region. These details may include the interfaces, data exchanges, operational concepts and agreements necessary to implement the strategies and transportation services. With these details, ITS projects can be more clearly defined, funded, and implemented to satisfy the regional goals.

The regional ITS architecture also includes a complete inventory of the current and proposed ITS systems across all modes in the region (or state). The architecture not only indicates the transportation services and functions already provided by existing deployments, but also highlights areas where these systems may be deficient.

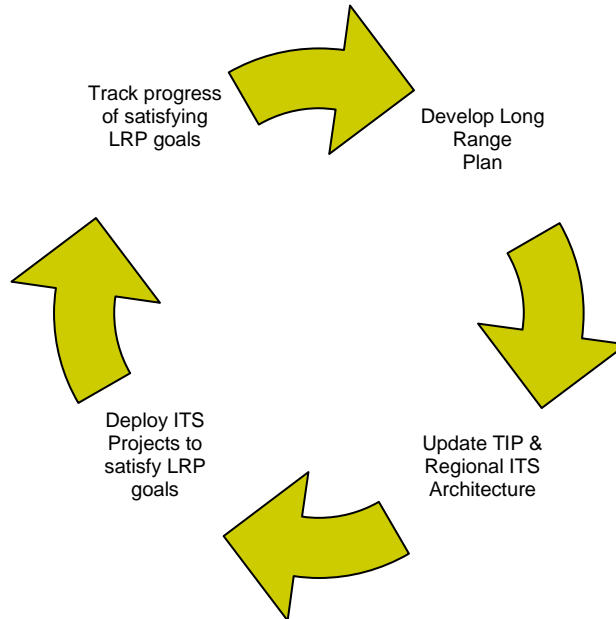The regional ITS architecture can be used to support transportation planning on two different levels:

- Long Range Transportation Plan (LRP), and

- Transportation Improvement Plan (TIP)

In the State of New York, the Long Range Transportation Plan and Transportation Improvement Plan are generally developed under the auspices of a region's Metropolitan Planning

Organization (MPO). Both these plans are fed by numerous transportation planning activities at the regional and local level.

However, like the overall transportation planning process, the relationship between the regional ITS architecture and the development of the LRP is an iterative process illustrated in the figure below.

Figure 4-1. Regional Transportation Planning Process

As ITS projects are implemented, their deployment status should be updated in the regional ITS architecture. Indication of the progress in deploying transportation services supported by ITS provides valuable feedback for TIP and LRP updates.

4.3 The Long Range Transportation Plan

The Long Range Transportation Plan (LRP) is one of the principal products of the transportation planning process for each Metropolitan Planning Organization. It is the representation of a region's long-term approach to constructing, operating, and maintaining the transportation systems in its region. It is also the forum for balancing transportation investments among modes, geographic areas, and institutions.

The LRP documents the goals and objects for the region over a 20-year (or longer) period. Federal requirements dictate that the LRP be updated minimally every three years and that an LRP be maintained for each region as part of the process for long-range transportation planning. Federal regulations also specify several requirements on what information must be included in the LRP. These requirements include:

- Present both long-range and short-range strategies/actions leading to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods.

- Assess capital investment and other measures necessary to preserve existing transportation systems and make the most efficient use of existing transportation facilities to relieve vehicular congestion and enhance the mobility of people and goods.

- Include design concepts and scope descriptions of all existing and proposed transportation facilities in sufficient detail in non-attainment and maintenance areas to permit conformity determinations.

- Include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue.

4.3.1   Example Regional ITS Architecture Contribution to the Long Range Transportation Plan

One of the goals defined in the Long Range Transportation Plan (LRP) of many MPOs is to improve regional mobility and accessibility. Specifically, the ease of movement through the transportation system by users, with the appropriate access to desired destinations and alternative transportation modes. Improving the integrated multi-modal transportation system (which includes efficient and safe travel for travelers, seamless and overlapping service, and a few other objectives) were also goals of the TIP.

In the regional ITS architecture, several transportation services were identified that will contribute to meeting these regional objectives. They include ATMS06 – Traffic Information Dissemination, and ATMS07 – Regional Traffic Control.

Table 4-1. Example Regional ITS Architecture Transportation Services

Market Package	Description	Services Provided
ATMS06	Traffic Information Dissemination	This market package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Information Service Providers. A link to the Maintenance and Construction Management subsystem allows real time information on road/bridge closures due to maintenance and construction activities to be disseminated.
ATMS07	Regional Traffic Control	This market package provides for the sharing of traffic information and control among traffic management centers to support a regional control strategy. This market package advances the Surface Street Control and Freeway Control Market Packages by adding the communications links and integrated control strategies that enable integrated interjurisdictional traffic control. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Surface Street Control and Freeway Control Market Packages and adds hardware, software, and fixed-point to fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of control between traffic management centers.

A regional ITS architecture market package diagram for each transportation service identified is provided in the following figures.

Figure 4-2. Example Customized Market Package ATMS06 – Traffic Information Dissemination
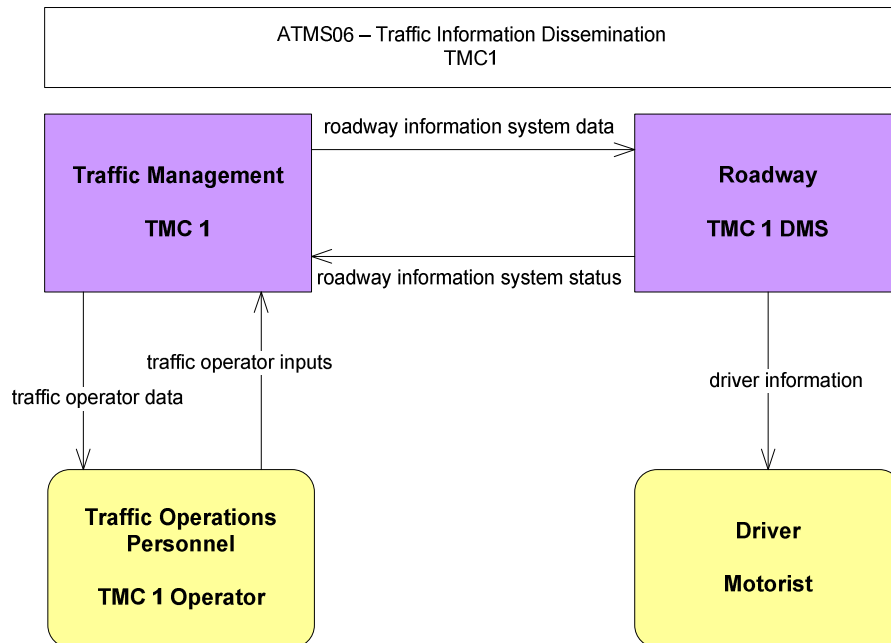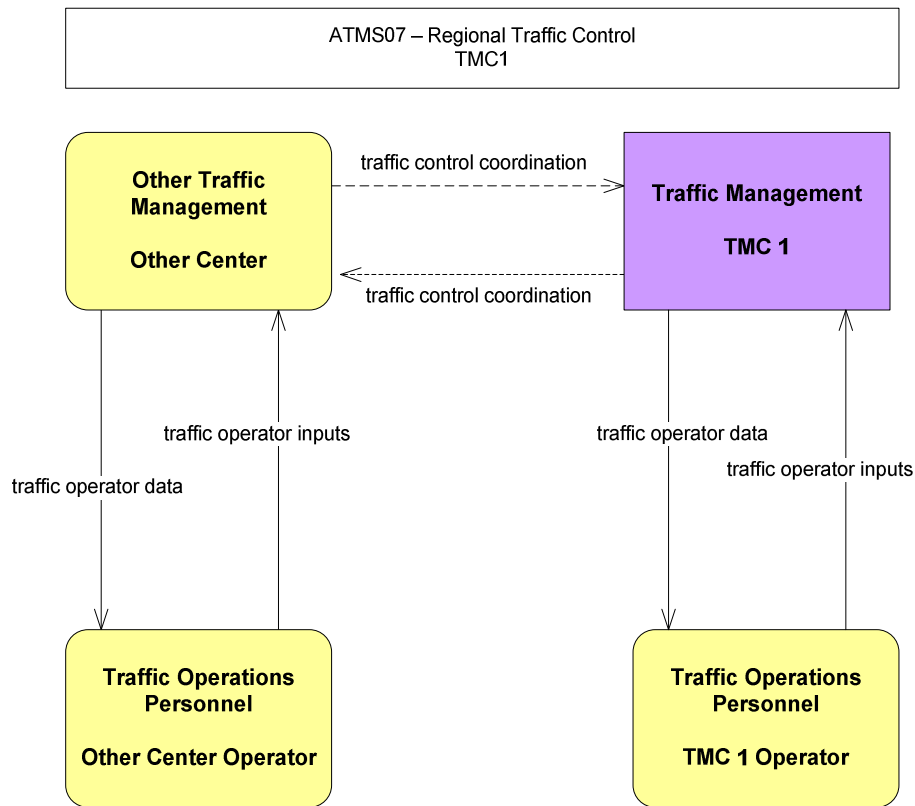
Figure 4-3. Example Regional ITS Architecture Customized Market Package ATMS07 – Regional Traffic Control

4.4   The Transportation Improvement Program (TIP)

The Transportation Improvement Program (TIP) is a staged, multiyear, intermodal program of transportation improvements for a region, which is consistent with the region's Long Range Transportation Plan (LRP). For some MPOs, the TIP is also the capital program, normally over a 5-year period, which implements the goals and objectives identified in the region's Long Range Transportation Plan, and is fiscally constrained within the reasonable cost estimates anticipated for those years. The TIP is a representation of how the region plans to attain the goals and objectives described in the LRP. The adoption of the TIP serves an additional purpose in that it assures the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) that the transportation agency members that comprise the MPO have agreed on priorities for the region.

By federal mandate, the TIP must be periodically prepared by each metropolitan region and by each state requesting federal funding for transportation projects. The TIP describes specific transportation improvements that will be deployed and/or operated in the region for at least the next three years. The U.S. Department of Transportation does not approve use of Federal funds for a transportation improvement project unless the project is identified in the TIP.

Inclusion of ITS projects on the TIP does not guarantee Federal funding, but it does make that funding possible. For some MPOs, projects not funded by the Federal government are also included on the TIP to provide a more comprehensive picture of the proposed allocation of transportation funds in the region.

Federal regulations also specify several requirements on what information must be included in the TIP. These requirements include:

- Be updated at least biennially

- Be a product of the metropolitan planning process

- Identify transportation improvements consistent with concepts proposed in the LRP along with recommendations for Federal funding during the program period

- Include highway, transit and other intermodal projects

- Be fiscally constrained

- Create opportunities for public participation and comment

- Indicate the transportation priorities of the region

- Include realistic estimates of total costs that fiscal year

It is recommended that the TIP Process for each MPO be updated so that the criteria for identifying ITS projects for the TIP include whether the ITS project is represented in its regional ITS architecture. The criteria may also be expanded to also consider if the ITS project is considered a short-term or long-term priority in the regional ITS architecture.

This might be accomplished by adding a check box on the IPP to indicate whether the project includes ITS elements.

4.4.1 Role of the Regional ITS Architecture in defining the TIP

The regional ITS architecture development process not only defines ITS projects, but also establishes a preferred sequencing of these projects, which can form a part of the overall project prioritization effort required to complete a TIP. All projects that go into the TIP are also subject to some form of prioritization. Transportation planning factors that may impact priority include cost-benefit, technical feasibility, institutional issues, financial constraints and the strategic priorities of the region. Some of the factors that are considered in developing these priorities include:

- Urgency of need for the project

- Project effectiveness versus cost

- Sequencing as related to other ITS and non-ITS projects (e.g. Is it best if ITS implementation is done at the same time as a construction project?).

Example project definitions from the New York City Sub-Regional ITS Architecture (Region 11) are shown below.

Table 4-2. Example Regional ITS Architecture Project Definitions

Lead Agency	Package Name	Project Description	Dependencies
NYSDOT	New York Statewide IEN – NYSDOT	This package provides the interfaces from the Joint TMC to the New York State Department of Transportation Statewide Information Exchange Network (IEN). This interface enables the sharing of traffic information, including field equipment status, and traffic images between traffic management centers in New York State. This package includes the hardware and software to enable these functions.	N/A
NYSDOT	Expansion of IIMS – NYSDOT	This package is the expansion of Integrated Incident Management System communications network to other transportation and emergency management agencies that do not already have interfaces to the network. This package includes the hardware and field equipment to support the expansion, and enhancing software to support new functions and interfaces, as necessary.	N/A

Projects, when derived from the regional ITS architecture, do not have to be a separate, standalone projects in the traditional sense, that is, with a specific scope of work for a specific agency or agencies, and a defined budget. Rather, these projects can be characterized as packages, a set of scopes of work with a collection of requirements, interfaces and flows that provide specific transportation services. These packages can be combined with other non-ITS projects, such as highway repaving jobs, or other ITS scopes of works, to form projects for the TIP.

Project descriptions for the TIP are usually more extensive than those associated with the Long Range Transportation Plan. Project descriptions typically include:

- Sufficient descriptive material to identify the project or phase, including type of work, expected length of project

- Identification of the agencies responsible for carrying out the project