

Appendix C

New York State ITS Standards Specification Development Guide

Example New York State ITS Project Concept of Operations

Prepared for

New York State Department of Transportation

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Revision History

Filename	Version	Date	Author	Comment
NYStateSpecGuide_ApC – ConOps.doc	0.3	11/22/06	M. Insignares	Initial Draft

1 Introduction

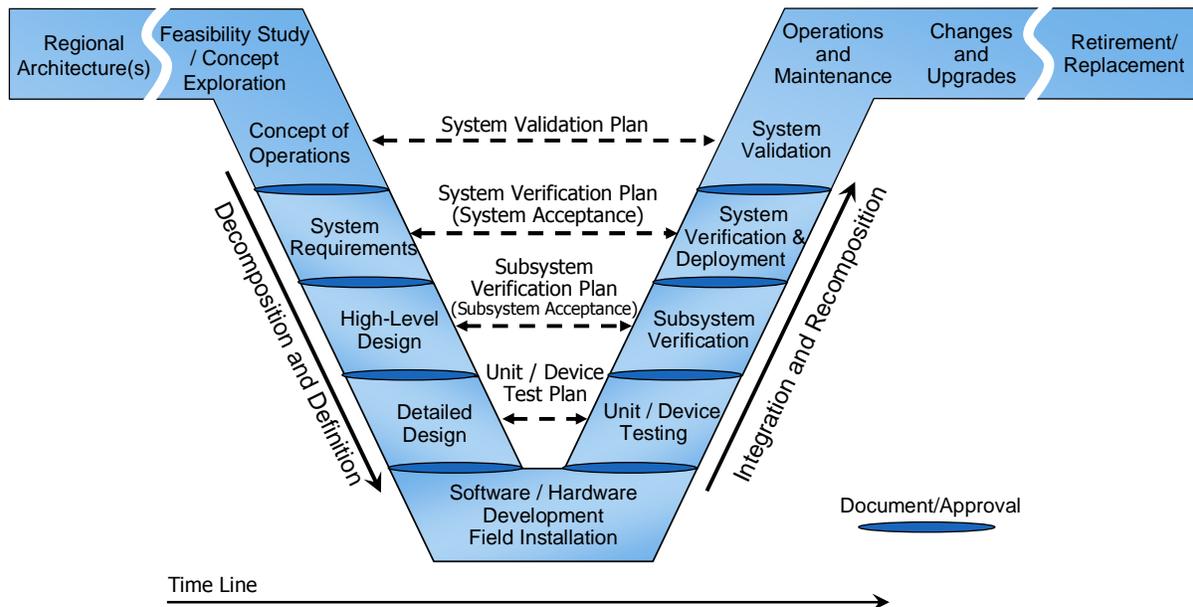
1.1 Project Background

The New York State Department of Transportation (NYSDOT) has initiated a project to deploy an end-to-end communications system to improve transportation information dissemination to motorists and neighboring agencies. This deployment will result in the expansion of the NYSDOT ITS program, and work towards the deployment of transportation operations communications network.

This (Draft) NY State Concept of Operations Report has been developed through the consensus input of regional stakeholders.

1.2 Specification Development Approach

Following a Systems Engineering Methodology, a user-needs assessment and concept of operations (ConOps) are defined in this report. The figure below shows the Concept of Operations in relation to the Systems Engineering 'VEE' model to ITS project development.



The system functional requirements for the project will form the basis for development of the technical specifications for information exchange among centers in the region.

1.3 Document Organization

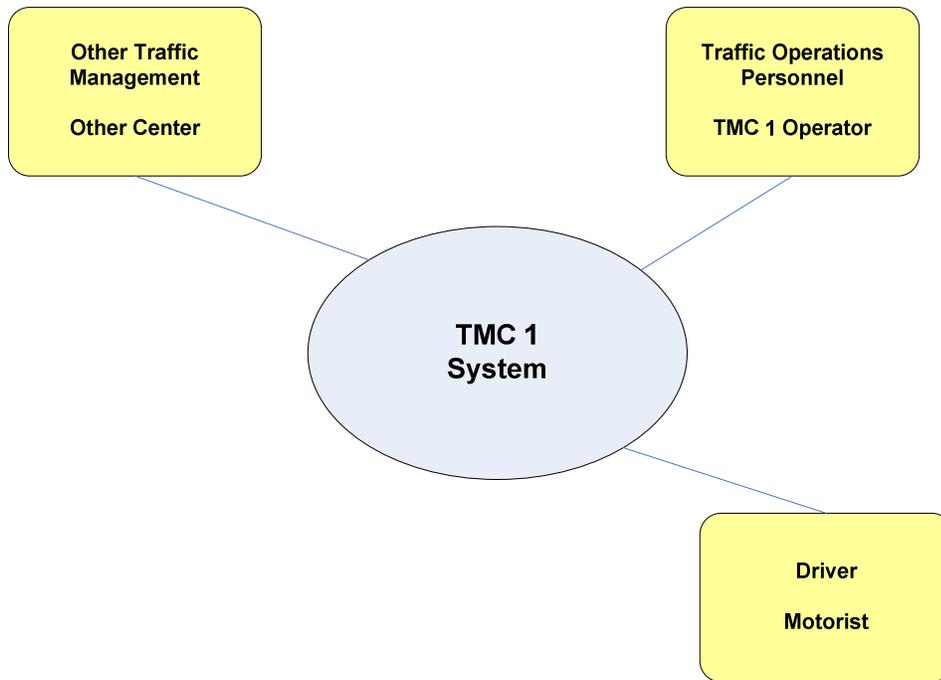
This document is comprised of five Sections and three Appendices.

- Section 1 - Introduction. This section provides an overview of the document and introductory material.
- Section 2 – System Overview. Provides an overview of the system users vis-à-vis the TMC 1 System.
- Section 3 – System Users and User Needs Assessment. Provides a description of User Classes, Users, User Roles and Responsibilities, and User Needs.
- Section 4 – Operational Scenarios. Provides scenario for workflow steps necessary to attain the users needs.

2 System Overview

The system overview shows the system from the users perspective. The System Overview below was derived from the User Needs Workshop, analysis of the portions of the regional ITS architecture that will be implemented (review of the customized market packages).

Figure 2-1. TMC 1 System Overview.



3 System Users and User Needs

The primary source of user needs defined in this ConOps was the User Needs Workshop held on XX/YY/ZZ, planned early in the development effort. The focus of the User Needs Workshop was to gather needs (and associated requirements/ design inputs) from project stakeholders.

This ConOps has been developed with participation from the various stakeholders and users of the ITS System.

3.1 Identification of Users, User Needs, and Roles and Responsibilities

3.1.1 Identification of User Classes and Users

The ConOps includes who the users are, and who is affected by the system. This may includes the operations department (operates the system), maintenance department (maintains the system), and public safety agencies (makes requests). The regional ITS architecture provides

an excellent source of information on potential system users. Applicable customized market packages that pertain to the project are shown below.

Figure 3-1. Example Regional ITS Architecture Customized Market Package Used in ConOps

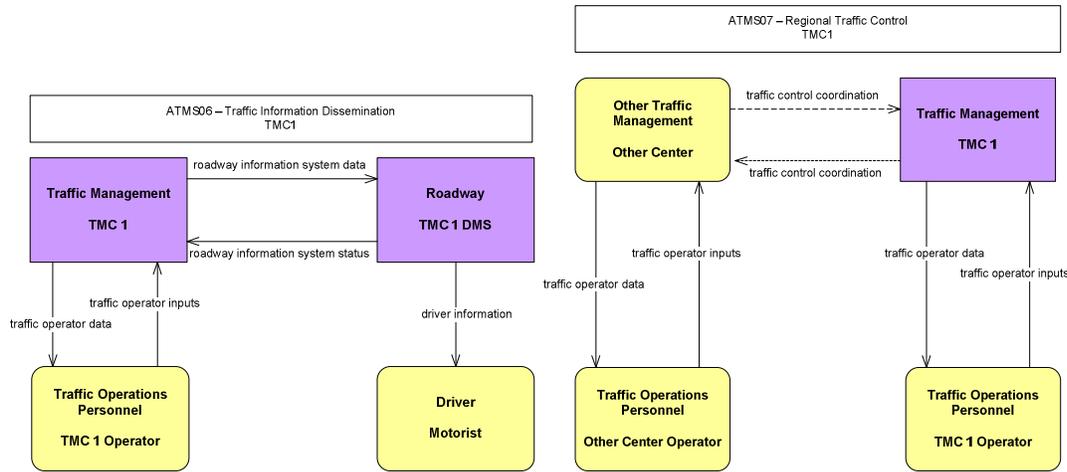


Table 3-1. User Classes

User Class	Description
Traffic Operations Personnel	Represents the human entity that directly interfaces with vehicle traffic operations. These personnel interact with traffic control systems, traffic surveillance systems, incident management systems, work zone management systems, and travel demand management systems to accomplish ITS services. They provide operator data and command inputs to direct systems' operations to varying degrees depending on the type of system and the deployment scenario. All functionality associated with these services that might be automated in the course of ITS deployment is modeled as internal to the architecture.
Driver	Represents the human entity that operates a licensed vehicle on the roadway. Included are operators of private, Transit, Commercial, and Emergency vehicles where the data being sent or received is not particular to the type of vehicle. Thus this terminator originates driver requests and receives driver information that

	<p>reflects the interactions which might be useful to all drivers, regardless of vehicle classification. The Driver terminator is the operator of the Basic Vehicle terminator. Information and interactions which are unique to drivers of a specific vehicle type (e.g., fleet interactions with transit, commercial, or emergency vehicle drivers) are covered separately.</p>
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Table 3-2. System Users sorted by User Class

User Class	System User	Description
Traffic Operations Personnel	TMC 1 Operator	Operators of TMC 1 responsible for monitoring and control of ITS devices, and roadway events, managed and operated by Agency Region 1. Operators communicate with operators via radio and system-to-system with other TMCs to managed incidents and roadway events within the region that impact multiple centers.
	Other Center Operator	Operators from another TMC or other center with center-to-center communication who may request information and or control related to Region 1 roadways.
Driver	Motorist	Traveling public.

3.1.2 User Roles and Responsibilities

Defining the user roles and responsibilities begins with the description of each user and is documented to cover roles and responsibilities as relates to the functions or portions of workflow that will be covered by the TMC 1 System. The roles and responsibilities will remain in sync with the information described in the operational scenarios.

Table 3-3. User Roles and Responsibilities

System User	TMC 1 System Concept	Roles and Responsibilities
TMC 1 Operator		<ol style="list-style-type: none"> 1. Operators of TMC 1 are responsible for monitoring and control (message display) of dynamic message signs. 2. Operators Track roadway events, managed and operated by Agency Region 1 to form new messages to notify the travelling public. 3. Other Center Operators may request the display of a particular message on the TMC 1 dynamic message sign -- the TMC 1 operator must assess and grant or reject the request for message display.
Other Center Operator		<ol style="list-style-type: none"> 1. Operators from another TMC may request information about dynamic message sign (status, current message, inventory) and request control of signs operated by TMC 1.
Motorist		<ol style="list-style-type: none"> 1. Travelling public read information displayed on dynamic message signs controlled by the TMC 1 to gather information to make more informed routing decisions.

3.1.3 User Needs Assessment

The user needs assessment below were developed during the User Needs Workshop. Needs were based on discussion with users about the following:

- **Vision.** What the outcome of the ITS System will be. For example, will provide travelers with real-time incident and diversion information.
- **Performance Measures.** Defines how well the the system is expected to performs. These measures help to quantify the organization/user expectations of the systems. Ideally, performance measures will trace directly to stated needs. For example, quantifying end-user needs will determine a measure of value of the system to the end-user vis-à-vis cost.
- **Gap Analysis.** A description of what operational or end-user need is lacking, or if an existing system, what system features are missing.

The table below documents the User Needs for the ConOps.

Table 3-4. Example ConOps User Needs

User	User Class	Description	Need	Expected Benefit	Performance Measure
Motorist	Driver	Traveling public.	Need to plan timely routes. Need to be notified of problems on roadways in order to avoid them.	Improved Travel Time. Improved safety in terms of reduction of incidents.	Travel Time. Number of incidents reported.
TMC 1 Operator	Traffic Operations Personnel	TMC 1 operators control TMC 1 ITS devices and monitor status of roadways.	Needs to provide warning and alerts to Motorists.	More timely provision of information, warnings and alerts to Motorists so they may change travel plans.	Timeliness of Warnings and Alerts. Wider geographic scope of coverage of alerts and warnings.
Other TMC Operator	Traffic Operations Personnel	Other TMC operators control TMC ITS devices and monitor status of roadways in other regions.	Needs to provide warning and alerts to Motorists.	More timely provision of information, warnings and alerts to Motorists so they may change travel plans.	Timeliness of Warnings and Alerts. Wider geographic scope of coverage of alerts and warnings.

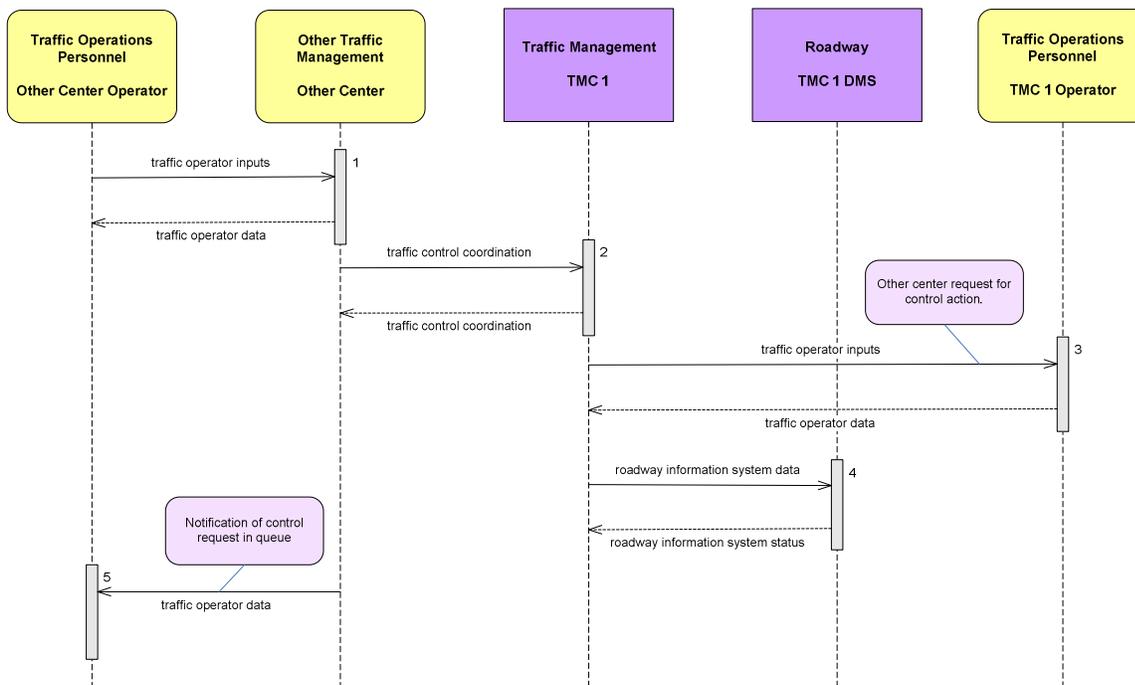
4 Operational Scenarios

The Operational Scenarios define sequence of activities to be performed to satisfy user needs, the information flows between entities. For example, it may include the procedures on how public safety agencies make requests for action, and how maintenance requests are monitored and made.

The figures and tables below illustrate two operational scenarios related to 1) Sharing of DMS information and control between two centers, and 2) DMS Control.

The operational scenario shown below is based on Market Package ATMS07 – Regional Traffic Control TMC 1 of the XYZ Region Regional ITS Architecture.

Figure 4-1. Operational Scenario: Provide Regional Traffic Control TMC 1

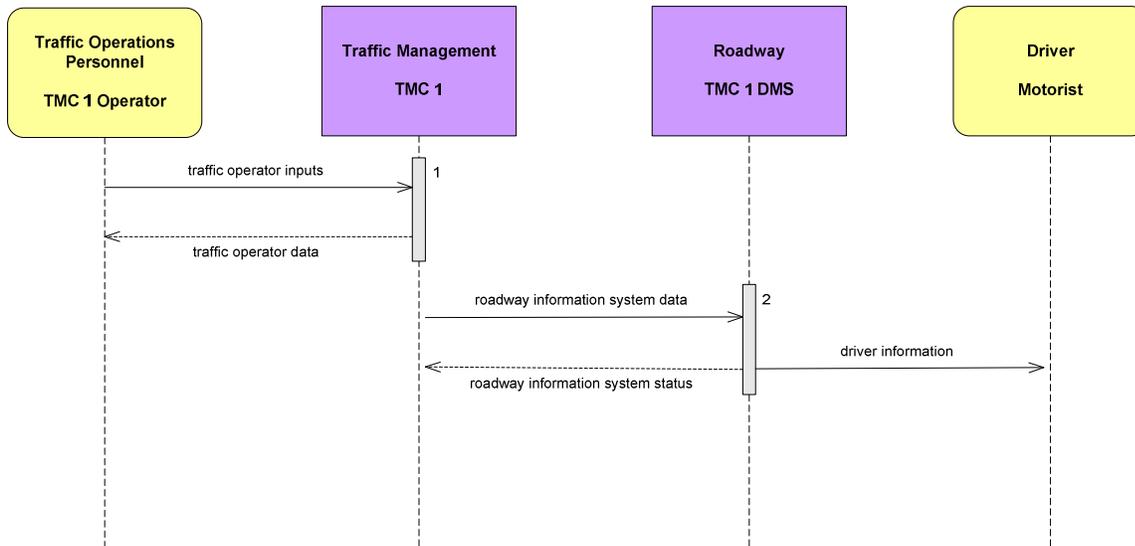


Operational Scenario Sequence of Events

1. This operational scenario begins when an operator from an external TMC provides to the external TMC a request to communicate with TMC 1 for information and/or control about TMC 1 DMS.
2. The TMC 1 provides status monitoring information and/or control of dynamic message signs on freeways to other traffic management centers.
3. The TMC 1 provides information about status information sharing and control requests to the TMC 1 Operator. The TMC 1 Operator may reject a control request.
4. The TMC 1 requests status updates and/or controls the TMC 1 DMS. The TMC 1 provides status information and control acknowledgement/rejection to the Other TMC.
5. The external TMC Operator is notified of shared monitoring information and/or control request acknowledgement/rejection.

The operational scenario shown below is based on the Market Package ATMS06 – Traffic Information Dissemination TMC 1 of the XYZ Region Regional ITS Architecture.

Figure 4-2. Operational Scenario: Provide Traffic Information Dissemination TMC 1



Operational Scenario Sequence of Events

1. The TMC 1 Operator can control the information displayed to travelers on dynamic message signs or other equipment along the roadway.
2. The TMC 1 controls the equipment on the roadway that displays information to Motorists.

