

Initial Annotated TMC Operations Manual Outline

September 2004

Introduction for Reviewers

This first outline has been developed to solicit review and comments from the TMC Pooled-Fund Study (TMC PFS) (SPR-2(207)) members. Comments received on this draft will influence subsequent drafts of the outline and the associated guide for developing a TMC operations manual.

This Initial Annotated Outline is based on various documents including Section 6 of the scope of work (SOW), the *ITE Annotated Outline for Traffic Management Center Operations Manual*, the TMC manuals posted on the TMC Pooled Fund web site (http://tmcdfs.ops.fhwa.dot.gov/cfprojects/new_detail.cfm?id=58&new=0) and a few other TMC manuals that are in the process of being finalized. The scope of work prepared by the TMC Pooled-Fund Study effort for this project contained a four and one-half page outline in Section 6 of the “Key Technical Topics” to be included. This Section 6 outline has been used to structure this *Initial Annotated TMC Operations Manual Outline*. An objective of this Initial outline is to vet that suggested outline and structure with the Pooled-Fund reviewers. The inclusion of a TMC outline in Appendix 1 is intended to provide another mechanism to verify the content of the outline for this guide.

Appendix 1 contains some sections that are focused on the TMC facility (like Section 10.5) and other sections that pertain to a specific activity or function (freeways for example). This is a different approach than the one used in the ITE outline where sections are not dedicated to specific functions. The strategy used in this Appendix is based on a Transportation Management System (TMS) where several functions and corresponding ITS Architecture “centers” and “terminators” are co-located. In this first version of the outline two functions (freeway and traffic signal operations) have been included.

One issue to consider when reviewing this document is the extent to which this guide and the TMC manuals that would be developed using the guide should be structured by function. A few examples of functions and activities that could be included are: freeway operations, traffic signal operations, HOV lane management, and transit priority management. Each of these functions could have their own policies (especially if multiple agencies are involved), their own concept of operations and their own procedures.

Another consideration is that there are no sections (other than policy level) in this Initial Annotated Outline for special events such as a hurricane, a homeland security emergency or a major public sporting or cultural event. These events may require special procedures and unique interagency actions.

Therefore, in addition to the details included within each section a reviewer might comment on the structure of the document with respect to including sections organized around agencies, functions / activities, events and/or the facility.

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Initial Annotated Outline

1. INTRODUCTION

1.1. Purpose

Identifies the purpose of the document and its objectives; the description will be based on the text included in the SOW that said in part the following.

“The purpose of this project is to develop a technical document that provides guidance and recommended practices on the need for, how to develop, maintain, and use an operations manual to guide the day-to-day management and operation of a Transportation Management System (TMS) and its center (TMC).”

This section may include a short statement of the transportation community recognition of the need for an operations manual. One reference for stating the need is the 1999 document “Management and Operations of Intelligent Transportation Systems—An ITE Recommended Practice” (ITE Publication No. RP-030A).

1.2. Intended Audience (Primary and Secondary)

Identifies intended audience of the document (primary and secondary); the description will be based on the text included in the SOW that said in part the following.

“It is intended to be a valuable resource for individuals that may be responsible for or involved in managing, developing, implementing, operating, maintaining, or supporting a TMS.”

The description of the audience can be linked to the relevant ITS system users identified in the ITS Architecture. Table 3.3-1 of the October 2003 Mission Definition document (<http://www.iteris.com/itsarch/documents/zipped/mission.zip>) summarizes these users. This ITS Architecture connection can help clarify the organizational and functional affiliation of each audience member.

The identification of the audience can also be linked to the steps in the systems life cycle. This will help clarify when each audience member can most effectively contribute and benefit from the manual, especially for new and updated systems. A message that be emphasized is that the Operations Manual can and should be developed in pieces throughout the life cycle of a new or updated system.

The following life cycle drawing can be used repeatedly in the document.

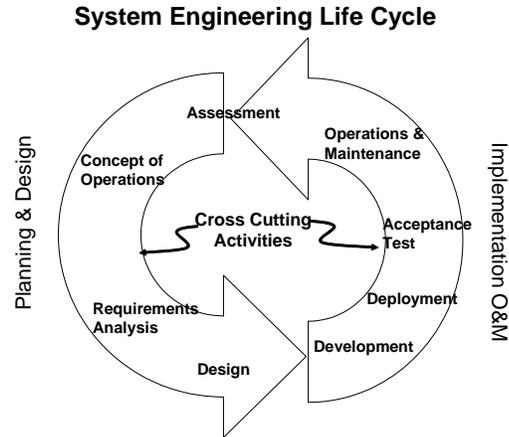


Figure 1 -- System Life Cycle

A third approach for describing the audience is to cross-reference them to applicable professional development categories where appropriate such as: “Guidelines for TMC Transportation Management Operations Technician Staff Development” (http://tmc-pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/Guidelines%20for%20TMC%20TMOT%20Staff%20Development.doc) and the “Building Professional Capacity in ITS” series available through the ITS Electronic Document Library (http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/6X101!.PDF). Connecting the audience to titles relevant to professional capacity building can facilitate training and outreach activities.

1.3. Challenges in Developing and Sustaining TMC Operations

Provides a high-level discussion of the important benefits and challenges that agencies face with developing, implementing, managing and sustaining TMC operations;

Topics can include “traditional” issues such as staffing (a.k.a. FTEs), training, staff retention, budgeting, tools, career paths, and the construction culture that exists in many agencies. It can also include topics and ideas that followed from the National Summit on Transportation Operations such as: no institutional ownership of congestion and related problems and the existence of multiple stakeholders (see <http://www.ite.org/NationalSummit/summit/FindingsMatrix.pdf>).

1.4. Why Develop a TMC Operations Manual?

Defines and describes the role, identifies the benefits, discusses the need for, and provides a basis for why agencies should pursue developing a TMC operations manual. Also includes a brief description of the components of an operations manual and how it can be used to support TMC operations as well as services and functions provided by a TMC;

This section can cite improvements to mobility, safety, the environment, productivity, and customer satisfaction when procedures are written in a TMC manual and followed. It can also describe personnel related benefits such as training and job description and performance enhancements. It can also describe risk mitigation activities and benefits.

1.5. Key Issues

Provides an overview of the key issues and considerations associated with developing, using, and sustaining a TMC operations manual that may include: method, process, techniques, different types of TMCs, functions and services provided, stakeholders involved, organizational structure, and opportunity and potential management processes to initiate and include in an operations manual;

1.6. Relationship to Other Manuals, Policies and Procedures

Provides a context of an operations manual for a TMC and how it may relate or contrast with the operations manuals, procedures, and policies for other traffic operations programs, planned special events, incident management, or corridor management programs and plans within an agency, metropolitan area, or region;

1.7. State-of-the-Practice

Describes the current state-of-practice, trends, and gaps related TMC operations manuals developed, how they are being used, effectiveness, processes implemented based on these manuals, needs of agencies, and areas for improvement;

1.8. Resources

Indicates other national resources that have been initiated or exist related to this subject and how this document is intended to address this gap. Also indicates the other products that will be produced with this project to assist agencies with advancing the use of an operations manual within their agency and/or region for TMCs;

The TMC Pooled-Fund web site is a good source citing specific TMC manuals that are being shared with the operations community (http://tmcdfs.ops.fhwa.dot.gov/cfprojects/new_detail.cfm?id=58&new=0). The Appendix (Chapter 10 APPENDIX 1: TMC MANUAL CHECKLIST) contains an enhanced version of the ITE Annotated Outline for a TMC (<http://www.ite.org/bookstore/ir107.pdf>) and will be referenced throughout the Handbook.

This section will also describe the other deliverables identified in the SOW including the project fact sheet, tri-fold brochure, primer, questions & answers and distribution plan.

1.9. Fulfilling Agency Requirements

Describes how this document will meet the needs of agencies, can it can be used by practitioners, and have the desired influence on the practice related to managing and operating TMCs and developing operations manuals;

1.10. How the Handbook was Developed (Methodology)

Provides an overview and description of how this document was developed;

A short three-quarters page summary of the Pooled-Fund SOW for this handbook project will be developed and included in this section.

1.11. How to Use the Handbook

Describes how key typical users (intended audience) should use this document;

1.12. Overview of Handbook Content

Provides an overview and description of the document;

1.13. Organization of the Handbook

Describes the organization of the document; Identifies and provides a brief overview of each chapter and key topics covered.

2. TMC OPERATIONS MANUAL: OVERVIEW

2.1. Introduction

2.1.1. Chapter Purpose

The intent of the chapter is to provide a high-level overview of the operations manual, to identify the requirements in an operations manual, and describe how those requirements relate to and are importance to day-to-day operations of a TMC. This chapter provides an option to the reader, with limited or no experience with the subject of this document, to read one chapter to get a very high-level overview of the topics or allow them to use the rest of the document.

2.1.2. Key Issues of the Chapter

Describes key issues and the context of material to be presented related to the overall subject matter of the entire document and this specific chapter;

This chapter provides the reader with a basic understanding of the subject matter, key topics and issues to be covered in the document, and why and how they apply and influence the operations and maintenance of TMCs and transportation management systems.

2.1.3. Relationship to Handbook Document

Describes the relationship of this chapter to other chapters; How information contained in this chapter will help the reader to progress and build toward other subjects in subsequent chapters of the document; What are the titles of remaining sections in this chapter.

2.2. Concept of Operations and Requirements for a TMC Operations Manual

This overview addresses additional issues and provides greater depth than was appropriate in only several pages in the Introduction chapter. The information will allow the reader to understand these concepts and issues as they relate to the application of the subject matter, and decide what additional chapters to read and the sequence, based on their individual experience, expertise, job responsibilities, or activities.

Emphasis can be given to the role of stakeholder involvement in defining a concept of operations.

2.3. Successful Practices

Highlights successful practices and programs that reinforce recommended guidance and best practices identified in the document.

3. TRAFFIC OPERATIONS PROGRAMS AND TMS PROGRAMS, POLICIES, STRATEGIC PLANS, OPERATIONAL PROCEDURES, PROTOCOL, AND/OR PRACTICES

3.1. Chapter Purpose

Provides the context around which a TMC fits organizationally within an agency, region or metropolitan area; what functions and services do TMCs typically support; role, responsibilities, and capabilities of a TMC; importance and techniques to justify and report on the performance or influence that a TMC may have on these services or transportation system.

3.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

3.3. Relationship to Handbook Document

This chapter sets the framework around which a TMC

3.4. Concept of Operations

Since the ITS Architecture requires “an operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture” (see http://www.its.dot.gov/aconform/940_9.htm), many regions will be able to leverage their Architecture work to develop a context to define TMC operations. In addition many regions within the U.S. have posted their ITS Architecture to web sites. Therefore many examples of a concept of operations are available. This section will suggest using the ITS Architecture work to leverage the development of a TMC concept of operations.

In addition, Section 4.3 of the document “Developing, Using and Maintaining an ITS Architecture for Your Region” (<http://www.iteris.com/itsarch/documents/zipped/guidance.zip>) has a good set of strategies to use in developing a concept of operations.

3.5. Relationship to Other Manuals, Policies and Procedures

Identifies the role and relationships of a TMC and its operations manual to other strategic plans, operations programs, plans, policies, and procedures, planned special events, incident management, and corridor management within a region, metropolitan area, or agency.

This section could list the typical agencies and departments that may have policies and procedures that impact a TMC. These documents could be organized by function (either using the [National ITS Architecture](#) or the list of 16 TMC functions defined in Section 3.1 of “[Guidelines for TMC Transportation Management Operations Technician Staff Development](#)”) as a starting point. In addition it can suggest the administrative, human resource and information service policies that might apply and highlight their potential impacts on TMC operations.

3.6. Integrating TMC Policies and Procedures into Agency Policies and Procedures

Identify opportunities, processes, and techniques to integrate TMC operations policy and procedures into these strategic plans, operations programs, policies, and procedures.

3.7. Key Topics for Daily Operation

Review and distinguish between the principles, objectives, characteristics, components, performance measures, and other key issues associated with TMS day-to-day operation

4. TYPES OF TMC, FUNCTIONS, SERVICES PROVIDED, AND OPERATIONS

4.1. Chapter Purpose

4.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

4.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

4.4. Key TMC Types of Operations

Identify key types of TMC operations that may be based on the structure and complexity of the organization, functions and business services supported and provided, capabilities of a TMC, agencies involved, and other key considerations (e.g., co-location, common systems used, etc.).

A key list of operations and functions can start using the [National ITS Architecture](#) or the list of 16 TMC functions defined in Section 3.1 of "[Guidelines for TMC Transportation Management Operations Technician Staff Development](#)". Both ITS Market Packages and User Services provide a service-oriented view of ITS that can be used to support ITS service selection for a TMC. Aspects of these documents and the TMC Pooled-Fund [Business Planning Handbook](#) can be incorporated into this write-up.

4.5. Structural and Institutional Considerations TMC

Identify types of operations supported, functions, and services provided within a TMC. Briefly describe how and indicate what are the contributing factors for agencies when making decisions to develop a TMC, co-locate a TMC with other agencies or programs, provide specific functions, determine hours of operation, and support individual services. Briefly discuss and identify why some agencies decide not to provide or support specific functions or services.

5. TMC OPERATIONS MANUAL COMPONENTS

5.1. Chapter Purpose

5.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

5.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

5.4. Inventory

Identify resources for an inventory of TMC components, field devices, functions, services provided, area of coverage, capabilities, and control center resources, and describe how to use those resources in day-to-day operations.

5.5. Daily Operations

Identify components of an operations manual to support daily operations of a TMC. The components include but are not limited to: personnel and organizational structure, hours of operation, staffing requirements, operations concept, policies and procedures, control plans, remote operation, security procedures, startup and shut down procedures, failure recovery, command structure, emergency contact numbers, notification procedures, operational logs, maintenance policies, procedures, and plans, data archiving and warehousing, emergency procedures, and interagency coordination.

5.6. The Organizational Setting

Document existing organizational structure, state, regional and agency specific policies and procedures, TMC and operator policies and procedures, missions, goals, functions and services provided and supported, roles and responsibilities, and performance measures that may influence the components and structure of a TMC operations manual

5.7. Organizational Representation Within the TMC

Identify types of organizational structure (e.g., 1 agency, multiple programs within agency, multiple agencies, multiple functions and services provided) and how it may influence the components and structure of the TMC operations manual.

5.8. Performance Monitoring

Provide a concept of establishing baseline of performance for portions of transportation systems covered by TMC and the assessment of current influence of TMC on performance. It should also provide an overview of vision, mission, goals and objectives, and performance measures (performance monitoring, data collection, archiving data, evaluation & performance reporting) supported by a TMC. It should provide overview of:

- *establishing thresholds for performance measures based on proposed future TMC capabilities; and*
- *management systems and processes to support management, continued operation, and provision of necessary services for TMC.*

6. PROCESSES & TECHNIQUES TO DEVELOP & UPDATE AN OPERATIONS MANUAL

6.1. Chapter Purpose

The purpose of this chapter is to identify methods, processes, techniques, and tools to develop and update an Operations Manual for TMCs.

6.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

6.3. Relationship to Handbook Document

6.4. How to Develop a Manual – Starting from the Beginning

It should discuss issues to consider, constraints, institutional issues, and other key factors that influence the update or initial development of a TMC Operations

Manual. Potential stakeholders to include and how to integrate them into the process of developing or updating an operations manual should also be identified.

6.5. How to Update an Existing Manual

Discuss and distinguish processes and techniques between developing and updating an Operations Manual for a TMC. Data, information sources, analytical tools, and analysis that should be performed in support of identifying recommendations for the TMC shall be identified.

6.6. Dealing with TMC Complexity, Maturity and ??

Indicate how the guidance and lessons learned that are presented in this chapter may differ for a complex, basic, mature, or new TMC.

7. IMPLEMENTING OPERATIONS MANUAL – HOW TO GET STARTED

7.1. Chapter Purpose

The purpose of this chapter is to describe the roles, relationships, and differences with different organizational management structure, and how they relate to TMCs.

7.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

7.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

7.4. Management Structures

Identify the purpose, characteristics, tools, resources required, similarities, differences, and other key factors with different management structures in a typical TMC and those required to support the operations of a TMC. Distinguish if these management structures exist or how they may vary based for a complex, basic, mature, or a new TMC. Also, identify and prioritize the typical management structures that may be needed to operate and manage different types of TMC.

8. PERFORMANCE MEASURES, MONITORING, EVALUATION, & REPORTING

8.1. Chapter Purpose

The purpose of this chapter is to identify typical range of performance measures for TMC operations manuals.

8.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

8.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

8.4. Types of TMC Performance Measures

Also indicate what family of measures may also be needed for specific stakeholders. These performance measures should be mapped to the applicable goals and objectives (e.g., mobility, safety, environment, productivity, customer satisfaction) of a TMC, traffic operations program, agency, and strategic plan.

8.5. Establishing Performance Measure Thresholds

Identify the process, analysis performed, issues to consider, and typical time horizons associated with establishing future thresholds for these performance measures.

8.6. Collecting Performance Data

Identify data element, sources, and techniques for collecting and archiving information to support the development of these performance measures. Identify techniques, technologies, and methods to collection, process, and archive data.

8.7. Processing and Reporting Performance Data

Identify the methods, process, analysis performed, tools utilized, level of effort, and reporting on the performance of a TMC operations manual, specific functions performed, operational strategies, or the associated roadway network.

9. CASE STUDY CHAPTERS (4-5 CHAPTERS)

9.1. Chapter Purpose

The purpose of this chapter is to provide examples

9.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

9.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

9.4. Case Study Description

Each of the remaining 4-5 chapters of this technical document will highlight a successful practice as an example that reinforces key recommendations and practices identified in the previous chapters. The intent of these chapters are to provide examples or case studies that build off of and demonstrate how the concepts, techniques, and guidance that are identified in the earlier chapters of this document can be applied within an agency or program associated with a TMC or traffic operations program. If case studies do not exist related to these, or other topics that the Contractor and COTM identify, practices related to specific topics or issues from individual agencies should be combined and presented as one example or case study.

9.5. Case Study Key Issues

For each of the examples of case studies that are presented, detailed information will be prepared to identify the breadth and depth of the issues that should be considered associated with a particular application. Where possible this information should be presented in the form of lists, flow charts, graphs, diagrams, and other formats to easily depict the key issues to be considered.

Sample chapters highlighting similar examples or case studies can be obtained from the TMC PFS web page for the "Managing Travel for Planned Special Events" handbook located at:

http://tmcdfs.ops.fhwa.dot.gov/cfprojects/new_detail.cfm?id=59&new=0

APPENDICIES

10. APPENDIX 1: TMC MANUAL CHECKLIST

10.1. Chapter Purpose

The purpose of this appendix is to provide a checklist of topics for a TMS / TMC Manual. Some sections of this appendix can be linked to

10.2. Key Issues of the Chapter

To be completed during a subsequent version of the Annotated Outline.

10.3. Relationship to Handbook Document

To be completed during a subsequent version of the Annotated Outline.

10.4. Emergency And Other Contact Numbers

Quick reference for emergency situations. Depending on agency (Municipal, State Highway, Tollway, Transit, etc), contacts will be subdivided into: inter-agency; intra-agency; and private entities. Typical contacts include the following.

- *TMS Operations, maintenance and supervisory personnel contacts (home phone number, pager, cell hone number, portable communications device email address, instant messenger ID)*
- *Police, fire, EMS, motorist assistance patrols, PSAP*
- *Street maintenance, freeway maintenance*
- *Private information providers, media*
- *Other*

In regions characterized by a large number of jurisdictions, supplemental maps illustrating the physical boundaries for agency responsibilities could be included.

10.5. Emergency Control Room Procedures

Quick reference for emergency action in control room (not traffic management or homeland security issues)

10.5.1. TMC Emergency Plan

Operator action in the case of occurrences such as:

- 10.5.1.1. Fire
- 10.5.1.2. Smoke
- 10.5.1.3. Flood
- 10.5.1.4. Earthquake
- 10.5.1.5. Security
- 10.5.1.6. Power Loss
- 10.5.1.7. Communications Loss
- 10.5.1.8. Evacuation

10.5.2. System Operation Shutdown/Restoration

Quick reference for system shutdown

- 10.5.2.1. Shutdown
- 10.5.2.2. Startup

10.5.2.3. Failure Recovery

10.6. General Policies

General policies for building security, equipment use, training, etc.

10.6.1. Update Status and Record

Version or date of current policy

10.6.2. Change Policy

Procedure and authorization to change/suspend policy

10.6.3. Homeland Security

Procedures when directed by outside agency to take action (e.g. FBI directs operator to display message on DMS)

10.6.4. Severe Weather Conditions

Actions for personnel in severe weather (do they come in to work, can they leave work, who authorizes)

10.6.5. Visitor and Tour Policy

Authorization, scheduling, and handling of visitors

10.6.6. Citizen service requests

Where received, how logged, response time policies, etc.

10.6.7. System and Non-System Equipment

Policy on use of system and non-system equipment

10.6.7.1. General Equipment

10.6.7.2. Operator Specific Equipment

10.6.7.3. General Agency Property

10.6.7.4. Telephone and Fax Usage

10.6.8. TMC Cleaning and Maintenance

When, who, special precautions

10.6.9. Building Security

Who can access the building and how do they access it

10.6.10. Pass Keys and Controlled Access

Who can access control, communication, and equipment rooms

10.6.11. Work Shifts, Organization Chart Breaks and Lunch

10.6.12. Training Schedule

General information for staff

10.6.13. General Policies (May be covered in agency personnel policies)

Uniform and Dress code; Drug-Free Workplace Policy, Smoking Policy

10.7. Operational Concepts – Freeway Management Systems

Overall concept description enabling user to visualize goals, objectives, and how the discreet parts fit together to accomplish those objectives

10.7.1. Goals of the Traffic Management System

Concise statement of goals and objectives of the TMS and how general components work together (Detection, response, data collection and storage)

10.7.2. Interagency and Inter- Jurisdictional Coordination

Description of need for interagency and interjurisdictional cooperation and coordination with other stakeholders.

10.7.3. Malfunction Response

Dispatch maintenance, logging, testing

10.7.4. Traffic Monitoring

Description of traffic monitoring devices such as:

10.7.4.1. Speed Detector Monitoring and Response

10.7.4.2. CCTV

10.7.4.3. Recording Video Images

10.7.4.4. Road Construction Monitoring

10.7.4.5. Diversion Route Planning

10.7.4.6. Highway Maintenance Activity

10.7.5. Traffic Response

Response to planned or unplanned events, general description of functionality

10.7.5.1. Dynamic Message Signs (DMS)

Overview of uses of DMS

10.7.5.2. DMS Message Priority

10.7.5.3. Display of Travel Times

10.7.5.4. Blank Signs

10.7.5.5. Operation of DMS by Law Enforcement Personnel

10.7.5.6. Traffic Diversion

General description of when diversion is warranted and policy on diverting to specific roadways

10.7.5.7. General Policy

10.7.5.8. Full Freeway Closure

10.7.5.9. Diversion to Roadways Not Under the Jurisdiction of Agency

10.7.5.10. Highway Advisory Radio

10.7.5.11. Lane Control Signals (LCS)

10.7.5.12. Ramp Metering

10.8. Field Devices – Freeway Systems

Functional description and locations of field devices in TMS

10.8.1. DMS

10.8.2. CCTV

10.8.3. Detectors

- 10.8.4. HAR
- 10.8.5. LCS
- 10.8.6. Communication Media
- 10.8.7. Other
- 10.9. Operational Concepts – Traffic Signal Management Systems
 - Overall concept description enabling user to visualize goals, objectives, and how the discreet parts fit together to accomplish those objectives*
 - 10.9.1. Goals of the Traffic Signal Management System
 - Concise statement of goals and objectives of the TMS and how general components work together (Detection, response, data collection and storage)*
 - 10.9.2. Interagency and Inter-Jurisdictional Coordination
 - Description of need for interagency and interjurisdictional cooperation and coordination with other stakeholders.*
 - 10.9.3. Control Area
 - Description of control area, number of signals, map, system boundaries, jurisdictional boundaries,*
 - 10.9.4. Traffic Signal Operations
 - Description by region/sector: isolated, pre-timed, traffic responsive, system coordination, adaptive operation, etc*
 - 10.9.5. Agency Responsibilities in Developing Signal Timing
 - Who within agency determines signal timing parameters, schedules, update frequency, etc*
 - 10.9.6. Incident Operations
 - Operations during freeway traffic diversion, roadway accidents, weather, natural disaster, logging etc*
 - 10.9.7. Equipment Malfunction Response
 - Dispatch maintenance, logging, testing*
 - 10.9.8. Record Keeping
 - Summary of records, logs to be maintained*
- 10.10. Field Devices Traffic Signal Systems
 - Functional description and locations of traffic signal field devices in TMS*
 - 10.10.1. Signal Heads
 - 10.10.2. Controllers
 - 10.10.3. Detectors
 - 10.10.4. LCS
 - 10.10.5. DMS
 - 10.10.6. CCTV
 - 10.10.7. Communication Media

- 10.10.8. Other
- 10.11. Control Center Description
 - 10.11.1. Location
 - Address, maps, lat/long, location within agency campus*
 - 10.11.2. Access/Security
 - See 10.6.9 and 10.6.10 above—may not need in both places.*
 - 10.11.3. Layout
 - General plan view layout of control center to include:*
 - 10.11.3.1. Fire Suppression
 - 10.11.3.2. Power Source/Location
 - 10.11.3.3. HV/AC
 - 10.11.3.4. Data Communications
 - 10.11.3.5. Voice Communications
 - 10.11.3.6. Network Communications
- 10.12. Daily Operation
 - 10.12.1. Management Center Functions
 - Either repeat previous description or refer to previous description*
 - 10.12.2. Personnel
 - Typical staffing including job titles and brief duties, designated supervisor for shifts.*
 - Operations, maintenance and supervisory personnel contacts (home, pager, cell)*
 - 10.12.3. Hours Of Operation
 - Workdays, holidays, weekends, nights, special events, emergencies.*
 - 10.12.4. After Hours On-Call Roster
 - Operations, maintenance and supervisory personnel contacts (home, pager, cell)*
 - 10.12.5. Remote Operation
 - Authorized personnel for remote operation; circumstances for remote operation.*
 - 10.12.6. Security Procedures
 - Control of access to interfaces and various levels of access*
 - 10.12.7. Maintenance Checklist
 - Routine checklist*
 - 10.12.8. Telephone Call Etiquette
 - Courtesy, helpfulness, referring callers*
 - 10.12.9. Citizen service requests
 - Receipt, logging, dispatching, closing*
 - 10.12.10. Contact With Media and the Public
 - Who can talk to media, what information can be furnished,*

- 10.12.11. Coordination and Dispatch of Motorist Assistance Patrols (Freeway)
- 10.13. Control System Operation Procedures-Freeway
 - This section will depend greatly on the individual system but typical functions can be modified or deleted if not applicable.*
 - 10.13.1. System Start-Up Procedures
 - 10.13.2. System Shut Down Procedures
 - 10.13.3. Operator Interface
 - Typical pictures of interfaces where applicable*
 - 10.13.3.1. Operator Console
 - 10.13.3.2. Closed Circuit TV (CCTV)
 - 10.13.3.3. Dynamic Message Signs (DMS)
 - 10.13.3.4. LCS
 - 10.13.3.5. HAR
 - 10.13.3.6. Motorists Assistance Patrol
 - 10.13.3.7. Police Communication
 - 10.13.4. Incident Management Procedures
 - Procedures will vary widely among agencies but typical example will be provided. Response will include both actions to be taken to respond as well as notification of other agencies.*
 - 10.13.4.1. Reported Incidents
 - 10.13.4.2. Detected Incidents
- 10.14. Control System Operation Procedures-Traffic Signals
 - This section will depend greatly on the individual system but typical functions can be modified or deleted if not applicable.*
 - 10.14.1. System Start-Up Procedures
 - 10.14.2. System Shut Down Procedures
 - 10.14.3. Operator Interface
 - Typical pictures of interfaces where applicable*
 - 10.14.3.1. Operator Console
 - 10.14.3.2. Closed Circuit TV (CCTV)
 - 10.14.3.3. Dynamic Message Signs (DMS)
 - 10.14.3.4. LCS
 - 10.14.3.5. HAR
 - 10.14.3.6. Police Communication
 - 10.14.4. Incident Management Procedures

Procedures will vary widely among agencies but typical example will be provided. Response will include both actions to be taken to respond as well as notification of other agencies.

10.14.4.1. Reported Incidents

10.14.4.2. Detected Incidents

10.15. TMC Maintenance Procedures

Routine maintenance to be performed by operators. Anything beyond that would be performed by contract or agency maintenance personnel.

10.15.1. Routine Maintenance

Typical daily checks, adjustments, and component exchange

10.15.2. Preventative Maintenance

Scheduled by agency maintenance personnel or contractor

10.15.3. Spare/Backup Equipment

Inventory of spare and backup equipment. Listing of vendors and suppliers.

10.15.4. Emergency

Notification procedures for major failures

10.15.5. Agency Maintenance

Listing of maintenance to be performed by agency personnel

10.15.6. Contract Maintenance

Criteria for calling in contract maintenance, phone, fax, and pager listings. Authorized agency personnel to authorize repairs.

10.16. System Operations Logs

Denoting historical logging procedures(manual and automated) as determined by management within capability of specific system.

10.16.1. Operations

Operations periods, on-line/offline times, manual intervention, etc

10.16.2. Maintenance

Malfunctions, outages, resolution of problem, etc

10.16.3. Citizen service requests

Requests for service (e.g., signal timing, DMS displays)

10.16.4. Events

Planned and un planned events, road closures, etc

10.16.5. System Reports

System evaluation operation parameters, etc.

10.16.6. Traffic Data

Historical data, analyses, etc.

10.16.7. Risk Management

Guidance of what types of data to store and for how long in response to agency risk management policies.

10.17. System Documentation

Listing of available documentation and where it is stored or filed, procedures to update.