



Pomona Valley ITS Project

Project Deliverable 5.3.2 **Subregional TMC Report** **Project Deliverable 6.1.6** **Subregional TMC Schematic Diagrams**

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PROJECT DESCRIPTION

The County of Los Angeles, in cooperation with the cities within the Pomona Valley, has determined that development of an Intelligent Transportation System (ITS) in the Pomona Valley would help to reduce congestion, enhance mobility, provide traveler information during non-recurring and event traffic congestion, and manage event traffic. The Pomona Valley Intelligent Transportation Systems (PVITS) project was conceived as a recommendation from the Pomona Valley ITS Feasibility Study completed by the LACMTA in 1995. The ultimate objectives of the Project are to:

- Improve mobility by optimizing traffic management on arterials and freeways;
- Enhance Route 60 capacity by better coordinating freeway traffic with parallel arterials;
- Improve agency efficiency by coordinating management of operations and maintenance efforts among and between agencies; and
- Increase agency staff productivity by providing low-maintenance, high-quality communications and computational tools to assist in daily management and coordination activities.

Phase 1 of the PVITS project is the development of a conceptual design that defines solutions to enhance capacity, reduce congestion, and improve traveler information in the Pomona Valley.



1.0 BACKGROUND

1.1 Purpose of Report

This document describes the requirements of subregional Traffic Management Center (TMC) for the Pomona Valley region. This site will be the location of the computer systems that will enable the presiding agency to monitor and/or control signal operations and congestion both in that city and in all other agencies in the Pomona Valley and to share information within the Forum and between Forums. The Subregional TMC will house the following functions (provided by the systems whose requirements are documented in **Deliverable 5.1.1 – ATMS User Requirements Report, Deliverable 5.2.1 ATMS Functional Requirements Report, Deliverable 5.7.1 – ATIS Requirements Report**):

- Monitoring and control of traffic signals
- Monitoring and control of other ITS devices (such as CCTV cameras, dynamic message signs (DMS) or Trailblazers)
- Monitoring of and input to the subregional advanced traveler information system (ATIS)
- Processing and dissemination of information related to the subregional ATIS
- Monitoring and sharing of control of CCTV cameras with other jurisdictions
- Monitoring and sharing of video images from CCTV cameras and video detection
- Monitoring and sharing of data from the traffic control system

This document also depicts typical subregional TMC site diagrams.

1.2 Methodology

This document describes the spatial, communications, workstation, and video display requirements that are expected of a subregional TMC location. As the subregional TMC location has not yet been identified (see **section 2.1** for location options), the schematic diagrams provided are typical examples of the layout requirements of this facility. This document will be used as a precursor to the alternatives analysis in Task 7 and the recommendations provided in Task 8 that will determine the location of the subregional TMC.

1.3 Report Organization

The information in this report is presented in the following sections:

Section 1 – Background

Section 2 – Requirements

Section 3 – Typical Schematic Diagrams

2.0 REQUIREMENTS

Like the other Local Control Center (LCC) sites in the Pomona Valley, the subregional TMC is the location where the local management and system access and subregional system monitoring and sharing of information will take place for the city at which the subregional TMC is located. Additionally, the



subregional TMC will house functions such as the subregional ATIS processing and dissemination and housing of the IEN server (described below). The subregional TMC may also serve subregional traffic management and control roles in the future as the Pomona Valley member agencies decide. For example, during a major event outside of operating hours for an LCC, the subregional TMC may have the ability to implement pre-agreed-upon timing plan changes to signals in the subregion that are not necessarily in the subregional TMC's jurisdiction.

The subregional ATIS server will collect information from each of the member agencies, process the data, and then disseminate it to various communication media such as the Internet, kiosks, dial-in services (511), HAR and community access television (CATV). The requirements for the ATIS are defined in **Deliverable 5.7.2 – Final ATIS Requirements Report**.

The IEN server for the Pomona Valley will allow the various agencies within the Pomona Valley to share information and potentially share control of devices within the subregion, as well as share information (monitoring) with agencies and stakeholders in other areas of LA County. This server is a part of a county-wide network that was defined and designed as a part of the San Gabriel Valley Forum Pilot Project. The purpose of the network is to provide a standard means of communicating among different agencies' signal systems within LA County. Each Forum, or subregion, of LA County will have its own IEN server that will enable the communication to occur within that Forum and from that Forum to other Forums/ agencies within the County. The IEN supports second-by-second data sharing for intersection data.

It is envisioned that there will be one subregional TMC for the Pomona Valley. There are three basic types of systems or levels of control that will be installed in the Forum. These levels were defined under a separate contract currently underway in LA County:

- Level 1 – Subregional and local monitoring only
- Level 2 – Subregional and local monitoring and control ability with a new ATMS to be provided by the current LA County Forum projects
- Level 3 – Subregional and local monitoring and control ability with an existing ATMS

This report focuses only on the requirements of the subregional TMC that would fall into the Level 2 or Level 3 category. Deliverables 5.3.4 and 6.1.4 address the requirements of a Local Control Center.

While the location for the subregional TMC has not yet been determined (it will be determined during Task 7 – Alternatives Analysis and Task 8 - Recommendations), the following are the current options for location:

- City of Pomona Transportation Center
- Fairplex in Pomona
- AQMD in Diamond Bar
- LA County's future TMC in Alhambra

The requirements are expressed as a series of “shall and will” statements that describe functionality. These requirements are typical and will be refined and further developed once the operational requirements and systems analysis has been performed.



2.1 Spatial Requirements

- The subregional TMC shall be designed to fit within the specific spatial requirements and availability of space for the location chosen.
- The subregional TMC shall be developed on a site requiring minimum cost for construction.
- The subregional TMC shall be sized to accommodate the operations staff, administrative staff, management staff, and maintenance staff (if required in the same location).
- The subregional TMC control room shall be designed to accommodate needed line of sight for each operator to adequately view the video wall.
- The subregional TMC control room shall be designed to accommodate an adequate number of workstations, based on industry standard and agency-preferred workstation sizes, layouts, and configurations.
- The subregional TMC shall be sized to accommodate the computer system and related equipment.
- The subregional TMC shall employ means to protect from and detect unauthorized access, tampering, and destruction of critical system information and components.
- The subregional TMC shall be designed to protect the operations room and communication and computer equipment rooms from unauthorized access.
- The subregional TMC shall provide access sized to accommodate all necessary equipment to be moved in and out of the rooms and building as required.
- The subregional TMC shall meet ADA requirements.
- The subregional TMC shall have a location where meetings can be held that is separate from the operations room. It is preferred that this location be a dedicated conference room for the TMC staff and related visitors.
- The subregional TMC shall have the potential for future expansion to accommodate the ultimate build-out estimated to accommodate future equipment and staffing needs.

2.2 Communications, Lighting and Power Requirements

- The subregional TMC shall be developed on a site requiring minimum cost for communication to field devices.
- The subregional TMC shall be sized to accommodate all necessary communications and related equipment.
- The subregional TMC shall supply adequate heating, ventilation, and air conditioning (HVAC) required for computer, communications, and associated equipment maintenance.
- The subregional TMC shall allow for upgrading of power in the allotted space(s) to accommodate the video wall, operator workstations, computer, communications, and other associated equipment.
- The subregional TMC shall allow for upgrading of lighting to accommodate the needs of the operations room.
- The operations room at the subregional TMC shall allow for lighting to be dimmable.
- The operations room at the subregional TMC shall allow for lighting that is incandescent.
- The operations room at the subregional TMC shall allow for task lighting at the operator workstations.



- The subregional TMC shall provide fire suppression system(s) in the operations room and computer equipment areas.
- The subregional TMC shall provide for adequate hidden space for computer cabling within the operations room and between the operations room and the computer/ equipment rooms. This may be achieved by a raised floor or other, similar means.

2.3 Implementation Costs

- The subregional TMC shall make use of existing infrastructure as much as possible in the design and construction of the facility.
- The subregional TMC shall be designed to coordinate various agencies’ needs that are collocating in the same facility as much as possible in the design and construction of the facility in order to reduce duplication of cost and effort.

2.4 Video Display

- The subregional TMC shall be sized to accommodate the video wall, associated equipment, clearance required for maintenance, and provide adequate line of sight for all operators to the video wall.
- The subregional TMC video display shall be designed to fit within the spatial requirements and availability of the allotted space for the operations room.

2.5 Construction

- The subregional TMC construction shall be planned and/ or phased to accommodate the continued operational, access, safety, and other related needs of the existing facility in which the TMC will be built without adversely affecting the existing operations and daily activities of that facility.

3.0 SAMPLE SUBREGIONAL TMC SCHEMATIC DIAGRAMS

The physical space requirements for the subregional TMC will vary based on the availability of space at the chosen location. **Figures 3-1, 3-2, and 3-3** depict sample layout drawings of other TMCs in order to demonstrate the wide range of TMC spatial requirements in the industry. It is likely that the Pomona Valley Subregional TMC will require approximately 700 to 1,000 square feet in order to accommodate the level of staffing needed to manage traffic and events in the Pomona Valley Region.

Figure 3-1 shows a draft sample of a potential layout for LA County’s TMC in Alhambra that is currently in the design stage. The figure was developed to depict potential layouts of operator workstations in relation to the video wall labeled as “display wall location.” This layout is one of several developed by Evans, a supplier of operator workstation consoles, for LA County. The figure depicts only the control room portion of the TMC (which represents approximately 2000 of the 8000 square foot facility). In addition to a control room, where the operators and video wall are located, the Pomona Valley subregional TMC will require an equipment and communications room where all of the servers and communications equipment will be located. Additionally, LA County’s TMC shows eight workstations in this figure. While the staffing requirements will not be determined for the Pomona



Valley subregional TMC until Task 10 – Operations and Management Plan, it is likely that only a small portion of this number would be required for the subregional TMC for Pomona Valley.

Figure 3-2 shows a layout of a city TMC for the City of Fontana developed by Iteris. The diagram shows the control room and racks behind the video wall, the total area of which is approximately 600 square feet, with 2 workstations a small video wall and a conference room table and chairs. As described above, the Pomona Valley subregional TMC would also require a computer equipment/communications room. The workstations in this diagram are of a different configuration than those shown in the LA County diagram previously. There are many different options available for operator workstation layouts. **Figure 3-3** depicts a three-dimensional rendering of the control room layout of the Fontana TMC. In lieu of a conference room table and chairs, additional workstations could be accommodated by this room size.

Figure 3-4 shows the layout of the TMC for the Regional Transportation Management Center in the City of San Jose, developed by Kimley-Horn and Associates, Inc. and TMI, Inc. The diagram depicts not only the control room with video wall, but the associated equipment rooms and office and conference room space surrounding the control room. The diagram shows approximately 5400 square feet being used for the TMC. This control room is designed to fit seven operators to cover several functions in Silicon Valley operations and management. A similar smaller sized control room could accommodate three to five operators for the Pomona Valley subregional TMC, or a room of this size might allow collocation with ACE.

Figure 3-5 and 3-6 shows the layouts for the Traffic Management Centers for the Cities of Fremont and Milpitas in the Silicon Valley. The diagrams only show the control rooms and some of the associated equipment space and is each about 300 square feet and could accommodate two operators.

Figure 3-7 is a sample, generic diagram that demonstrates several of the features that would be accommodated by the subregional TMC.

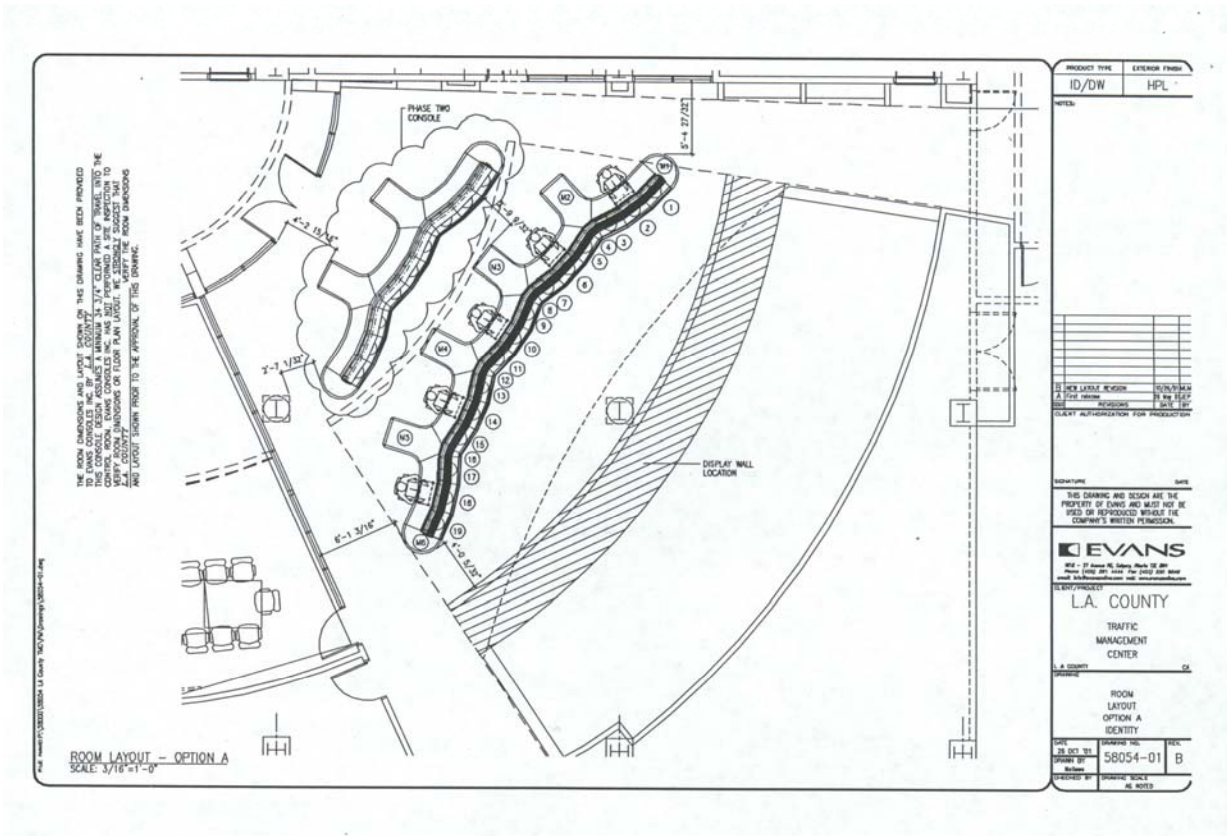


Figure 3-1 Sample LA County TMC Control Room Layout

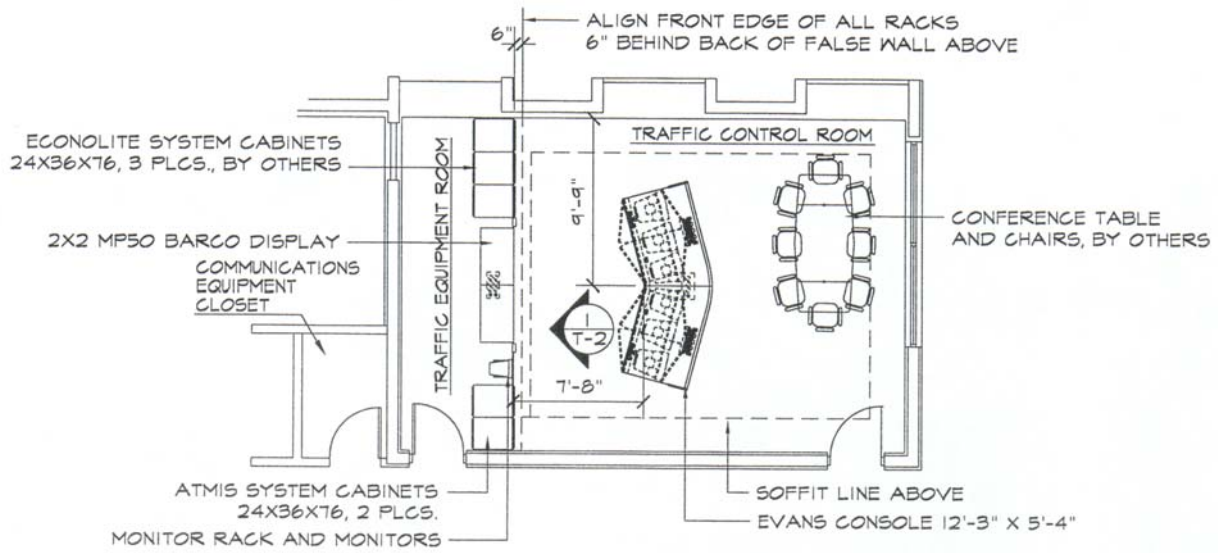


Figure 3-2 Sample City of Fontana TMC Control Room Layout

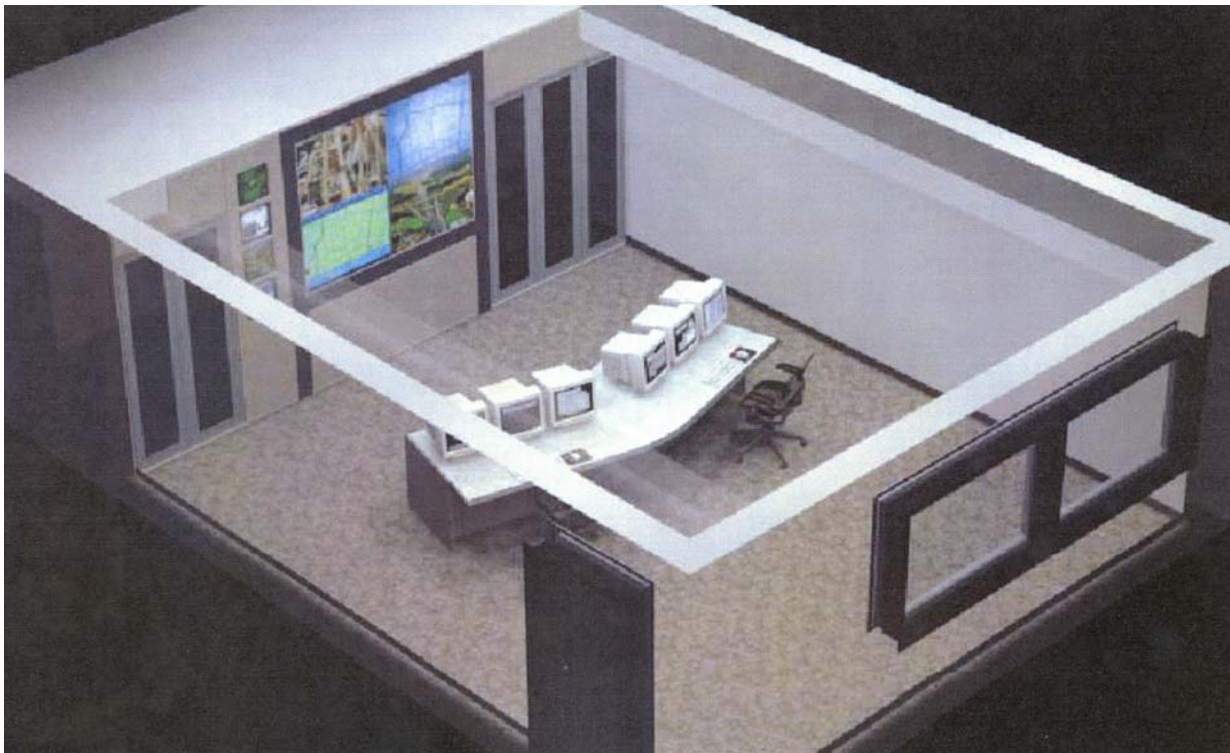


Figure 3-3 Sample City of Fontana TMC Control Room 3-D Layout



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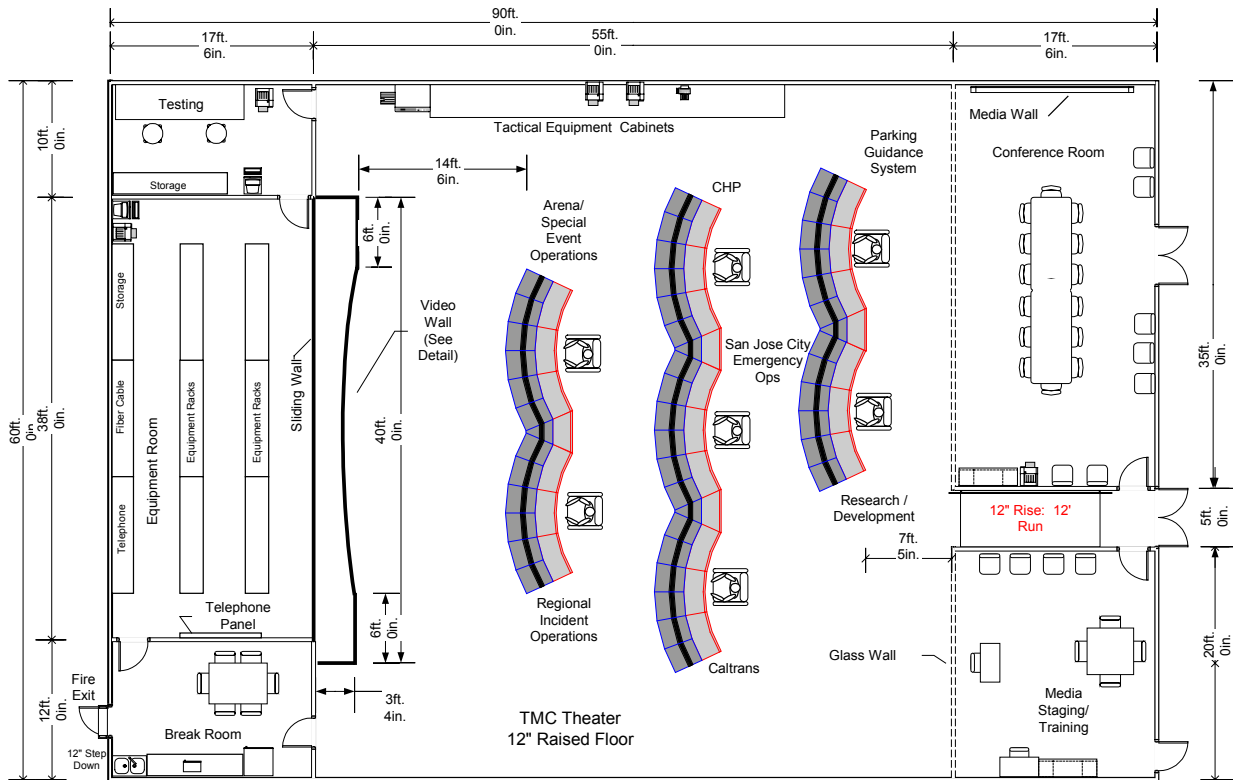
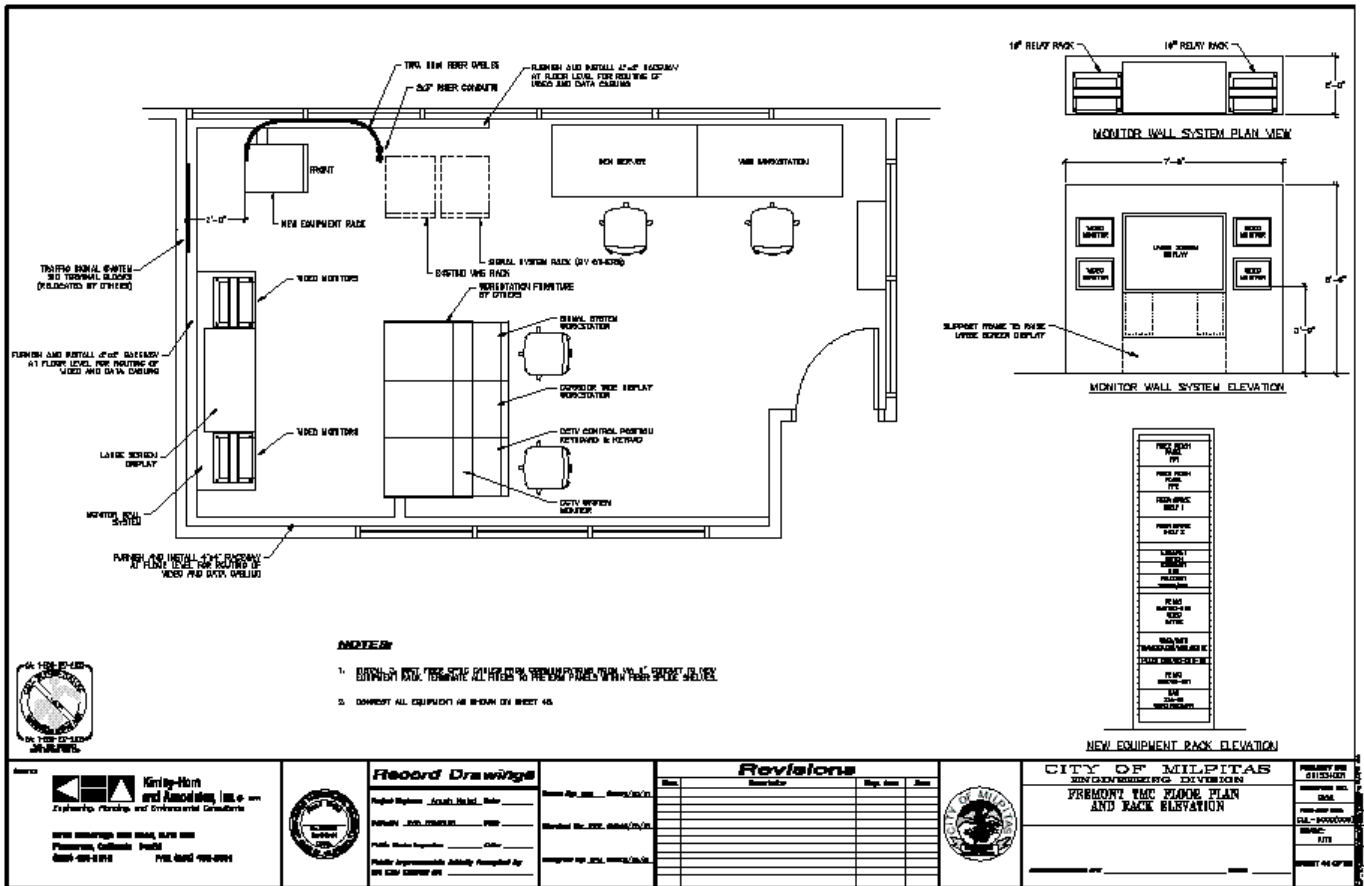


Figure 3-4 Sample City of San Jose TMC Control Room Layout



Figure 3-5 Sample City of Fremont TMC Control Room Layout



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Revisions		
Rev.	By	Date

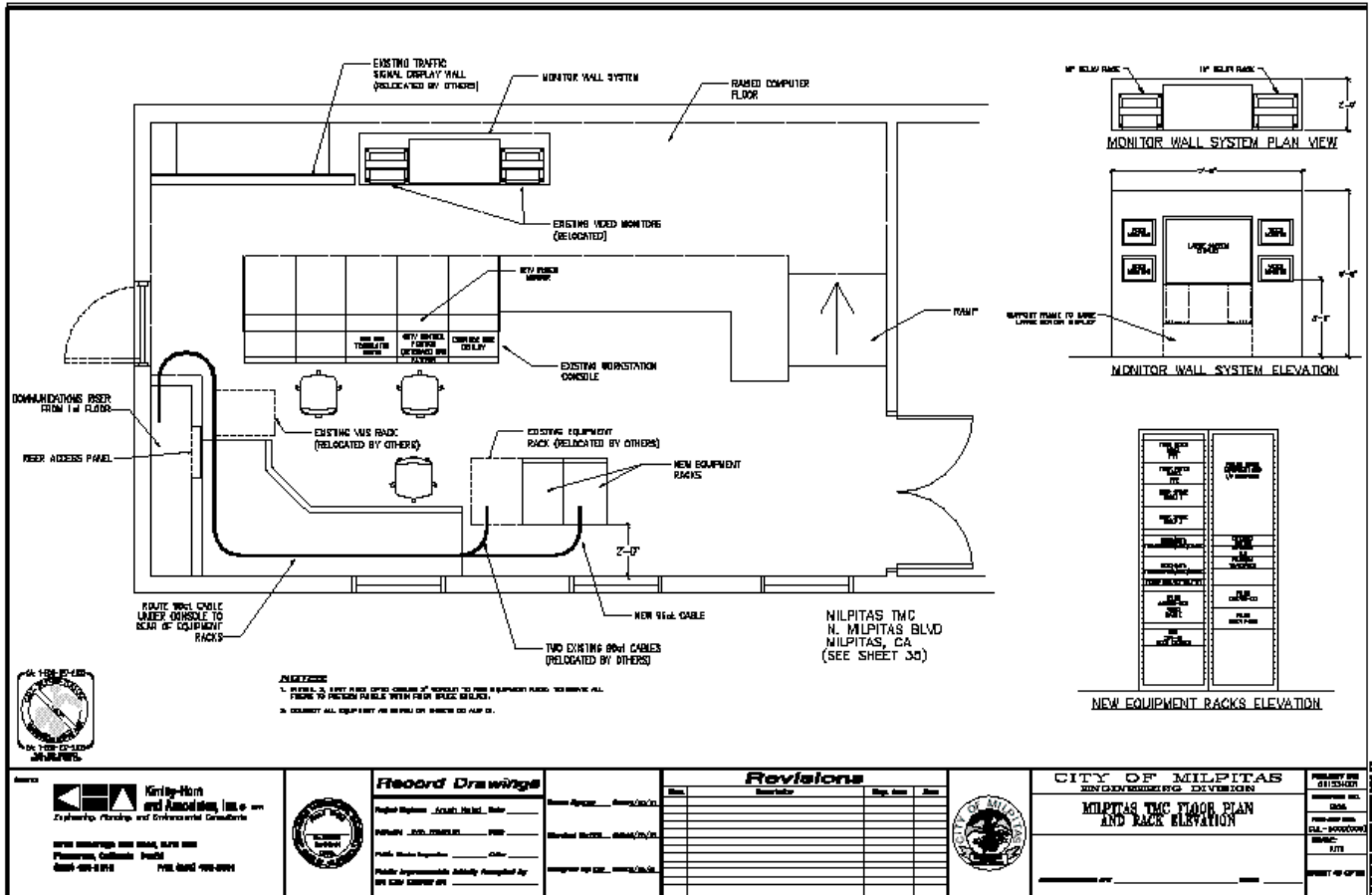
CITY OF MILPITAS
MILPITAS DEPARTMENT OF PUBLIC WORKS

FREMONT TMC FLOOR PLAN AND RACK ELEVATION

PROJECT NO: 099017000
SHEET NO: 02



Figure 3-6 Sample City of Milpitas TMC Control Room Layout



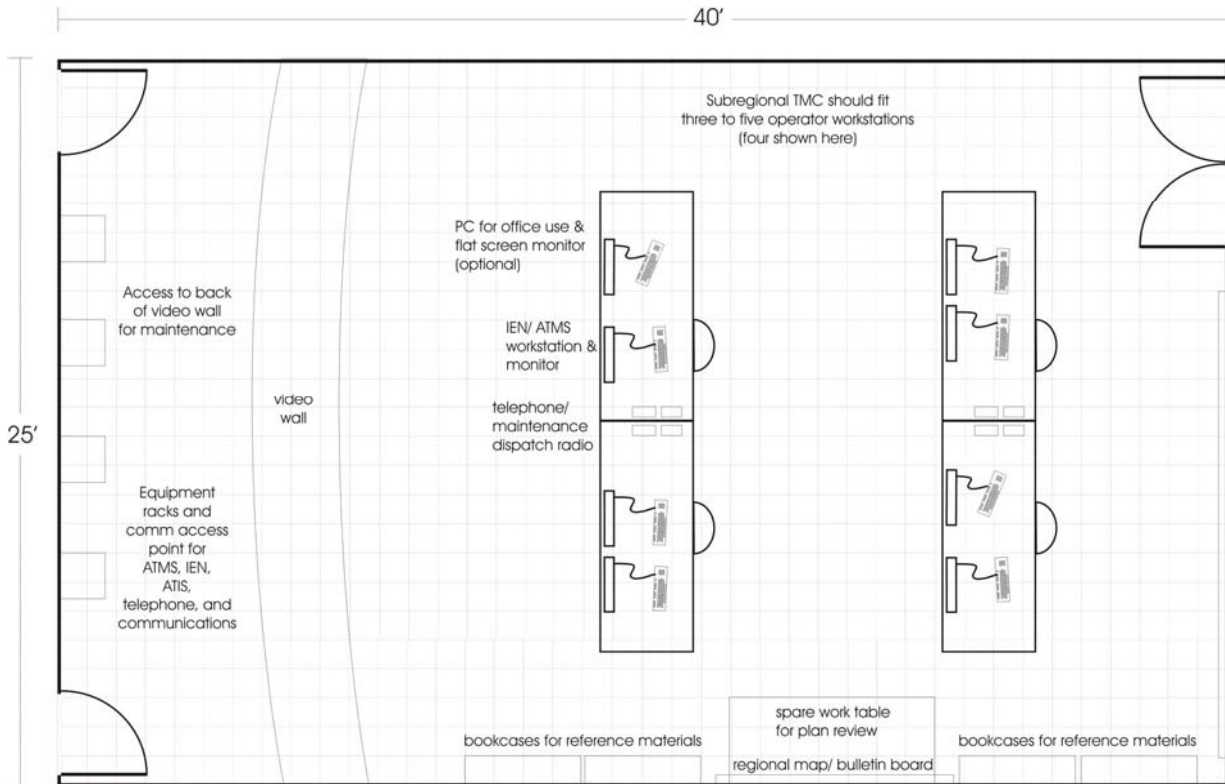


Figure 3-7- Sample Generic Subregional TMC Diagram



List of Acronyms

ACE	Alameda Corridor East Construction Authority
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
Caltrans	California Department of Transportation
CAMS/IEN	Los Angeles County Countywide Arterial Management System/ Information Exchange Network
CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
ITS	Intelligent Transportation System
LA	Los Angeles
LACDPW	Los Angeles County Department of Public Works
LACMTA	Los Angeles County Metropolitan Transportation Authority
LCC	Local Control Center
MOU	Memorandum Of Understanding
NTCIP	National Transportation Communications for ITS Protocol
O&M	Operations and Maintenance
PC	Personal Computer
PTZ	Pan, Tilt and Zoom
PVITS	Pomona Valley Intelligent Transportation System
TMC	Traffic Management Center
TOD	Time-of-Day
UFR	User Functional Requirements
UIR	User Interjurisdictional Requirements
UOR	User Operational Requirements
USR	User Supplementary Requirements
WWV	National Institute of Standards and Technology Time & Frequency shortwave radio station that broadcast accurate real time