



## Pomona Valley ITS Project

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# **Project Deliverable 5.3.4** **Typical Local Control Center Report** **Project Deliverable 6.1.4** **Typical Local Control Center Schematic Diagrams**

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## HISTORY OF REVISIONS

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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 a typical Local Control Center (LCC). This site is the location of the computer systems (ATMS and ATIS) that will enable an agency to monitor and/or control signal operations and congestion in that city or another agency in the Pomona Valley and to share information within the Forum. The LCC will house the following functions. (The system requirements associated with these functions are documented in **Deliverable 5.1.2 – ATMS User Requirements Report, Deliverable 5.2.2 ATMS Functional Requirements Report, Deliverable 5.7.2 – 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)
- Monitoring of and sharing of control of CCTV cameras with other jurisdictions
- Monitoring of and sharing of video images from CCTV cameras and video detection
- Monitoring of and sharing of data from the traffic control system

This document also depicts typical LCC site diagrams.

### 1.2 Methodology

The LCC is the location of the ATMS, IEN workstation, and ATIS interface (through the IEN) for each local agency. The ATMS is intended to monitor and optimize signal operation, enhance vehicular traffic management and operations, reduce congestion levels, and improve incident response and agency coordination. It is also intended to increase the efficiency of operations and maintenance staff through high quality communications and computational tools. In other words, the technologies that will be implemented in the Pomona Valley Forum area are intended to act as tools to assist agencies in managing recurring and non-recurring traffic more efficiently.

As each city has different spatial needs and availability, these requirements are written in terms that will address the individual needs of each agency.

### 1.3 Report Organization

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

Section 1 - Background

Section 2 - Requirements

Section 3 - Typical Local Control Center Diagrams



## 2.0 REQUIREMENTS

The LCC is the location where the management, system access, system monitoring and sharing of information will take place at each city. This would include the exchange of real-time information from the various traffic control systems. The LCC will house the computer hardware and software of the systems. It is envisioned that each agency will have an LCC based on the requirements of that city.

A key component of the architecture for the Pomona Valley is the Information Exchange Network (IEN). The IEN is a countywide communication network that has been designed by LA County as a part of the San Gabriel Valley pilot project. The IEN will act as the primary communication network for exchange of data between systems (center-to-center) and sharing of monitoring and potential sharing of control of field devices. Since the IEN has not been designed to carry video (this functionality may be designed into the IEN in the future) a second communication network is designed into the architecture that will allow the agencies to share video center-to-center.

There are three basic types of systems or levels of control that will be installed in the Forum. These levels were originally defined in the South Bay Forum project currently being administered by the County and are used here to provide consistency Countywide:

- Level 1 – Subregional and local monitoring only, including those agencies that want to relinquish control of their signals
- Level 2 – Subregional and local monitoring and the desire to have control ability with a future traffic control system (to be supplied as a part of this program).
- Level 3 – Subregional and local monitoring and control ability with an existing traffic control system. This also includes those agencies that need to upgrade their existing system. Level 3 is the same functionality as Level 2, but will require on that equipment needed to upgrade the existing system or to support new signals or ITS devices (CCTV cameras, Trailblazers, Arterial-based VMS)

Level 1 - Some agencies will be provided with a monitor-only IEN workstation that provides the agency the ability to view traffic signals and other ITS devices within and outside of the Forum. These IEN workstations would include a basic interface for manual input of some types of traveler information such as construction schedules, road closures, incidents, or special events. These agencies may choose to monitor video as well, but this would require an Internet connection, as the IEN is not currently designed to carry video. Agencies that desire to relinquish control of their signals to another agency (such as to continue their existing agreement with LA County) would also fall under this category. The cities of Industry and Walnut will fall into this category.

Level 2 - Level 2 agencies will be provided an ATMS to monitor and control their traffic signals. In addition, they will be provided an IEN workstation to monitor and control, as allowed, other traffic signals in the subregion, as well as throughout the County. These workstations will also include the ability to monitor and control other ITS devices and would include automated ATIS links to send data from the city's ATMS to the subregional ATIS server. The IEN workstation will also provide the capability to manually input event information to the IEN that would be able to transmit that information to the Subregional ATIS server. All cities, except the City of Pomona, which has an existing traffic control system, and the cities of Industry and Walnut, which are Level 1 cities, will fall into this category. Level 2 Cities may choose to view video on workstations or to install a video wall in



the LCC for viewing. Diamond Bar desires a video wall – all other Pomona Valley Level 2 cities desire to view video on their monitors.

Level 3 – A Level 3 agency currently has an existing traffic control system and is intended to be provided with the same functionality as a Level 2 agency. Most of the Level 3 agencies throughout the County currently have existing resources devoted to the operation of a system. However, some of these agencies currently have an outdated system, or a small, closed loop system. For these agencies, an upgrade of their system will be necessary to provide the functionality required for IEN and ATIS implementation. Additionally, some Level 3 agencies in LA County desire to have a video wall added to their existing LCC (such is the case with Pomona) The only agency that falls into this category is the City of Pomona, which has an existing Quicnet II system.

LA County Department of Public Works is in the process of designing a TMC in Alhambra that will serve as their control center for traffic management of their signals and signals that they operate/maintain under contract for various cities and for monitoring of traffic in each of the five Forums. However, since they don't currently have a system deployed, they are considered a Level 2 agency. One of the local city traffic control sites will also function as the subregional TMC for the Pomona Valley. **Deliverable 5.3.2 – Subregional TMC Requirements** and **Deliverable 6.1.6 – Subregional TMC Schematic Diagrams** describe the subregional TMC requirements and layout options.

The user 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 Space

- The LCC shall be provided to the specific spatial requirements and availability of space for each local agency.
- The LCC shall be developed on a site requiring minimum cost for development.
- The LCC shall be developed on a site requiring minimum cost for communication to field devices.
- The LCC shall be sized to accommodate the City’s operations staff, administrative staff, the computer systems and video display systems.
- It shall employ means to protect from and detect unauthorized access, tampering, and destruction of critical system information and components.

## 2.2 Implementation Costs

- The LCC shall make use of existing infrastructure as much as possible in the implementation of the facility.

## 2.3 Video Display

- The LCC video display shall be designed to fit within the spatial requirements and availability of each individual agency. The display may be one or more of the following:



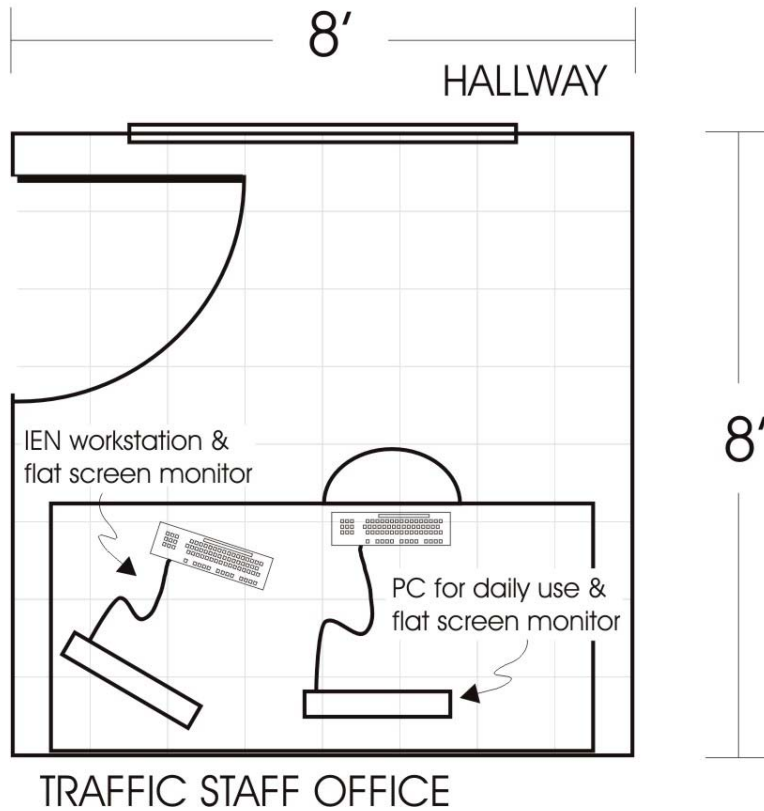
- on a video monitor(s) dedicated for video display in the LCC;
- on a video wall display in the LCC;
- at the ATMS workstation in the LCC; and/or
- at video monitor(s) in the lobby, other offices, and/ or conference rooms within the City.

### 3.0 TYPICAL CITY TRAFFIC CONTROL SITE DIAGRAMS

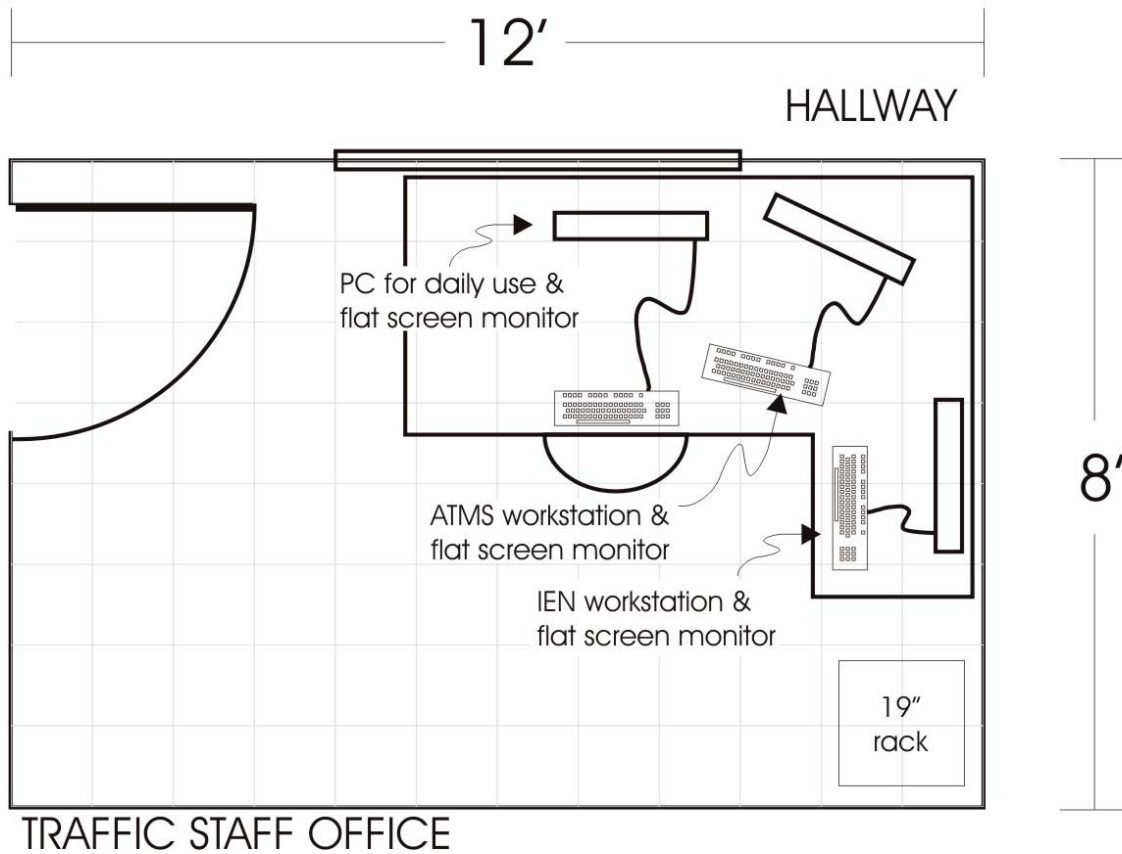
The physical space requirements for the LCC will be different for different agencies, depending upon the requirements of that agency and the availability of space. Though the spatial requirements will vary from city to city, based on the field elements to be controlled from that LCC, an average city will likely require space for two 19-inch racks to hold the servers for the signal control and communications, IEN workstation and associated communications equipment. A city with many cameras will require additional space for communication equipment and cabling. **Figures 3-1, 3-2, and 3-3** depict typical layout drawings of the LCC.

- Typical Layout A represents a Level 1 city whose signals are being controlled by another agency (through a previously agreed to contract). This city would only need to provide a PC for daily activities and video monitoring and a project provided IEN workstation for monitoring/ controlling field elements in their own jurisdiction or anywhere else in the Forum or county. This city would need very little space for communication equipment, and it would likely be in another location outside of the traffic staff office.
- Typical Layout B represents a Level 2 or Level 3 city. The agency’s equipment includes a signal system, but few to no CCTV cameras or other field devices. In addition, three workstations are anticipated to be in the LCC: one for the IEN, one for the ATMS provided by the project and one PC provided by the city for daily activities. One rack would likely be sufficient to house the signal and communication equipment. In this example, the agency has limited space or no desire to have a video wall installed in their agency (though Level 2 and Level 3 cities may choose to have video walls in their LCCs – an example of an LCC with a video wall is provided in Typical Layout C below).
- Typical Layout C represents a Level 2 or Level 3 city with a signal system (ATMS), multiple CCTV cameras in the field, and perhaps a dynamic message sign and/or a series of Trailblazers. In this scenario, an ATMS workstation would be needed to operate the city’s signals and field elements; an IEN workstation would be needed to monitor/ control (as agreed upon by other agencies) signals, traffic, and field elements in other agencies within and outside of the Forum; and a city provided PC for daily office activities would be needed. In this example, the City has chosen to supplement video viewing on the PC and ATMS workstations with a small video wall consisting of 2 or 3 monitors.





**Figure 3-1: Typical Layout A**



**Figure 3-2: Typical Layout B**

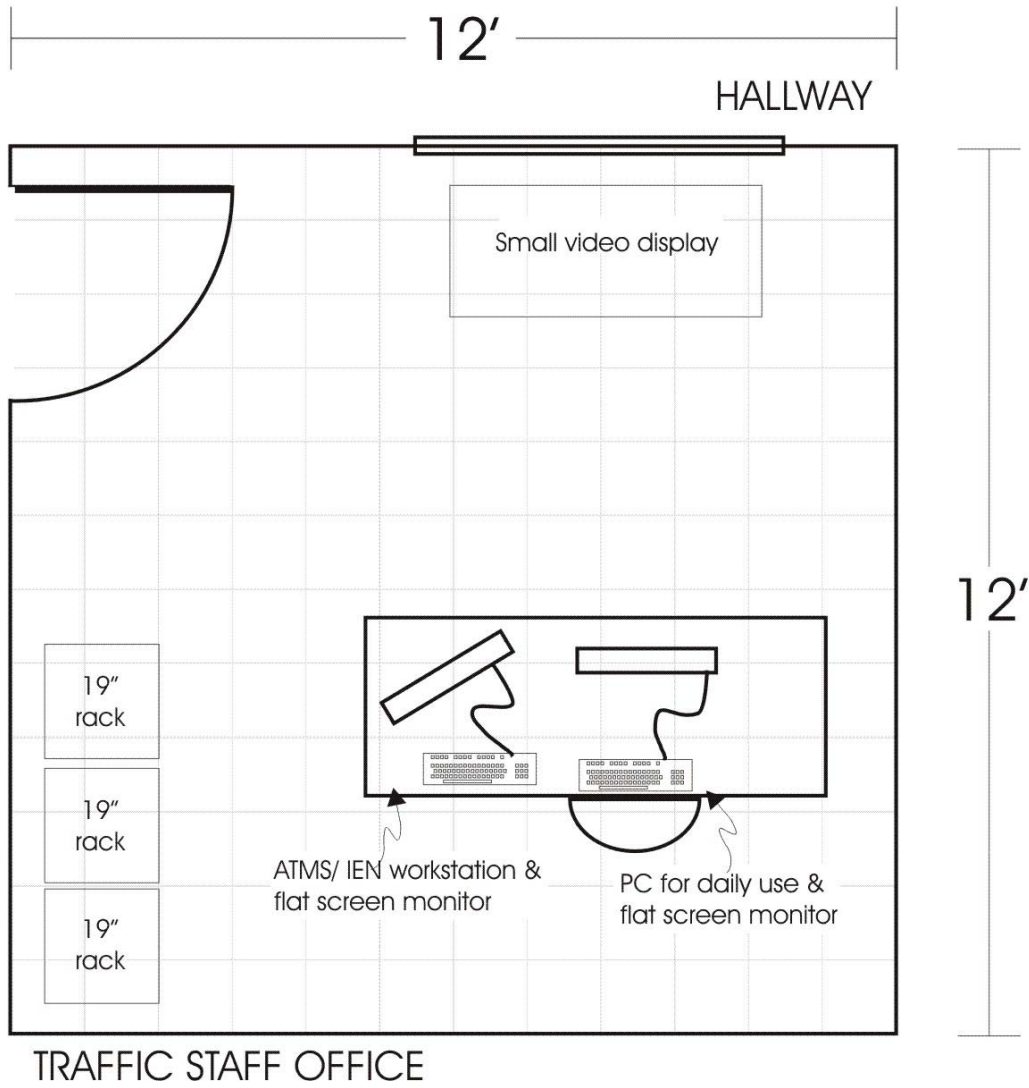


Figure 3-3: Typical Layout C



## LIST OF ACRONYMS

|                 |  |
|-----------------|--|
| <b>ACE</b>      | Alameda Corridor East Construction Authority   |
| <b>ATIS</b>     | Advanced Traveler Information System   |
| <b>ATMS</b>     | Advanced Traffic Management System   |
| <b>Caltrans</b> | California Department of Transportation  |
| <b>CAMS/IEN</b> | Los Angeles County Countywide Arterial Management System/ Information Exchange Network |
| <b>CCTV</b>     | Closed Circuit Television  |
| <b>ITS</b>      | Intelligent Transportation System(s)   |
| <b>LA</b>       | Los Angeles  |
| <b>LACDPW</b>   | Los Angeles County Department of Public Works  |
| <b>LACMTA</b>   | Los Angeles County Metropolitan Transportation Authority                               |
| <b>LCC</b>      | Local Control Center   |
| <b>NTCIP</b>    | National Transportation Communications for ITS Protocol                                |
| <b>O&amp;M</b>  | Operations and Maintenance   |
| <b>PVITS</b>    | Pomona Valley Intelligent Transportation System  |
| <b>TMC</b>      | Traffic Management Center  |