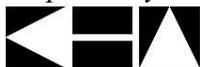




Pomona Valley ITS Project

Project Deliverable 13.1.2 Final Conceptual Design Report

Prepared by:



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and Associates, Inc.



October 20, 2006
099017000.1

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HISTORY OF REVISIONS

Version	Date
	08/29/03
	01/19/04
	03/16/05
	11/16/05
	01/25/06
	10/20/06

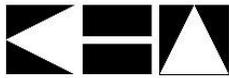
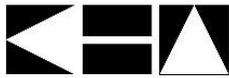


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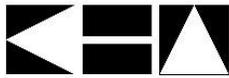
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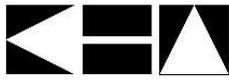
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1.0 INTRODUCTION

1.1 Program Background

The County of Los Angeles, in cooperation with the cities within the Pomona Valley, has determined that development of an arterial-based Advanced Transportation Management System (ATMS) and 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) program was conceived as a recommendation from the Pomona Valley ITS Feasibility Study completed by the Los Angeles County Metropolitan Transportation Authority (LACMTA) in 1995. The ultimate objectives of the program are to:

- Improve mobility by optimizing traffic management on arterials and freeways;
- Enhance State Route 60 capacity by 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.

Figure 1 depicts the study area.



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- - - COUNTY LIMITS
- ⋯ CITY LIMITS

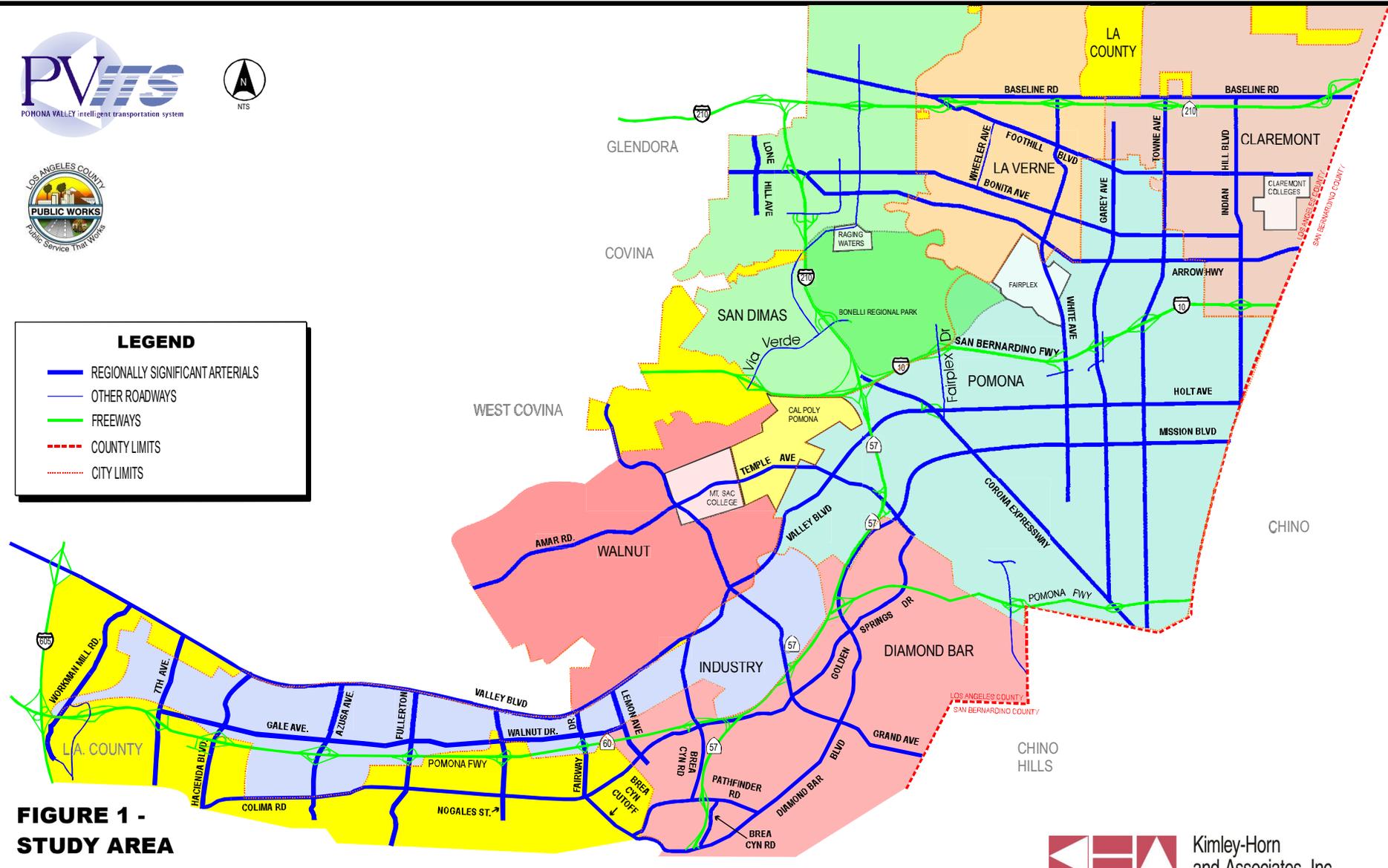
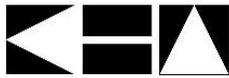


FIGURE 1 - STUDY AREA



1.2 Purpose of Report

The purpose of this report is to summarize the recommended conceptual design for the PVITS program in a format that can be used as the foundation to complete the detailed design of the program. Another purpose of this report is to seek concurrence and approval for these recommendations. Detailed analyses conducted during this project have been documented in numerous reports that were previously completed. The details of these analyses and the methodology and criteria that led to the final concept design can be found in the following reports:

- *ATMS Alternative Analysis Report* (Deliverable 7.1.2);
- *ATIS Analysis Report* (Deliverable 7.4.2);
- *Communication System Alternative Analysis Report* (Deliverable 7.2.2);
- *Subregional TMC Analysis Report* (Deliverable 7.3.2);
- *Final Local City Control Site Analysis Report* (Deliverable 7.5.2); and
- *Recommendation Report* (Deliverable 8.1.2).

In addition to the technical analysis and recommendation reports listed above, numerous other reports that have been produced in the course of the Conceptual Design of this program, together form the full Conceptual Design.

1.3 Report Organization

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

Section 1 – Introduction

Section 2 – Program Summary

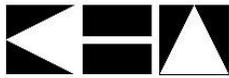
Section 3 – Conceptual Design

Section 4 – Individual Agency Summaries

Section 5 – Preliminary Opinions of Cost

Appendix A – List of Acronyms

Appendix B – CCTV Evaluation



2.0 PROGRAM SUMMARY

2.1 Overview

The ATMS/ITS program for the Pomona Valley subregion of Los Angeles County has been prioritized into a phased implementation program of several key ATMS and ITS components with the objective of easing congestion and improving the tools available to the local agencies involved in traffic management in the region. Only the ATMS and ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. The major components of the program are briefly summarized here. Further detail is provided in the subsequent sections of this report.

ATMS – to establish the capability for traffic signals on regionally significant arterials to be remotely operated and monitored by responsible local agencies within the region. An ATMS is a software package that provides these capabilities to agency staff.

Agency Integration – to connect each agency to Los Angeles County’s Information Exchange Network (IEN) for data sharing, monitoring of other agency’s traffic signals and improving the ability of local agencies to coordinate their daily traffic management and occasional incident/event management activities.

Advanced ITS Components – the added capabilities of visually monitoring current traffic conditions during congestion and providing travelers with current traffic condition information. Installation of closed-circuit television (CCTV) cameras and changeable message signs are recommended to comprise this component of the program.

Communications – the infrastructure required for all of these components to work effectively is the communication network. The communications for this program will be accomplished primarily through existing interconnect and new leased connections. A small segment of new interconnect is proposed to be constructed.

Control Centers – Each city has identified a location for a LCC to be established within currently available office space from which the local traffic can be managed utilizing these tools. A subregional TMC is proposed to be located at the City of Diamond Bar to act as their LCC and additionally house any equipment that is required to serve the whole subregion, such as the IEN corridor server required for agency integration.

2.2 Area ITS Architecture

The area architecture defines how the systems and agencies will interact to better manage traffic in the Pomona Valley region through this ATMS/ITS program. A separate report, *Deliverable 6.1.2 – Area Architecture and Concept of Operations*, documents the details of the architecture and describes the concept of operations for three different levels, or types, of traffic management agencies in the area. **Figure 2** summarizes the architecture for the Pomona Valley ATMS/ITS program.

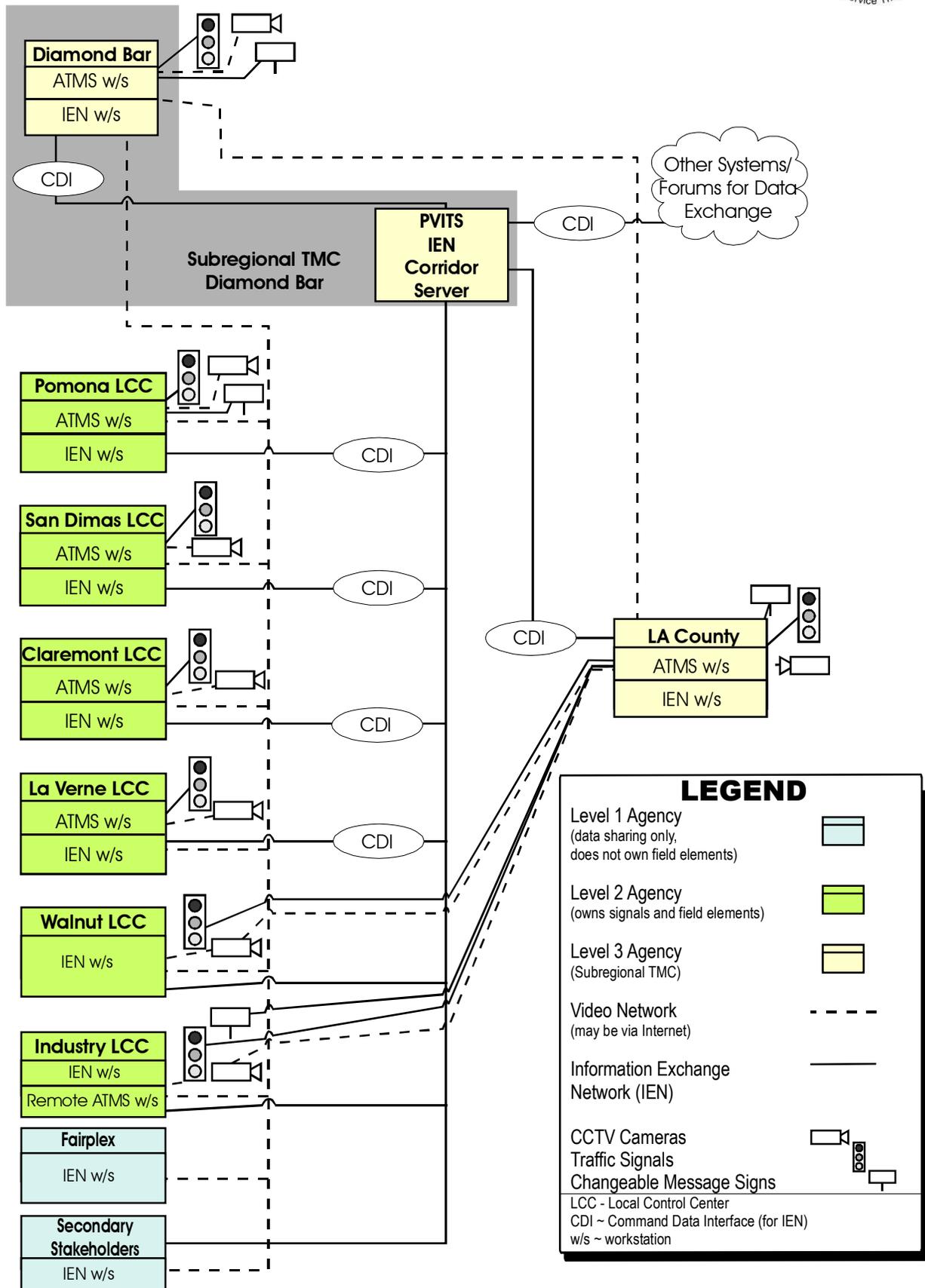
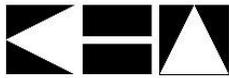


FIGURE 2 - AREA ITS ARCHITECTURE





3.0 CONCEPTUAL DESIGN

3.1 Advanced Traffic Management System (ATMS)

3.1.1 Background

An ATMS is a system that can provide an agency with tools for managing traffic including the capability to remotely monitor and operate traffic signals, collect and process data from vehicle detectors, operate and view closed-circuit television CCTV cameras (if desired), operate dynamic message signs (DMS) [including Trailblazers, which are low-cost, changeable signs specifically designed for wayfinding] (if desired), and share data with other systems and other stakeholders.

With the exception of Pomona, none of the local agencies within the Pomona Valley have existing, operational traffic control systems. The City of Pomona previously operated QuicNet II and has recently received QuicNet IV as a part of the Alameda Corridor East (ACE) Intelligent Roadway/Rail Interface System (IR/RIS) demonstration project to monitor and control a grid of 32 traffic signals as a part of this demonstration project.

Two analyses were completed in *Deliverable 7.1.2 – ATMS Alternative Analysis Report*. The first was an alternative analysis to recommend an appropriate architecture for the implementation of the ATMS in terms of which agencies will own and maintain their own systems and which will share. The second was a technology analysis that compared numerous commercial-off-the-shelf software packages that could provide the desired functionality for each agency.

The technology analysis compared functional requirements against currently available commercial-off-the-shelf ATMS packages. Bitran's QuicNet/4, Kimley-Horn's KITS, and Gardner's i2TMS were recommended as options for deployment in the Pomona Valley Region.

3.1.2 ATMS Concept

Two of the local agencies within the Pomona Valley, Industry and Walnut, currently contract traffic signal maintenance to Los Angeles County DPW. Those agencies will expand their contracts to include operations in addition to maintenance at an additional cost per traffic signal. Los Angeles County recently selected an ATMS for purchase to manage their own traffic signals county-wide. The County is currently installing this system. The system, KITS, will be utilized for monitoring and operation of traffic signals belonging to Industry, Walnut, and Los Angeles County that are within the study area.

A separate ATMS is proposed to be deployed at each of the other agencies in the subregion. Connection of each system to the IEN Corridor Server located at the subregional TMC in Diamond Bar will allow each agency to share data and to monitor traffic signals and other ITS field elements anywhere in the subregion or county-wide. The IEN connections also provide the capability to share control of devices in the future, if desired by each agency.

The City of Pomona is proposed to expand their QuicNet IV system, which currently operates 32 traffic signals in the Alameda Corridor East demonstration project corridor, to connect to the remaining traffic signals that are on regionally significant arterials in the City.



It is proposed that Claremont, San Dimas, La Verne, and Diamond Bar will each select a system from the recommended short-list for installation in their city. As each of the recommended systems meets the functional requirements of the agencies, selection will be based primarily on agency staff preference.

Figure 3 depicts the proposed detailed architecture for the recommended ATMS and IEN connections in the Pomona Valley region. The traffic signals owned by Los Angeles County (within the Pomona Valley study area), Industry, and Walnut are proposed to connect to the new Los Angeles County TMC in Alhambra. The location of communication hub and specific network configuration will be determined by SBC Communications when the leased lines are ordered. Each of the other agencies' traffic signals is proposed to connect directly to equipment at the corresponding agency (see **Section 4** for a list of equipment to be located at each LCC/TMC). Separate leased connections from each agency in the study area (Claremont, La Verne, Pomona, Industry, San Dimas, and Walnut) to Diamond Bar are proposed that will complete the Pomona Valley portion of the county-wide IEN allowing monitoring by each agency of other agency's traffic signals.

LEGEND

- Level 1 Location
(data sharing only, does not own field elements) [Light Blue Box]
- Level 2 Location
(owns signals and field elements) [Light Green Box]
- Level 3 Location
(Subregional TMC) [Light Yellow Box]
- Direct signal-to-ATMS communication [Solid Line]
- Information Exchange Network (IEN) communication [Dashed Line]
- Traffic Signals [Traffic Signal Icon]

LCC - Local Control Center
 IEN - Information Exchange Network
 ATMS - Advanced Traffic Management System (central software that monitors and controls signals)

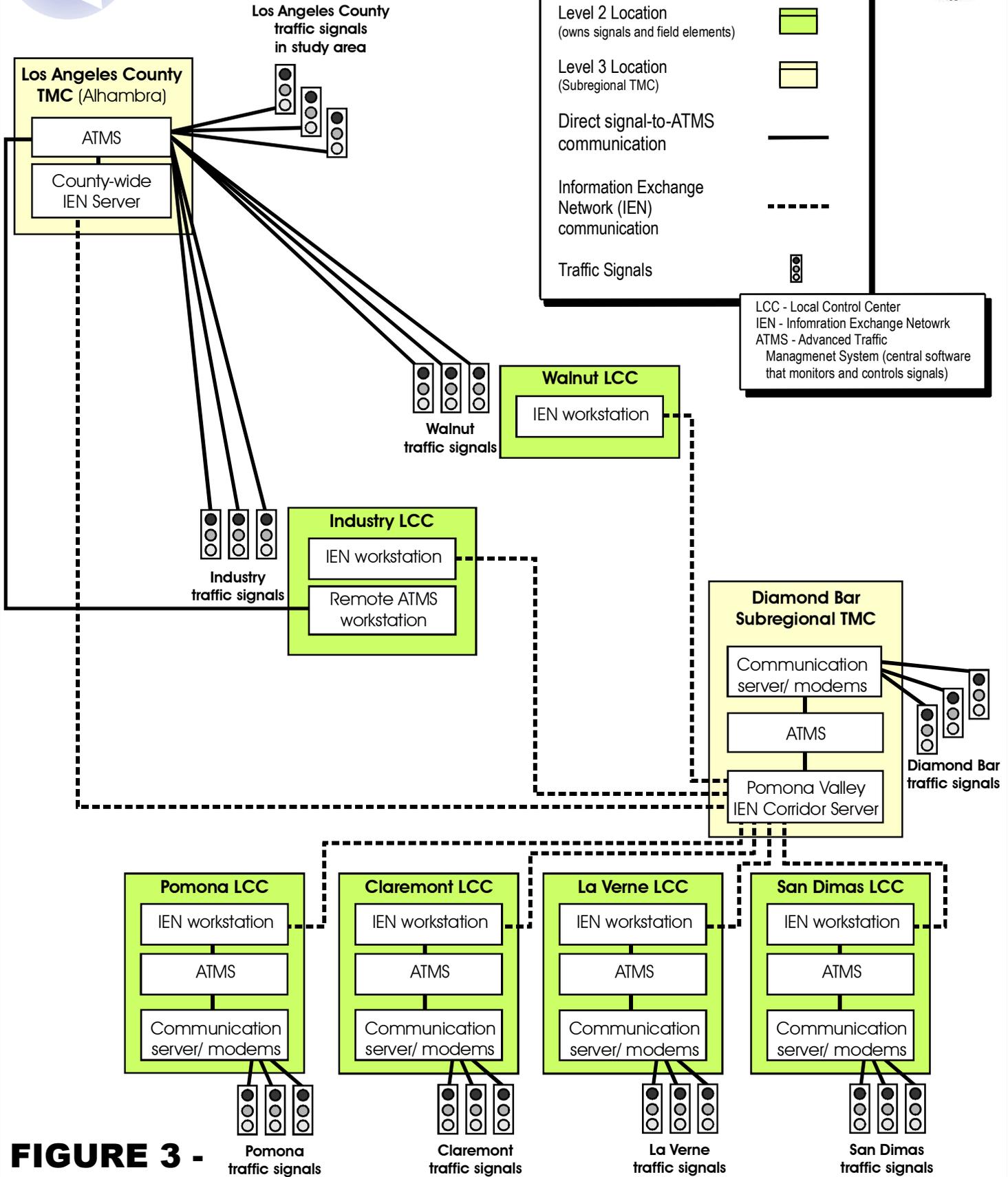


FIGURE 3 -

DETAILED ATMS/IEN ARCHITECTURE





3.2 Agency Integration

The installation of an IEN corridor server for the Pomona Valley would 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 Los Angeles. This server is a part of a county-wide network (the IEN) 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' systems within Los Angeles County regardless of the type of system. Each Forum, or subregion, of Los Angeles County is proposed to have its own IEN corridor server that will enable the communication to occur within that Forum and from that Forum to other Forums/agencies within the County.

The Pomona Valley IEN Corridor Server is proposed to reside at the Subregional TMC in Diamond Bar. The center-to-center communication network to support the IEN in the Pomona Valley is proposed to be developed with leased services; each agency is proposed to lease a T1 (1.544 Mbps)¹ connection to the City of Diamond Bar to establish this communication as depicted in the previous figure.

3.3 Advanced ITS Elements

3.3.1 Closed-Circuit Television Cameras

CCTV cameras are proposed to be used by agencies in the Pomona Valley to supplement the automated features of the ATMS by viewing first hand the transportation network operations and the impacts of various management strategies and timing plan changes. CCTV cameras can also assist with congestion-related studies, and increase information sharing with the public and the media.

Digital CCTV transmission technology is proposed to be used in the Pomona Valley area. The recommended locations for the CCTV cameras are shown in **Figure 4**. Locations for CCTV cameras were recommended and prioritized based on input from agencies as to where video coverage would be useful toward arterial traffic management and an analysis of the intersections that included intersection volumes and accident history as criteria for prioritization. Several Caltrans intersections were considered in the evaluation in order for local agencies to be able to monitor traffic conditions affecting regional traffic. CCTV cameras monitoring Caltrans intersections (provided by this project) would be installed outside of Caltrans' right-of-way. Intersection volumes were ranked based on estimated total approach average daily traffic volumes. Volumes were compiled from a variety of sources as noted in the earlier deliverables. Accident history was ranked based on quantity of collisions in a recent one year period (most collision histories were compiled for the most complete data set available at the outset of the analysis which was 2003; select locations utilized 2004 data were data was provided by the local agency). A summary of the rankings used for volumes and accident data is shown in the following two tables. Based on this analysis, locations were prioritized and the resulting phasing is also depicted in the figure.

¹ A minimum 384 kbps communication line is needed for IEN connections. The lowest bandwidth line that SBC Communications offers under the contract with the County that meets this criteria is 1.544 Mbps.



ADT Approach Volumes

0	less than	40000
1	40000	55000
3	55001	70000
5	Greater than	70000

Annual Collision History

0		0
1	1	5
2	6	10
3	11	15
4	16	20
5	Greater than	20

Additionally, several agencies have requested additional CCTV cameras be purchased and installed at that city’s expense. A total of nine cameras will be funded by the existing funding for the Pomona Valley ITS program, and an additional seven are being funded by partner agencies.

The full CCTV evaluation table is provided in **Appendix B** for reference. **Table 1** summarizes the list of locations for each proposed CCTV camera along with proposed phasing.

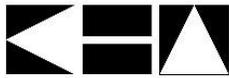
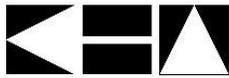


Table 1 – Proposed CCTV Camera Locations and Deployment Phases

Signalized Intersection	Ownership	Location	Construction Phase
Nogales Street / Colima Road	LA County	LA County	1
Golden Springs Drive / Grand Avenue	Diamond Bar	Diamond Bar	1
Grand Avenue / Diamond Bar Blvd.	Diamond Bar	Diamond Bar	1
Hacienda Boulevard / Gale Avenue	LA County	LA County	1
Azusa Avenue / Gale Avenue	Industry	Industry	1
Fullerton Road / Colima Road	LA County	LA County	1
Nogales Street / Gale Avenue / Walnut Drive	Industry / LA County	LA County	1
Colima Road / Azusa Avenue	Industry / LA County	Industry	1
Diamond Bar Blvd. / Golden Springs Drive	Diamond Bar	Diamond Bar	1
Indian Hill Blvd./ San Jose	Caltrans	Claremont	1
Arrow Hwy / White Ave.	La Verne	La Verne	1
Diamond Bar Blvd. / Pathfinder Road	Diamond Bar	Diamond Bar	1
Arrow Highway / Bonita Avenue / SR 57 NB ramps	San Dimas	San Dimas	1
Brea Canyon Road / Golden Springs Drive	Diamond Bar	Diamond Bar	1
Gale Avenue / Fullerton Road	Industry	Industry	1
Golden Springs Drive / Lemon Avenue	Diamond Bar	Diamond Bar	1
Valley Blvd @ Temple/I-605 ramps	LA County	LA County	3
Amar Road/ Grand Avenue/ Temple Avenue	Walnut	Walnut	3
Gale Avenue / Seventh Street	Industry	Industry	3
Valley Boulevard / Hacienda Boulevard	Industry	Industry	3
Valley Boulevard / Workman Mill Road/Puente Ave	Industry / LA County	LA County	3
Hacienda Boulevard/ Colima Road	LA County	LA County	3
Valley Blvd @ Sunset/7th Avenue	LA County	LA County	3
Arrow/E St/Fairplex Drive	Pomona	Pomona	3
Colima Road/ Stoner Creek Road	Industry / LA County	LA County	3
Valley Boulevard / Fullerton Road	Industry / LA County	LA County	4
Arrow Highway / Lone Hill Avenue	San Dimas	San Dimas	4
Foothill Boulevard / San Dimas Avenue	San Dimas	San Dimas	4
Foothill Blvd. / Indian Hill Blvd.	Caltrans	Claremont	4
Pathfinder Road / Brea Canyon Rd. / Fern Hollow	Diamond Bar	Diamond Bar	4
Valley Boulevard / Fairway Drive	Industry / Walnut	Industry	4
Holt Avenue / Indian Hill Blvd.	Pomona	Pomona	4
Hacienda Boulevard/ Haliburton Road	LA County	LA County	4
Colima Road/ Haliburton Road	LA County	LA County	4
Temple Avenue / Valley Blvd.	Pomona	Pomona	4



Arrow Highway / Indian Hill Blvd.	Claremont	Claremont	4
Colima Road / Brea Canyon Cutoff / Fairway Drive	LA County	LA County	4
Foothill Blvd./ Wheeler Avenue	Caltrans	La Verne	4
Amar Road @ Nogales St	LA County	LA County	4
Valley Blvd / Grand Avenue	Industry / LA County	LA County	5
Indian Hill Blvd./ Bonita Avenue	Claremont	Claremont	5
Brea Canyon Road / Diamond Bar Blvd.	Diamond Bar	Diamond Bar	5
Mission Blvd. / White Avenue	Pomona	Pomona	5
Baseline Road/ Fruit Street	La Verne – Future Signal	La Verne	5
Mission Blvd. / Towne Avenue	Pomona	Pomona	5
Arrow Highway / San Dimas Avenue	San Dimas	San Dimas	5
Valley Boulevard / Azusa Way	Industry / La Puente	Industry	5
Foothill Blvd./ White Ave./ Fruit St.	Caltrans	La Verne	5
Valley Blvd @ Brea Canyon Road	LA County	LA County	5
White Avenue / McKinley Avenue	Pomona	Pomona	5
Fairway Drive/ Walnut Drive	Industry / LA County	LA County	5
Mission Blvd. / Temple Avenue	Pomona / Diamond Bar	Pomona	5
Fairplex Drive/ W.McKinley Avenue	Pomona	Pomona	5
Via Verde/ San Dimas Avenue	San Dimas	San Dimas	5
Baseline Road / Indian Hill Blvd.	Caltrans	Claremont	5
Baseline Road / Mills Avenue	Caltrans	Claremont	5
White Avenue at The Fairplex (Gate 17)	Pomona	Pomona	5

TOTALS:

PHASE 1	16
PHASE 3	9
PHASE 4	14
PHASE 5	18



3.3.2 *Dynamic Message Signs*

Based on input from member agencies and Los Angeles County DPW, it was determined that DMS and Trailblazers would be implemented only on a limited basis in the Pomona Valley subregion. This design philosophy was based on the anticipated public opinion of such signage along with the cost of the signs, and the overall cost/benefit to be expected from deployment of this type of technology on arterials. The primary objective of the Pomona Valley program is to improve signal operations within the region. The DMS/Trailblazer aspect of the program is secondary and would require increased participation from the agencies where the proposed DMS/Trailblazers are to be located. The increased participation is envisioned to include interest in identifying operational procedures, implementation of the procedures, identifying staff to take on such responsibilities, and making equipment available for implementation.

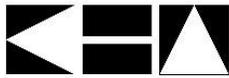
DMS are proposed to be implemented in strategic locations to provide information to drivers en-route to the Fairplex on the arterial network. This information would assist drivers in choosing the best route based on guidance from local traffic management staff. Staff would be able to control the DMS from an on-site workstation at the Fairplex or from their LCCs.

The primary issue in the Route 60 corridor is congestion – both recurring and non-recurring. With three viable, alternate routes in close proximity to SR 60, this corridor is a prime candidate for managing traffic by balancing the demand for available capacity on all four routes simultaneously. This means that if SR-60 is congested due to an incident or regular peak period congestion and one or more of the alternates have available capacity, demand can be shifted from the congested artery to a less congested one. This concept of corridor management does not require that specific direction be given to individual drivers to take an alternate route. The concept of corridor management involves encouragement of natural diversion through the use of dynamic, real-time signage to provide information to travelers.

Trailblazer signs, which are smaller DMS that are tailored specifically to route guidance, are being recommended on the three primary alternative routes to SR-60 in the southwestern portion of the subregion in addition to several that serve traffic approaching the Fairplex. Trailblazers are recommended for these locations as a lower cost solution (than DMS). This low-cost solution can assist in managing the flow especially during recurring and non-recurring congestion, in concert with an advanced traffic management system.

Deployment of recommended signing was phased based on the importance of signing to the overall program as compared to other solutions (such as establishing baseline communications with traffic signals), sequencing of projects needed for the signs to achieve full effectiveness (such as the purchase and installation of the advanced traffic signal systems), the projected effectiveness of this solution, and the availability of program budget for this type of solution. A full analysis of the traffic and issues related to the Fairplex was conducted as a part of this project and phasing for deployment of the recommended solutions was determined in that analysis. The remainder of the recommended signs, which consists of the Trailblazers recommended for deployment in the SR-60 corridor, was recommended for deployment in Phase 3.

Lane control signals were recommended for the Fairplex area in order to assist with traffic control. These signals are recommended for future phases as funding permits.



The recommended locations of the DMS, Trailblazer signs, and Lane Control signals, along with suggested implementation phasing, are identified in **Figure 5**. **Table 2** summarizes the list of locations for each proposed sign/signal along with the proposed phasing.

Table 2 – Proposed DMS and Trailblazer Signs Locations and Deployment Phases

Field Equipment	Signalized Intersection and Sign Location	Ownership	Location	Deployment Phase
Trailblazer (for SR 60)	Gale Avenue/Azusa Avenue: <ul style="list-style-type: none"> ▪ NB Azusa Avenue south of Gale Avenue ▪ EB Gale Avenue west of Azusa Avenue ▪ WB Gale Avenue east of Azusa Avenue 	Industry	Industry	3
Trailblazer (for SR 60)	Gale Avenue/Fullerton Road: <ul style="list-style-type: none"> ▪ NB Fullerton Road south of Gale Avenue ▪ EB Gale Avenue west of Fullerton Road ▪ WB Gale Avenue east of Fullerton Road 	Industry	Industry	3
Trailblazer (for SR 60)	Gale Avenue/Walnut Avenue/Nogales Street: <ul style="list-style-type: none"> ▪ NB Nogales Street south of Gale Avenue ▪ EB Gale Avenue west of Nogales Street ▪ WB Gale Avenue east of Nogales Street 	Industry	Industry	3
Trailblazer (for SR 60)	Walnut Avenue/Fairway Drive: <ul style="list-style-type: none"> ▪ NB Fairway Drive south of Walnut Avenue ▪ EB Walnut Avenue west of Azusa Avenue 	Industry	Industry	3
Trailblazer (for SR 60)	Azusa Avenue/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Azusa Avenue ▪ WB Colima Road east of Azusa Avenue ▪ SB Azusa Avenue north of Colima Road 	Industry/LA County	LA County	3
Trailblazer (for SR 60)	Fullerton Road/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Fullerton Road ▪ WB Colima Road east of Fullerton Road ▪ SB Fullerton Road north of Colima Road 	LA County	LA County	3
Trailblazer (for SR 60)	Nogales Street/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Nogales Street ▪ WB Colima Road east of Nogales Street ▪ SB Nogales Street north of Colima Road 	LA County	LA County	3
Trailblazer (for SR 60)	Colima Road/Brea Canyon Cutoff/Fairway Drive: <ul style="list-style-type: none"> ▪ EB Colima Road west of Fairway Drive ▪ SB Fairway Drive north of Colima Road 	LA County	LA County	3
DMS (for Fairplex)	Fairplex Drive North of I-10 ramps	Pomona	Pomona	3
Trailblazer (for Fairplex)	White Avenue/McKinley Avenue: <ul style="list-style-type: none"> ▪ NB White Avenue south of McKinley Avenue ▪ WB McKinley Avenue east of White Avenue ▪ SB White Avenue north of McKinley Avenue 	Pomona	Pomona	3
Trailblazer (for Fairplex)	La Verne Avenue/White Avenue: <ul style="list-style-type: none"> ▪ NB White Avenue south of La Verne Avenue ▪ SB White Avenue north of La Verne Avenue ▪ EB La Verne Avenue west of White Avenue ▪ WB La Verne Avenue east of White Avenue 	Pomona	Pomona	3



Field Equipment	Signalized Intersection and Sign Location	Ownership	Location	Deployment Phase
Trailblazer (for Fairplex)	Fairplex Drive/McKinley Avenue: <ul style="list-style-type: none"> ▪ NB Fairplex Drive south of McKinley Avenue ▪ EB McKinley Avenue west of Fairplex Drive 	Pomona	Pomona	3
Lane Control Signals (for Fairplex)	NB White Avenue between McKinley Avenue and La Verne Avenue	Pomona	Pomona	3
DMS (for Fairplex)	White Avenue North of Bonita Avenue (serving southbound traffic)	La Verne	La Verne	3
DMS (for Fairplex)	Arrow Highway West of Wheeler Avenue (serving eastbound traffic)	La Verne	La Verne	3
Trailblazer (for Fairplex)	La Verne Avenue/Fairplex Drive: <ul style="list-style-type: none"> ▪ NB Fairplex Drive south of La Verne Avenue ▪ SB Fairplex Drive north of La Verne Avenue ▪ EB La Verne Avenue west of Fairplex Drive ▪ WB La Verne Avenue east of Fairplex Drive 	Pomona	Pomona	4
Trailblazer (for Fairplex)	Puddingstone Drive/Fairplex Drive: <ul style="list-style-type: none"> ▪ EB Puddingstone Drive west of Fairplex Drive 	Pomona	Pomona	4
Lane Control Signals (for Fairplex)	EB McKinley Avenue between Fairplex Drive and White Avenue	Pomona	Pomona	4

TOTALS:

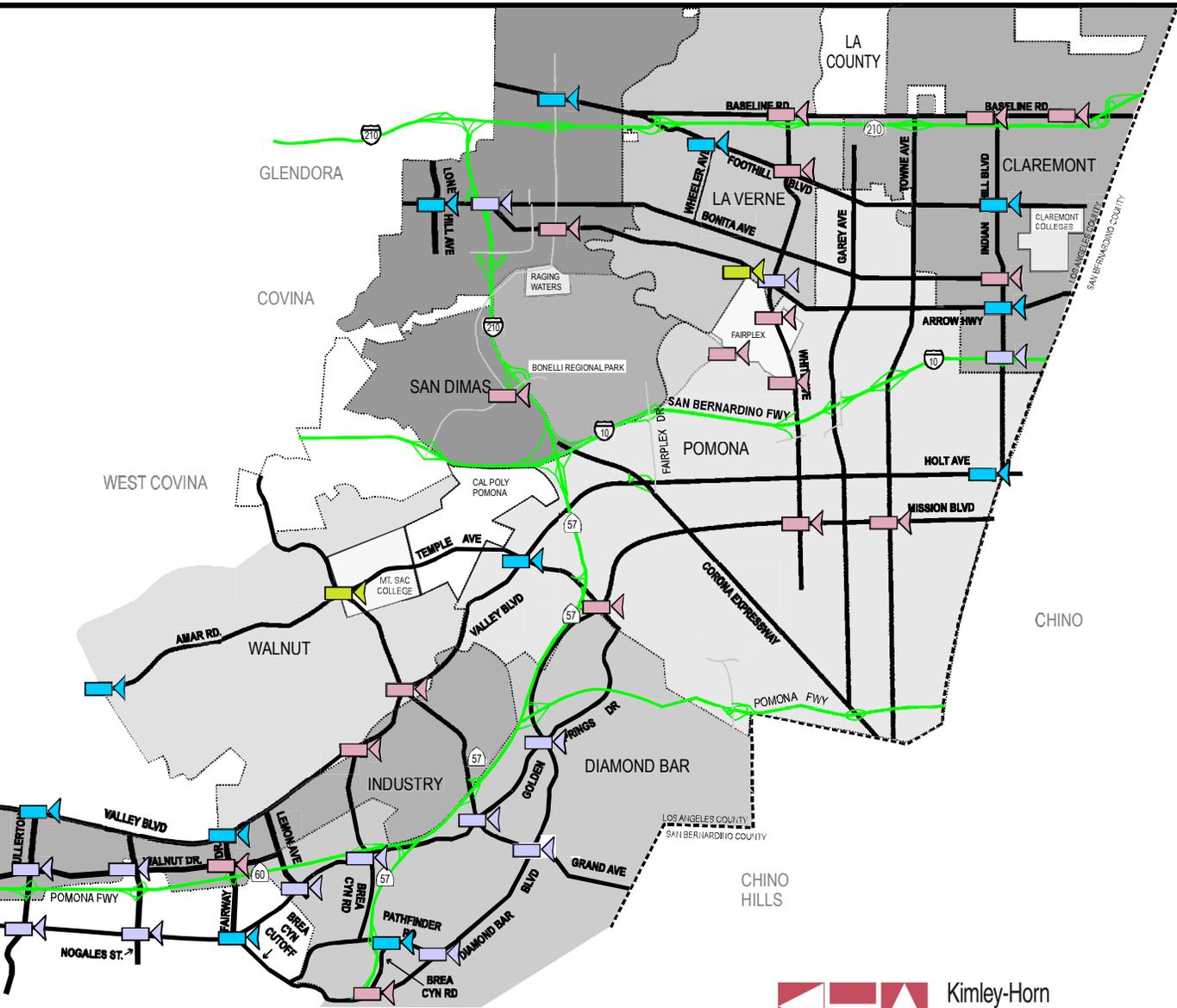
PHASE 1	0
PHASE 3	35
PHASE 4	6
PHASE 5	0
	41



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- COUNTY LIMITS
- CITY LIMITS
- PHASE 1 CCTV CAMERA
- PHASE 3 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA

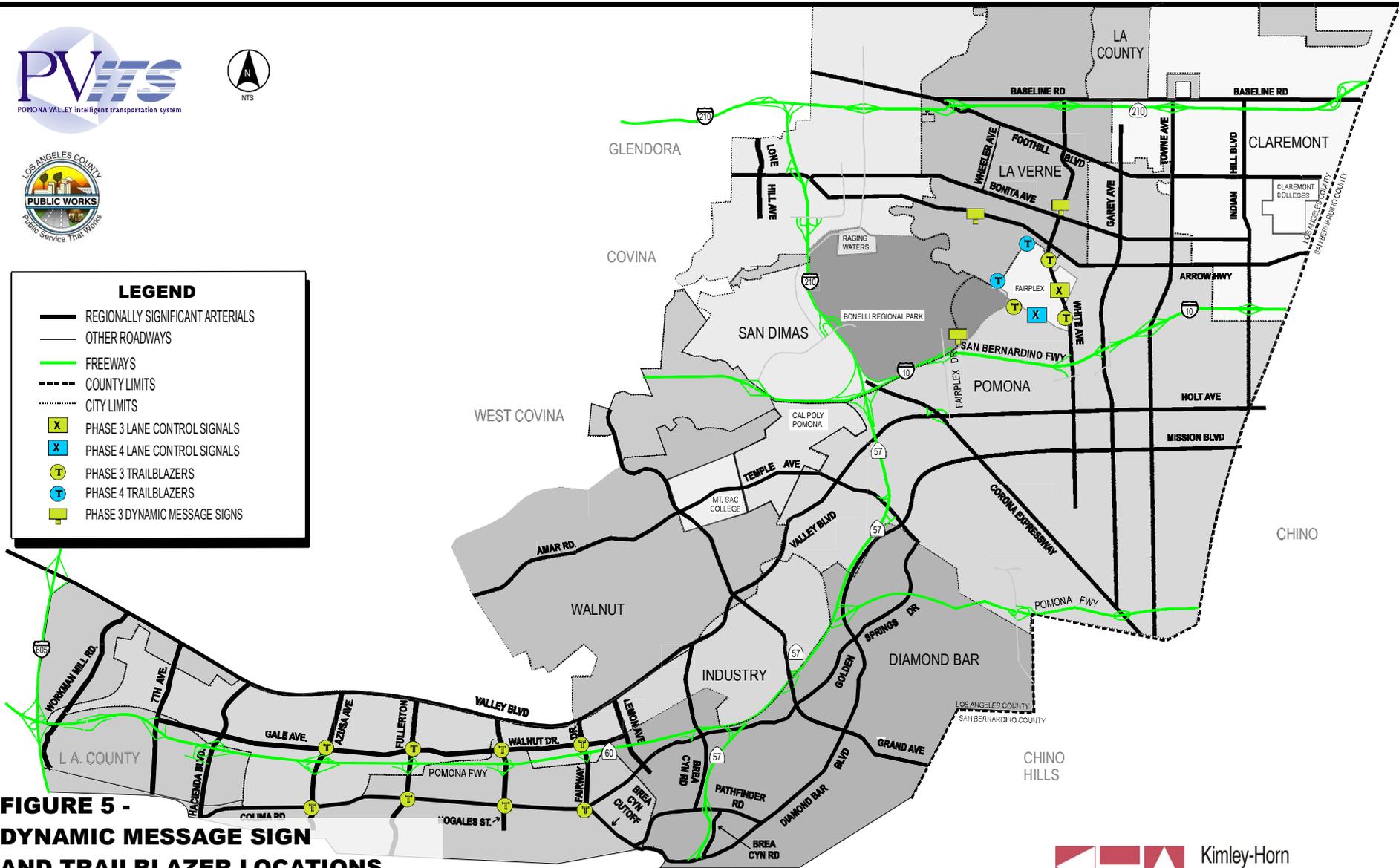
**FIGURE 4 -
CCTV CAMERA LOCATIONS**





LEGEND

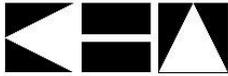
- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- COUNTY LIMITS
- CITY LIMITS
- PHASE 3 LANE CONTROL SIGNALS
- PHASE 4 LANE CONTROL SIGNALS
- PHASE 3 TRAILBLAZERS
- PHASE 4 TRAILBLAZERS
- PHASE 3 DYNAMIC MESSAGE SIGNS



**FIGURE 5 -
DYNAMIC MESSAGE SIGN
AND TRAILBLAZER LOCATIONS**



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3.3.3 Fairplex Event Traffic Management

The Fairplex Event Traffic Management Implementation Plan is a plan to coordinate traffic management to and from the Fairplex during various events. All recommendations described here have been previously developed and described in earlier reports. The ATMS and advanced ITS elements such as CCTV cameras, DMS, and lane control signals, can improve traffic management by providing advanced tools to improve staff efficiency during event management.

The event management plan is recommended for phased implementation as a part of the overall program (phases correspond to program phasing) and is described as follows:

- **Phase 3:** Proposed phase 3 field elements include CCTV cameras, lane control signals on White Avenue to assist in managing traffic, and additional DMS to guide traffic along routes as desired by traffic management staff.
(Coordinated event management plans are proposed to be developed that outline for specific routing desired by local agencies: DMS messages, “manual” lane control [city police and engineering staff currently use cones and barricades to block lanes and manually direct traffic], and new timing plans. Local event traffic management can be supported through a laptop remote workstation connected to the City of Pomona’s traffic signal system. Event management plans can be updated and redesigned based on results following use of these advanced tools at events.)
- **Phase 4:** Additional CCTV cameras are recommended for the fourth implementation phase.
- **Phase 5:** Additional CCTV cameras are recommended for the fourth implementation phase.

The locations of recommended improvements are illustrated in **Figure 6** and in **Figure 7**.



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- FREEWAYS
- CITY LIMITS
- PHASE 1 CCTV CAMERA
- PHASE 3 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- PHASE 4 TRAILBLAZER SIGN
- PHASE 3 DYNAMIC MESSAGE SIGN
- REMOTE ATMS WORKSTATION

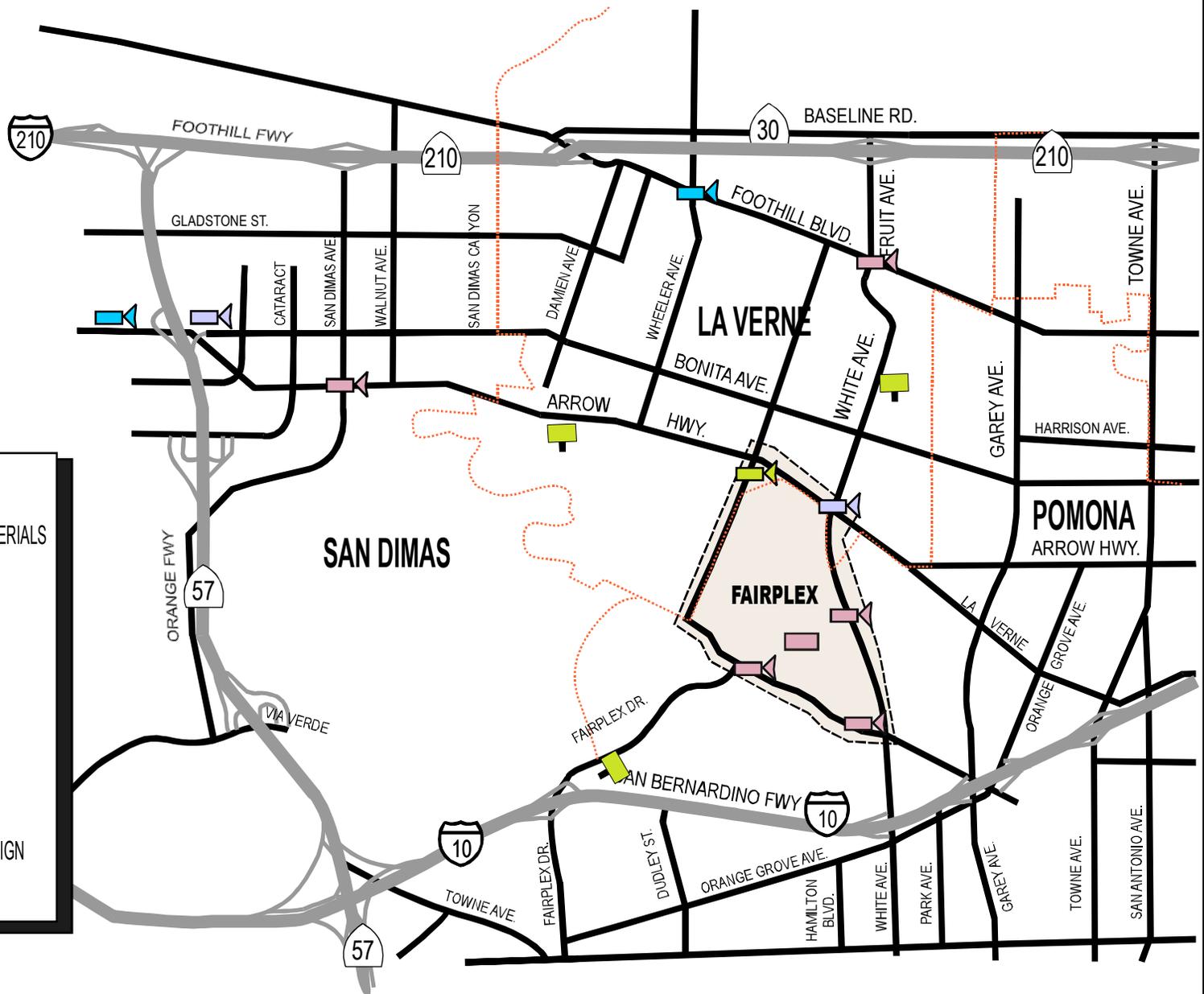
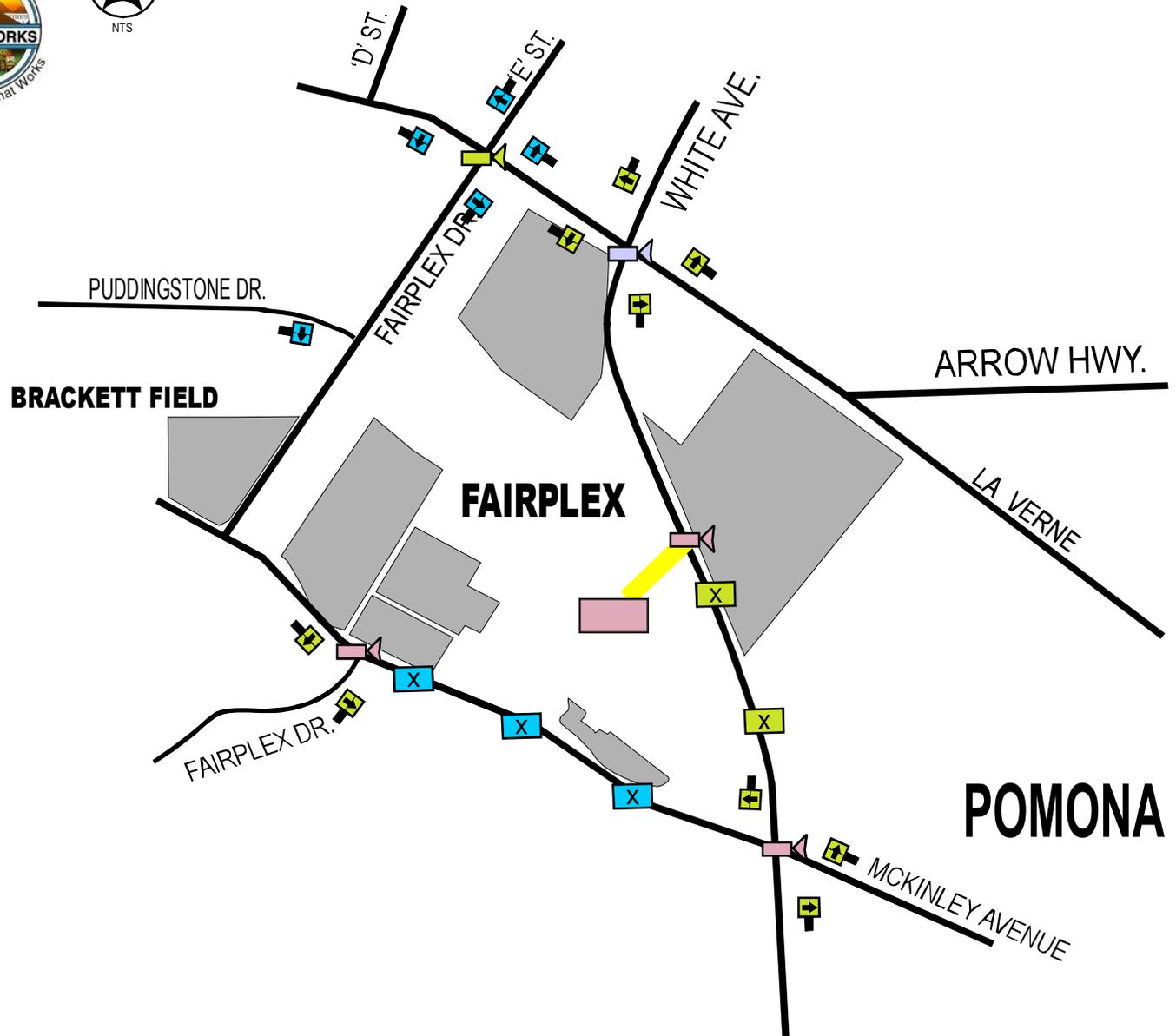


FIGURE 6 - REGIONAL FAIRPLEX EVENT MANAGEMENT PLAN



LA VERNE



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- PHASE 1 CCTV CAMERA
- PHASE 3 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- PHASE 3 TRAILBLAZER SIGN
- PHASE 4 TRAILBLAZER SIGN
- PHASE 3 LANE CONTROL SIGNALS
- PHASE 4 LANE CONTROL SIGNALS
- REMOTE ATMS WORKSTATION
- PARKING AREAS

**FIGURE 7 -
ON-SITE FAIRPLEX EVENT MANAGEMENT PLAN**



3.4 Communications

Communications are required for remote monitoring and control of traffic signals and advanced ITS elements and for agency-to-agency data sharing. *Deliverable 7.2.2 Communication System Alternative Analysis* documented an analysis of available communication technologies and agency-owned versus leased services.

3.4.1 Center-to-Field (Communication with Field Elements)

The center-to-field network design is based on the existing traffic signal interconnect and other existing agency-owned communications supplemented with new leased services. A small segment of interconnect (1.4 miles) is proposed on Colima Road between Stoner Creek Road and Nogales Street where it is more cost effective to complete the hardware interconnect with fiber than to lease connections to each of the traffic signals. In Diamond Bar, much of the city is already interconnected, so several gaps will be upgraded or filled to complete the network. Likewise in Pomona, interconnect is operational in several core areas of the city. This program will supplement the existing interconnect with proposed fiber, spread spectrum radio, and/or leased lines in order to fill several critical gaps in the communication infrastructure.

The MTA allows program funding to be allocated to leasing communication lines under the following conditions (per MTA's leased line policy). The following text was provided by MTA:

- *“Ten year cap on lease expenses.*
- *The County and local agencies participating in the lease of communication lines must sign an agreement with the MTA committing to fund lease costs after 10 years.*
- *Savings achieved from leasing communication lines shall be returned to the MTA.*
- *Agencies entering into leased line agreements will provide all documents to the MTA for review and approval prior to entering into any agreement.*
- *The payment of lease costs in no way implies that the MTA will pay on-going O&M costs associated with this ATMS/ITS program.”*

Summarized, each of the participating agencies must enter into an agreement, stating their intentions to fund the lease costs after the ten year cap has been reached. Additionally, relative to the third bullet listed above, discussions with MTA staff have confirmed that if there are ultimate grant costs savings that are achieved as a result of utilizing lease lines that these funds would be returned to the MTA at the end of the project.

CCTV images are proposed to be transmitted via leased T1 lines (1.544 Mbps). Proposed transmission facilities for other field devices requiring only data communication are data channels of 56 kbps. All leased services will be furnished by SBC Communications, Inc. (a private communications service provider) according to an agreement between Los Angeles County and SBC, from a point adjacent to each field device to a point at the owning agency's LCC.

Leasing telecommunication facilities requires interconnecting each field equipment cabinet to a pullbox adjacent to the nearest telephone company's service provision point. This is usually available within a reasonable distance (150 feet on average) of a signalized intersection.



Connections from Industry and Walnut directly to Alhambra would enable direct control of traffic signals through Los Angeles County's traffic control system (ATMS). Other agencies in the study area are proposed to connect directly to their own signals and would not require connections directly to Los Angeles County's TMC (IEN center-to-center connections are described in the following section). Walnut does not desire second-by-second control or monitoring capabilities; therefore, does not require an ATMS workstation. Industry would like the capability of monitoring their signals once per second; therefore, a remote County ATMS workstation is proposed.

3.4.2 Center-to-Center Communications (Data Sharing Among Partner Agencies)

Each agency in the Forum is recommended to lease a connection to the subregional TMC in Diamond Bar to establish the center-to-center connections via the IEN. An IEN corridor server is proposed to be located at the subregional TMC in Diamond Bar connected, via leased services, to the County-wide IEN server located at the Los Angeles County TMC in Alhambra.

3.5 Local Control Centers and Subregional TMC

Each agency has identified a location for a LCC to be established within currently available office space from which the local traffic can be managed utilizing the ATMS. The LCCs are the locations identified at each city for placement of a computer from which that agency's ATMS is proposed to be operated and the data is proposed to be accessed and shared through the IEN. The site need not necessarily be staffed on a regular basis, but a primary consideration in recommending the location of each site was regular accessibility by staff to monitor and manage traffic utilizing the ATMS and IEN workstations. A subregional TMC is proposed to be located at the City of Diamond Bar that would act as their LCC and additionally would house equipment that could serve the whole subregion, such as the IEN corridor server required for agency integration. Additional monitoring-only IEN workstations have been requested by several agencies as well. Proposed control centers are depicted in **Figure 8**. The details of each proposed LCC and the proposed subregional TMC are provided in the following section.



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- COUNTY LIMITS
- LOCAL CONTROL CENTER
- SUBREGIONAL TMC
- ADDITIONAL MONITORING WORKSTATIONS:
 - POMONA MAINTENANCE YARD
 - POMONA CITY HALL ENGINEERING DEPARTMENT
 - CLAREMONT POLICE DEPARTMENT
 - SAN DIMAS POLICE DEPARTMENT
 - SAN DIMAS FIRE DEPARTMENT
 - SAN DIMAS MAINTENANCE YARD
 - FAIRPLEX
- FREEWAYS
- CITY LIMITS

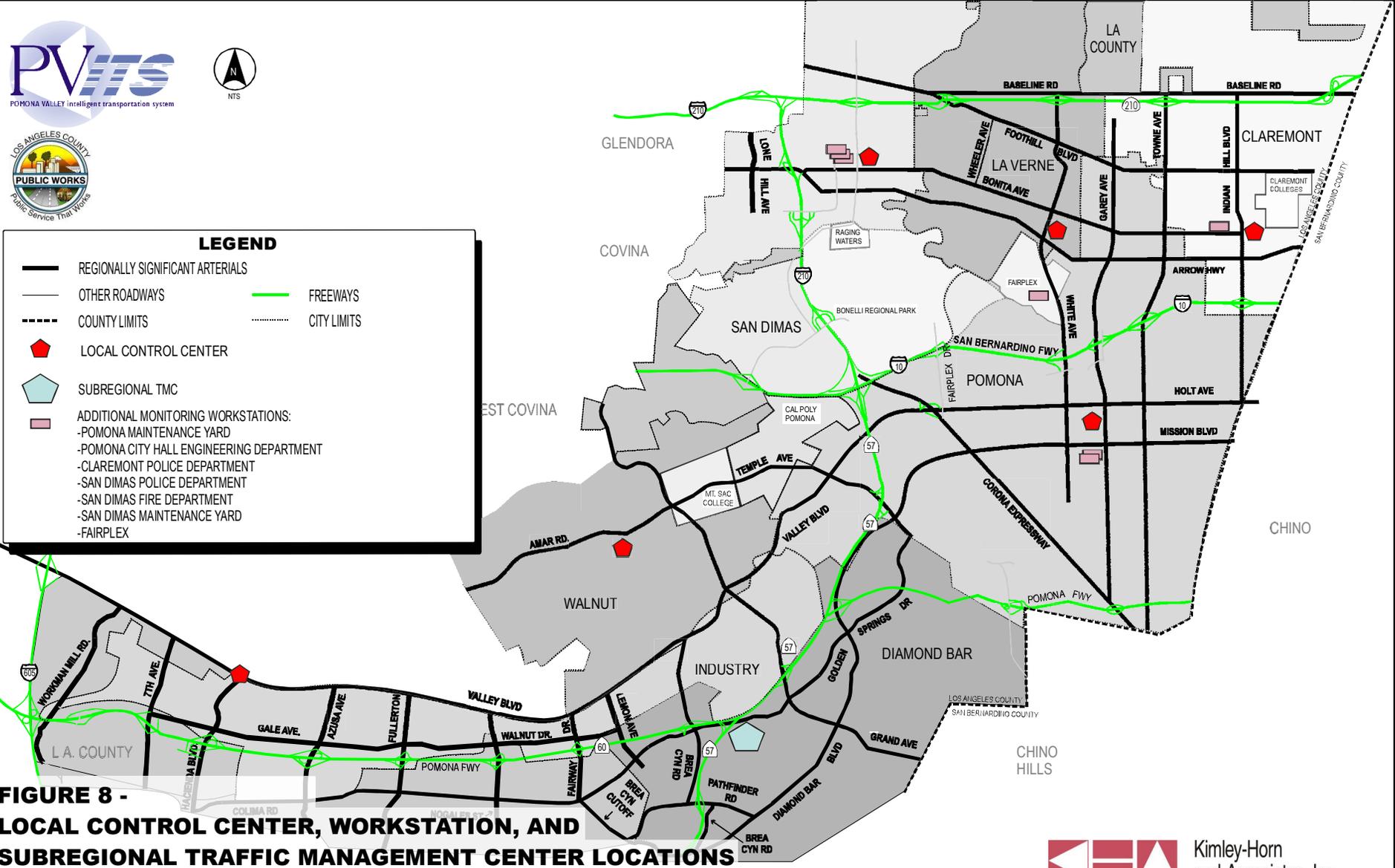
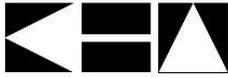


FIGURE 8 - LOCAL CONTROL CENTER, WORKSTATION, AND SUBREGIONAL TRAFFIC MANAGEMENT CENTER LOCATIONS



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3.6 Preliminary Opinions of Cost

Preliminary opinions of cost were developed in order to support the construction phasing of the Pomona Valley ITS program, to estimate the portion of the program that can be procured and built with existing funding, and to estimate future funding requirements. **Table 3** provides a breakdown of the costs and assumptions used to estimate the ATMS procurement and annual operations and maintenance costs. **Table 4** provides a breakdown of the costs and assumptions used to estimate the capital and annual lease costs for the communication to the field equipment. **Tables 5** and **6** provide a breakdown of all preliminary opinions of cost for Phases 1 and 2 (to be funded with existing budgets) and Phases 3 through 5 (representing the full build-out of the program). **Table 7** summarizes the preliminary opinions of costs for the full program.

Table 3 - Preliminary Opinions of Cost for ATMS Implementation

	No. of Signals on Regionally Significant Arterials	No. of 56 kbps Phone Drops Required	Integration with field communications and central modems ¹	Database Configuration/ Population	Estimated Average Capital Cost ^{2,3,4}	TOTAL ESTIMATED CAPITAL COST	Cost per Year per Signal to Contract Operations to LA County DPW ⁵	Total cost per year to Contract Operations to LA County DPW	Estimated Annual Central System Maintenance Cost	TOTAL ESTIMATED O&M COSTS
Claremont ATMS Implementation	22	17	\$ 42,000	\$ 22,000	\$ 155,000	\$ 219,000	-	-	\$ 3,350	\$ 3,350
Diamond Bar ATMS Implementation	59	29	\$ 54,000	\$ 59,000	\$ 155,000	\$ 268,000	-	-	\$ 3,950	\$ 3,950
La Verne ATMS Implementation	14	11	\$ 36,000	\$ 14,000	\$ 155,000	\$ 205,000	-	-	\$ 3,050	\$ 3,050
Pomona ATMS Implementation (existing license)	95	43	\$ 68,000	\$ 95,000	\$ -	\$ 163,000	-	-	\$ 4,650	\$ 4,650
San Dimas ATMS Implementation	33	30	\$ 55,000	\$ 33,000	\$ 155,000	\$ 243,000	-	-	\$ 4,000	\$ 4,000
Agency signals to be controlled by LA County DPW's ATMS:										
Industry	26	26	\$ 2,000	\$ 52,000	\$ 10,000	\$ 64,000	\$ 600	\$ 15,600	\$ 3,800	\$ 19,400
LA County	60	53	\$ 2,000	\$ 120,000	\$ 10,000	\$ 132,000	-	-	\$ 5,150	\$ 5,150
Walnut	16	16	\$ 2,000	\$ 32,000	\$ 10,000	\$ 44,000	\$ 600	\$ 9,600	\$ 3,300	\$ 12,900
	325	225				\$ 1,338,000				\$ 56,450

*All costs assume that the IEN CDI is existing for all systems purchased

¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Pomona has a current license for QuicNet IV; assume no license fee is necessary; capital costs include modems and integration with field only

⁴ Assumes that LA County's purchase of the new ATMS covers license for all signals; capital costs include additional equipment for Industry, Walnut, and County for communications, modems, and integration of signals

⁵ Cost is in addition to current monthly maintenance cost for field equipment (current contracts with LA County DPW are \$49 per traffic signal per month)

Table 4 - Preliminary Opinions of Cost for Field-to-Center Communication Lease Costs

	No. of Signals on Regionally Significant Arterials/ No. of CCTV cameras	No. of Leased Phone Drops Required	Estimated Capital Cost for SBC installation	Data Interface Field Equipment	Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ¹	TOTAL ESTIMATED CAPITAL COST	Annual Lease Cost per Phone Drop	TOTAL ESTIMATED ANNUAL LEASE COSTS
56 kbps leased phone drops for traffic signals								
Claremont owned	22	17	\$ 10,710	\$ 16,150	\$ 76,500	\$ 103,360	\$ 509	\$ 8,650
Diamond Bar ATMS Implementation	59	29	18,270	27,550	130,500	176,320	509	14,755
Industry	26	26	16,380	24,700	117,000	158,080	509	12,720
La Verne ATMS Implementation	14	11	6,930	10,450	49,500	66,880	509	5,597
Los Angeles County	60	53	33,390	50,350	238,500	322,240	509	25,949
Pomona ATMS Implementation (existing license)	95	43	27,090	40,850	193,500	261,440	509	21,370
San Dimas ATMS Implementation	33	30	18,900	28,500	135,000	182,400	509	15,264
Walnut	16	16	10,080	15,200	72,000	97,280	509	8,141
T1 = 1.544 Mbps leased phone drops for CCTV cameras								
Phase 1	16	16	\$ 20,272			\$ 20,272	\$ 2,112	\$ 33,792
Phase 3	9	9	11,403			11,403	2,112	19,008
Phase 4	14	14	17,738			17,738	2,112	29,568
Phase 5	18	18	22,806			22,806	2,112	38,016
Traffic Signal Totals	325	225	\$ 141,750	\$ 213,750	\$ 1,012,500	\$ 1,368,000		\$ 112,445
CCTV Camera Totals	57	57	\$ 72,219			\$ 72,219		\$ 120,384

¹ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

Table 5 – Phases 1 and 2 Preliminary Opinion of Cost

Project Element	Preliminary Opinions of Cost		Project Quantities			5/10 year O&M from program budget ^{4, 5}
	Estimated Average Implementation Cost ⁶	Estimated Average Annual O&M Cost ⁷	Project Quantities	Implementation Cost	Annual O&M Cost	
Phase 1						
ATMS (assumes IEN CDI existing for all systems purchased)						
Claremont ATMS Implementation	\$ 219,000	\$ 3,350	1	\$ 219,000	\$ 3,350	-
Diamond Bar ATMS Implementation	\$ 268,000	\$ 3,950	1	\$ 268,000	\$ 3,950	-
Industry Integration of Traffic Signals with LA County's ATMS	\$ 64,000	\$ 19,400	1	\$ 64,000	\$ 19,400	-
La Verne ATMS Implementation	\$ 205,000	\$ 3,050	1	\$ 205,000	\$ 3,050	-
Los Angeles County Integration of County Signals in Pomona Valley Area	\$ 132,000	\$ 5,150	1	\$ 132,000	\$ 5,150	-
Pomona ATMS Implementation	\$ 163,000	\$ 4,650	1	\$ 163,000	\$ 4,650	-
San Dimas ATMS Implementation	\$ 243,000	\$ 4,000	1	\$ 243,000	\$ 4,000	-
Walnut Integration of Traffic Signals with LA County's ATMS	\$ 44,000	\$ 12,900	1	\$ 44,000	\$ 12,900	-
170E Controller Upgrade with QUAD UART HC-11	\$ 375	\$ -	178	\$ 66,750	\$ -	-
Other Controller Upgrade to 170ATC	\$ 1,500	\$ -	144	\$ 216,000	\$ -	-
Communication ⁸						
Leased lines for traffic signals (56 kbps phone drops)	(note 9)	(note 9)	225	\$ 1,368,000	\$ 112,445	\$ 1,124,448
Leased lines for phase 1 CCTV cameras (T1 = 1.544 Mbps phone drops)	(note 9)	(note 9)	9	\$ 20,272	\$ 33,792	\$ 168,960
Control Centers (includes operator workstation computers, furniture, racks, and construction)						
Claremont LCC	\$ 8,000	\$ 400	1	\$ 8,000	\$ 400	-
Diamond Bar Interim Subregional TMC (including video display)	\$ 70,000	\$ 3,500	1	\$ 70,000	\$ 3,500	-
Industry LCC	\$ 8,000	\$ 400	1	\$ 8,000	\$ 400	-
La Verne LCC	\$ 8,000	\$ 400	1	\$ 8,000	\$ 400	-
Pomona LCC	\$ 20,000	\$ 1,000	1	\$ 20,000	\$ 1,000	-
San Dimas LCC	\$ 8,000	\$ 400	1	\$ 8,000	\$ 400	-
Walnut LCC (IEN workstation only)	\$ 3,000	\$ 150	1	\$ 3,000	\$ 150	-
Fairplex workstation	\$ 3,000	\$ 150	1	\$ 3,000	\$ 150	-
LA County Regional TMC (1)	\$ 10,000	\$ 500	1	\$ 10,000	\$ 500	-
Advanced ITS Elements						
CCTV Cameras	\$ 30,000	\$ 1,500	9	\$ 270,000	\$ 13,500	-
SUBTOTAL PHASE 1 PRELIMINARY OPINION OF COST				\$ 3,417,022	\$ 223,087	\$ 1,293,408
Phase 2						
Agency Integration						
Subregional IEN Corridor Server	\$ 25,000	\$ 1,250	1	\$ 25,000	\$ 1,250	(note 4)
Local IEN Servers (incl. Fairplex, not needed for LA County)	\$ 3,000	\$ 150	8	\$ 24,000	\$ 1,200	(note 4)
IEN workstation software (GUI) integration (incl. Fairplex) (note 1)	\$ 30,000	\$ 1,500	8	\$ 240,000	\$ 12,000	(note 4)
Center-to-center communication						
IEN connections for each agency to PVITS IEN server (incl. Fairplex) (note 2) (T1 = 1.544 Mbps)	\$ 1,267	\$ 4,800	7	\$ 8,869	\$ 33,600	\$ 336,000
IEN connection from IEN server (Diamond Bar) to IEN network (Alhambra) (T1 = 1.544 Mbps)	\$ 1,267	\$ 4,800	1	\$ 1,267	\$ 4,800	\$ 48,000
SUBTOTAL PHASE 2 PRELIMINARY OPINION OF COST				\$ 299,136	\$ 52,850	\$ 384,000
Subtotal Phases 1 & 2				\$ 3,716,158	\$ 275,937	\$ 1,677,408
Phases 1&2 Budget Breakdown based on preliminary opinions of cost						
Construction Preliminary Opinion of Cost				\$ 2,079,022		
System Procurement Preliminary Opinion of Cost				\$ 1,637,136		
Conceptual Design				\$ 852,000		
PS&E for Comm, CCTV, controllers				\$ 650,000		
Program Management, ATMS Design, Testing, etc.				\$ 600,000		
County Labor (ITD, OSD, PM)				\$ 378,000		
Construction Administration (15% of Construction Budget)				\$ 69,300		
Miscellaneous (Mobilization and Traffic Control 5% of construction budget)				\$ 104,000		
TOTAL PHASES 1 and 2 PRELIMINARY OPINION OF COST				\$ 6,369,458	\$ 275,937	\$ 1,677,408

Table 6 – Phases 3, 4, and 5 Preliminary Opinion of Cost

Project Element	Preliminary Opinions of Cost		Project Quantities		
	Estimated Average Installation Cost ⁶	Estimated Average Annual O&M Cost ⁷	Project Quantities	Installation Cost	Annual O&M Cost
Phase 3					
Communication ⁸					
Leased lines for phase 3 CCTV cameras (T1 = 1.544 Mbps phone drops, qu	(note 9)	(note 9)	9	\$ 11,403	\$ 19,008
Control Centers					
Pomona LCC (front projection video wall)	\$ 50,000	\$ 2,500	1	\$ 50,000	\$ 2,500
Advanced ITS Elements					
CCTV Cameras	\$ 30,000	\$ 1,500	9	\$ 270,000	\$ 13,500
Trailblazers (for SR-60)	\$ 8,000	\$ 800	22	\$ 176,000	\$ 17,600
DMS	\$ 75,000	\$ 7,500	3	\$ 225,000	\$ 22,500
Lane Control Signals	\$ 20,000	\$ 2,000	2	\$ 40,000	\$ 4,000
Development of Event Management Plans	\$ 15,000	-	4	\$ 60,000	-
Subtotal Preliminary Opinion of Cost				\$ 832,403	\$ 79,108
Supplemental (10%)				\$ 84,000	
Contingency (15%)				\$ 125,000	
Engineering Cost (35%)				\$ 292,000	
Miscellaneous (Mobilization and Traffic Control 5%)				\$ 42,000	
TOTAL PHASE 3 PRELIMINARY OPINION OF COST				\$ 1,375,403	\$ 79,108
Phase 4					
Communication ⁸					
Leased lines for phase 4 CCTV cameras (T1 = 1.544 Mbps phone drops, qu	(note 9)	(note 9)	14	\$ 17,738	\$ 29,568
Control Centers					
Pomona LCC (front projection video wall)	\$ 50,000	\$ 5,000	1	\$ 50,000	\$ 5,000
Advanced ITS Elements					
CCTV Cameras	\$ 30,000	\$ 1,500	14	\$ 420,000	\$ 21,000
Trailblazers	\$ 8,000	\$ 800	6	\$ 48,000	\$ 4,800
Lane Control Signals	\$ 20,000	\$ 2,000	3	\$ 60,000	\$ 6,000
Subtotal Preliminary Opinion of Cost				\$ 595,738	\$ 66,368
Supplemental (10%)				\$ 60,000	
Contingency (15%)				\$ 90,000	
Engineering Cost (35%)				\$ 209,000	
Miscellaneous (Mobilization and Traffic Control 5%)				\$ 30,000	
TOTAL PHASE 4 PRELIMINARY OPINION OF COST				\$ 984,738	\$ 66,368
Phase 5					
Communication ⁸					
Leased lines for phase 5 CCTV cameras (T1 = 1.544 Mbps phone drops, qu	(note 9)	(note 9)	18	\$ 22,806	\$ 38,016
Control Centers					
Additional monitoring only workstations	\$ 3,000	\$ 300	0	\$ -	\$ -
Advanced ITS Elements					
CCTV Cameras	\$ 30,000	\$ 1,500	18	\$ 540,000	\$ 27,000
Subtotal Preliminary Opinion of Cost				\$ 562,806	\$ 65,016
Supplemental (10%)				\$ 56,000	
Contingency (15%)				\$ 84,000	
Engineering Cost (35%)				\$ 197,000	
Miscellaneous (Mobilization and Traffic Control 5%)				\$ 29,000	
TOTAL PHASE 5 PRELIMINARY OPINION OF COST				\$ 928,806	\$ 65,016

Notes for Tables 5 and 6

<p><i>(1) Majority of construction costs will be incurred under a different LA County program</i></p>
<p><i>(2) Costs for LA County TMC IEN installation will be incurred under a different LA County program; Diamond Bar ATMS will be hardwired to IEN server, no lease line required</i></p>
<p><i>(3) Additional direct lease lines required from Industry, Walnut and LA County local office in Hacienda Heights</i></p>
<p><i>(4) Annual O&M costs for equipment maintenance will be incurred by cities by separate funding sources</i></p>
<p><i>(5) Annual lease costs for traffic signal communications are estimated for ten years, Annual lease costs for other elements are estimated over 5 years; annual maintenance costs cannot be funded by program budget per MTA guidelines</i></p>
<p><i>(6) See Appendix A - "Preliminary Opinions of Cost for ATMS Implementation, Operations, and Maintenance" and corresponding notes</i></p>
<p><i>(7) Costs include annual cost to contract operations to LA County DPW and are in addition to current contracts for signal maintenance; costs include annual maintenance for central system equipment; no costs are included for current field equipment maintenance</i></p>
<p><i>(8) Costs are as provided by Los Angeles County DPW per agreement with SBC Communications, Inc.</i></p>
<p><i>(9) See Appendix A - "Preliminary Opinions of Cost for Communication Lease Costs"</i></p>

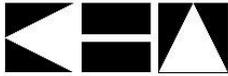
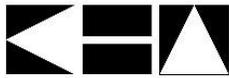


Table 7 – Overall Program Preliminary Opinion of Cost

Phase	Preliminary Capital Budget Estimate	Annual O&M Cost	5/10 year O&M to be funded by program budget*
Phase 1	\$6,070,322	\$223,087	\$1,293,408
Phase 2	\$299,136	\$52,850	\$384,000
Phase 3	\$1,375,403	\$79,108	
Phase 4	\$984,738	\$66,368	
Phase 5	\$928,806	\$65,016	
TOTAL PROGRAM	\$9,658,405	\$486,429	\$1,677,408
TOTAL PROGRAM TO BE FUNDED BY CURRENT PROGRAM FUNDS			\$8,046,866

*Annual lease costs for traffic signal communications are estimated for ten years, annual lease costs for other elements are estimated over 5 years; annual maintenance costs cannot be funded by program budget per MTA guidelines



4.0 INDIVIDUAL AGENCY SUMMARIES

4.1 City of Claremont

The City engineering staff is located within the City of Claremont City Hall, which is located at 207 Harvard Avenue. The City has identified a location for the proposed LCC in a spare space in the engineering department between the City Engineer’s office and the City’s electrical room. **Figure 9** depicts the concept design for the City of Claremont LCC.

The City of Claremont LCC is proposed to include an ATMS workstation and an IEN workstation (computers) with one monitor per workstation. The Claremont LCC would not have a dedicated video wall, but would use the workstations for CCTV video monitoring. Racks in the existing electrical room would contain traffic signal and CCTV camera controller and communication equipment. City staff would reorganize existing equipment in the electrical room in order to fit new computers and communication equipment needed for the monitoring and control of traffic signals and CCTV cameras and data sharing with other agencies via the IEN. Equipment to be located at the LCC in Claremont (installed as a part of deployment phase 1) is summarized as follows:

Equipment	Quantity
ATMS workstation (computer)	1
IEN workstation (computer)	1
Monitors (one monitor per workstation listed above)	2
19” equipment rack placed in the existing computer/communication room to contain traffic signal and CCTV control and monitoring equipment including:	1
ATMS server (computer that runs the proposed ATMS)	1
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems)	1
modems for communication with traffic signals (16 phone drops [56 kbps] will be required to complete communication with 21 traffic signals on regionally significant arterials)	16
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with CCTV cameras)	1
IEN site server (to enable Claremont to connect to the IEN for data exchange with other agencies)	1
Additional monitoring-only IEN workstation to be located at the Claremont Police Department (future deployment)	1

The City does not intend to regularly staff the LCC, but rather would utilize the tools provided in the LCC as needed with existing staff to monitor traffic, change traffic signal timing, and coordinate special events.

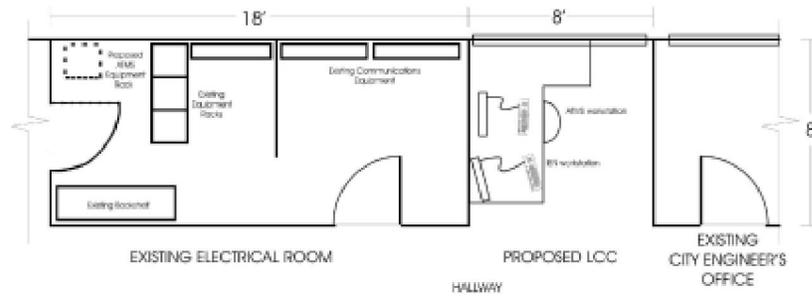
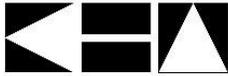


Figure 9 – Proposed City of Claremont LCC Layout

A summary of the field equipment to be installed in the City of Claremont is summarized in **Table 8** and depicted in **Figure 10**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. **Table 9** summarizes the preliminary opinions of cost for the Claremont system. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of a 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 8 – Summary of Claremont Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
21 Traffic Signals to be connected to ATMS (16 lease line 56 kbps phone drops)			1
CCTV Camera	Indian Hill Boulevard/San Jose	Claremont	1
CCTV Camera	Foothill Blvd. / Indian Hill Blvd.	Caltrans	4
CCTV Camera	Arrow Highway / Indian Hill Blvd.	Claremont	4
CCTV Camera	Indian Hill Blvd./ Bonita Avenue	Claremont	5
CCTV Camera	Baseline Road / Indian Hill Blvd.	Caltrans	5
CCTV Camera	Baseline Road / Mills Avenue	Caltrans	5

Table 9 - Summary of Claremont Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	
Preliminary Opinions of Cost for ATMS Implementation											
Integration with field communications and central modems ¹	\$ 42,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 22,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ²	\$ 155,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual hardware and software maintenance	\$ -	\$ 3,350	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 219,000	\$ 3,350	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs											
Estimated Capital Cost for SBC installation	\$ 11,977	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,534	\$ -	\$ 3,801	\$ -	\$ -
Data Interface Field Equipment	\$ 16,150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ³	\$ 76,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)		\$ 10,762	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,224	\$ -	\$ 6,336	\$ -
Subtotal	\$ 104,627	\$ 10,762	\$ -	\$ -	\$ -	\$ -	\$ 2,534	\$ 4,224	\$ 3,801	\$ 6,336	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)											
	\$ 8,000	\$ 400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication											
	\$ -	\$ -	\$ 34,267	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment											
CCTV (capital and annual maintenance)	\$ 30,000	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ 3,000	\$ 90,000	\$ 4,500	\$ -
Controller and Cabinet Upgrades	\$ 19,125	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers (capital and annual maintenance)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 49,125	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ -	\$ 90,000	\$ 4,500	\$ -
Grand Total	\$ 380,752	\$ 16,012	\$ 34,267	\$ 4,800	\$ -	\$ -	\$ 62,534	\$ 4,224	\$ 93,801	\$ 10,836	\$ -

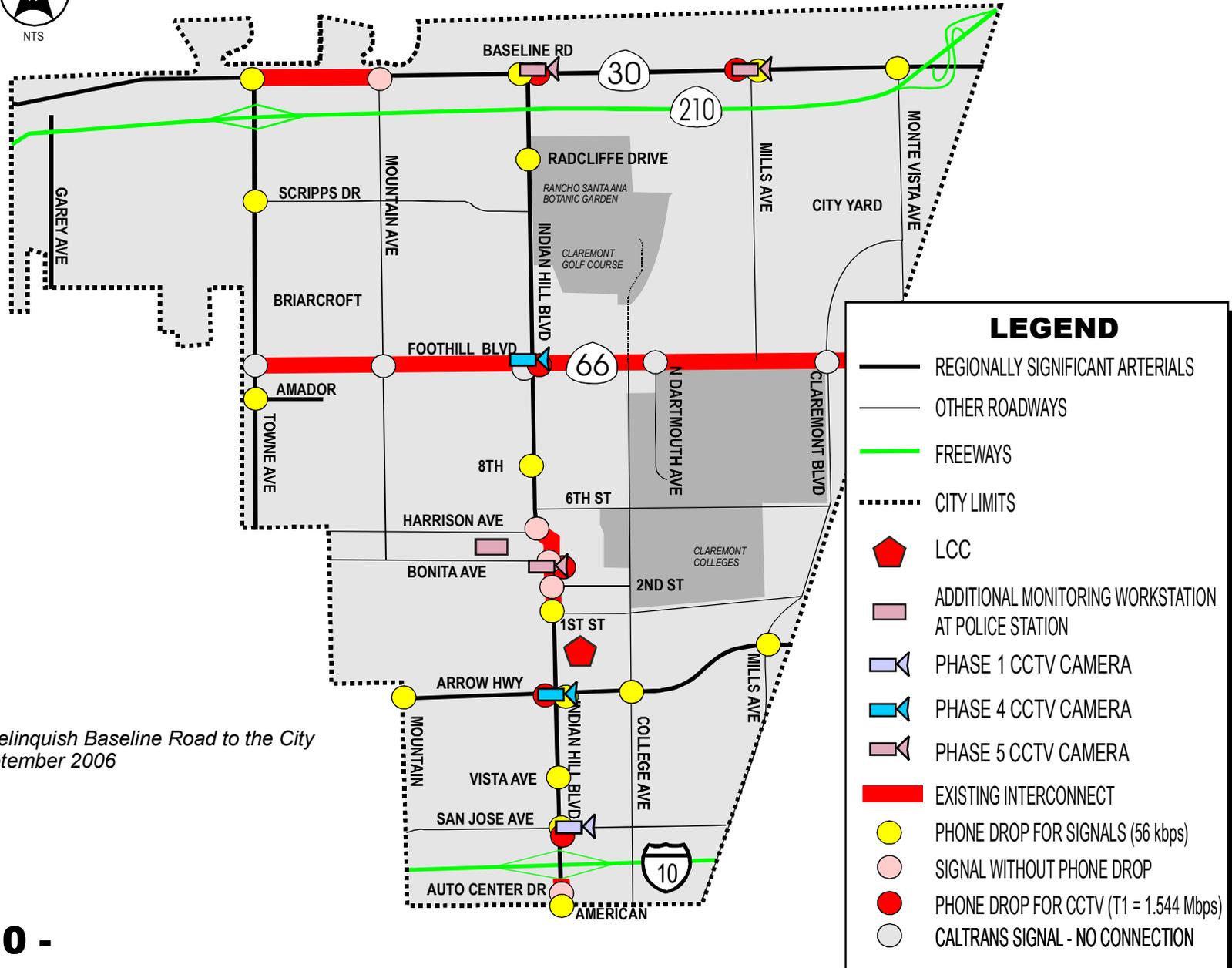
Notes

¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁴ The first ten years of signal lease costs and the first five years of CCTV camera lease costs will be funded by the existing program budget



Note: Caltrans will relinquish Baseline Road to the City of Claremont in September 2006

**FIGURE 10 -
CITY OF CLAREMONT - CONCEPT DESIGN**



4.2 Diamond Bar

The subregional TMC is proposed to be located in Diamond Bar and is the location where the Forum's centralized traffic management components are proposed to be located. The subregional TMC would house the IEN corridor server that allows all of the individual agencies in the Pomona Valley subregion to connect to the county-wide communication network for sharing of data within and outside of the Forum.

The subregional TMC may also serve subregional traffic management and control roles in the future as the Pomona Valley member agencies decide. For example, in the future, 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 traffic signals in the subregion that are not necessarily in Diamond Bar's jurisdiction. While this function would not be implemented initially, it may be implemented in the future upon approval by each individual member agency.

The site of the proposed subregional TMC at City of Diamond Bar City Hall is 21825 East Copley Drive in the Air Quality Management District (AQMD) building. **Figure 11** is a photo of the front of the building. The City recently entered into a ten-year lease (with an option to purchase the space) with AQMD. Initially, an interim TMC would be established within vacant space under the City's current lease. It is estimated that this interim TMC would be adequate for the subregion for five or more years. The City of Diamond Bar agreed to provide the space to the subregional TMC free of charge.

In the long-term, if Diamond Bar begins to perform more subregional functions on behalf of the other agencies, and additional staff is required, the subregion may construct a larger TMC that would require leasing additional space adjacent to Diamond Bar City Hall. This ultimate subregional TMC is further documented in **Section 4.1.2**. This additional space would be incorporated into the City's lease agreement. Though one agency may choose to carry the burden of the additional lease costs on behalf of the subregion, many areas in the Country that have successfully established multi-agency ATMS/ITS programs have done so by signing joint agreements for funding the programs through fair-share formulas. It has been noted that coming to agreement among the agencies in the subregion on a jointly funded TMC lease may be challenging and may limit the opportunity to construct this TMC.

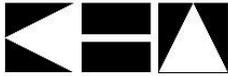


Figure 11 – AQMD Building in the City of Diamond Bar



4.2.1 Interim Subregional TMC

The room available for the proposed subregional TMC site is existing office space within the Diamond Bar City Hall that is currently vacant and is approximately 150 square feet. **Figure 12** depicts the layout of the proposed interim subregional TMC. Modifications to develop the interim subregional TMC at the City of Diamond Bar include construction of walls and a door, wiring to connect the space to the IS/communications room at the opposite end of the hall, and installation of a small video monitor. Additionally, a proposed equipment rack in the available space in the existing IS/communications room is proposed to house needed servers and communication equipment. Equipment proposed to be located at the interim subregional TMC (installed as a part of deployment phase 1) in Diamond Bar is summarized as follows:

Equipment	Quantity
ATMS workstations (computers)	2
IEN workstations (computers)	2
Monitors (one monitor per workstation listed above)	4
Dedicated video monitor for CCTV and ATMS viewing	1
19" equipment racks placed in the existing computer/communication room to contain traffic signal and CCTV control and monitoring equipment including:	1
ATMS server (computer that runs the proposed ATMS)	1
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems)	1
modems for communication with traffic signals (29 phone drops will be required to communicate with 59 traffic signals on regionally significant arterials)	29
Video wall processor (computer that runs the video wall, would come with the video monitor listed above)	1
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with eight CCTV cameras at full-build-out)	1
IEN corridor server (to enable all agencies in the Pomona Valley to connect to the IEN)	1
IEN site server (to enable Diamond Bar to connect to the IEN for data exchange with other agencies)	1

Initially, the subregional TMC is not proposed to have a dedicated staff, but the TMC would be utilized as needed, particularly during the morning and afternoon peak periods. The staff is proposed to consist of existing Diamond Bar engineering staff.

It is recommended for all staff members of the subregional TMC as well as users of the LCC sites to complete training, including how to operate the traffic signal system (ATMS) and IEN, exchange information with other localities and systems, and operate CCTV cameras. This training is proposed to be provided by the County as a part of this Pomona Valley ITS program.

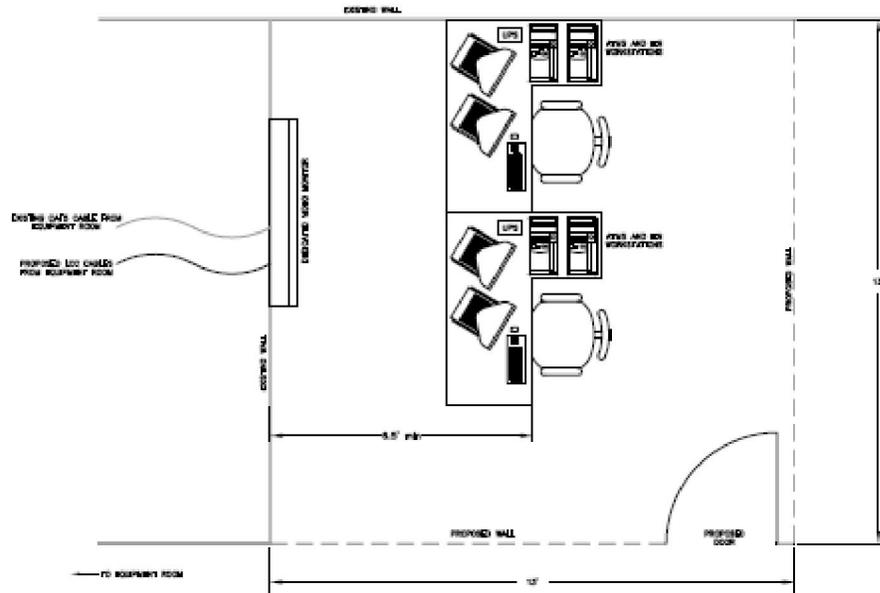


Figure 12 – Proposed Interim Subregional TMC Layout at the City of Diamond Bar

A summary of the field equipment proposed to be installed in the City of Diamond Bar is summarized in **Table 10** and depicted in **Figure 13**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. **Table 11** is a summary of the preliminary opinions of cost. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of a 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 10 – Summary of Diamond Bar Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
59 Traffic Signals to be connected to ATMS (29 lease line 56 kbps phone drops)			1
CCTV Camera	Golden Springs Drive / Grand Avenue	Diamond Bar	1
CCTV Camera	Grand Avenue / Diamond Bar Blvd.	Diamond Bar	1
CCTV Camera	Diamond Bar Blvd. / Golden Springs Drive	Diamond Bar	1
CCTV Camera	Diamond Bar Blvd. / Pathfinder Road	Diamond Bar	1
CCTV Camera	Brea Canyon Road / Golden Springs Drive	Diamond Bar	1
CCTV Camera	Golden Springs Drive / Lemon Avenue	Diamond Bar	1
CCTV Camera	Pathfinder Road / Brea Canyon Rd. / Fern Hollow	Diamond Bar	4
CCTV Camera	Brea Canyon Road / Diamond Bar Blvd.	Diamond Bar	5

Table 11 - Summary of Diamond Bar Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	
Preliminary Opinions of Cost for ATMS Implementation											
Integration with field communications and central modems ¹	\$ 54,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 59,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ²	\$ 155,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual hardware and software maintenance	\$ -	\$ 3,950	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 268,000	\$ 3,950	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs											
Estimated Capital Cost for SBC installation	\$ 25,872	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,267	\$ -	\$ 1,267	\$ -	\$ -
Data Interface Field Equipment	\$ 27,550	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ³	\$ 130,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 27,427	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,112	\$ -	\$ 2,112	\$ -
Subtotal	\$ 183,922	\$ 27,427	\$ -	\$ -	\$ -	\$ -	\$ 1,267	\$ 2,112	\$ 1,267	\$ 2,112	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)											
	\$ 70,000	\$ 3,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication⁴											
	\$ -	\$ -	\$ 59,267	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment											
CCTV (capital and annual maintenance)	\$ 180,000	\$ 9,000	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ 30,000	\$ 1,500	\$ -
Controller and Cabinet Upgrades	\$ 39,375	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers (capital and annual maintenance)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 219,375	\$ 9,000	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ 30,000	\$ 1,500	\$ -
Grand total	\$ 741,297	\$ 43,877	\$ 59,267	\$ 4,800	\$ -	\$ -	\$ 31,267	\$ 3,612	\$ 31,267	\$ 3,612	\$ -

Notes

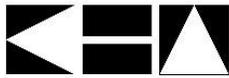
¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁴ Diamond Bar ATMS will be hardwired to IEN server, lease line required only to connect the subregion to Alhambra

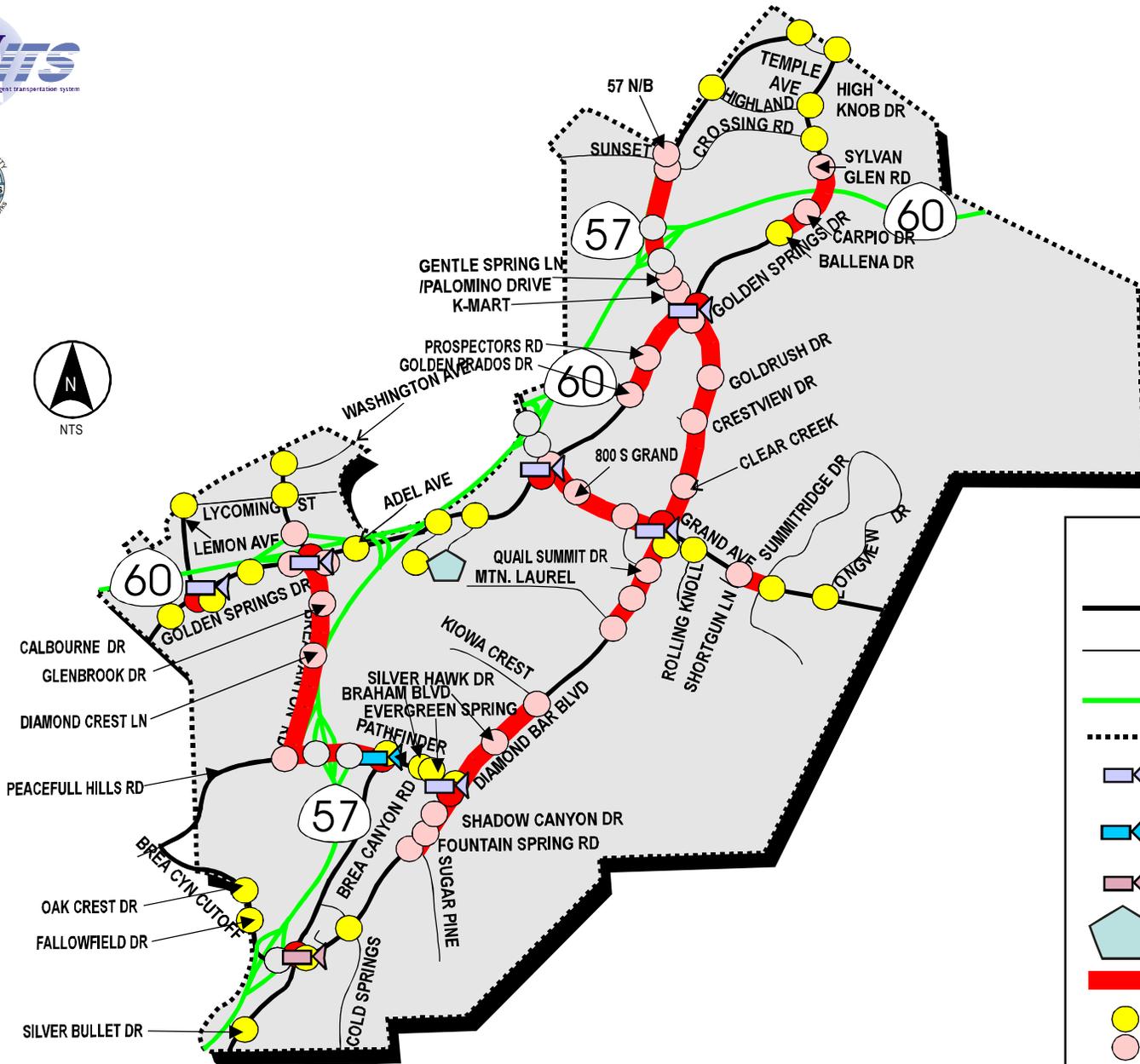
⁵ The first ten years of signal lease costs and the the first five years of CCTV camera lease costs will be funded by the existing program budget



4.2.2 *Ultimate Subregional TMC*

The full build-out TMC would be implemented when and if the Pomona Valley Agencies deem it to be necessary. The ultimate TMC has been conceptually designed to meet the following requirements:

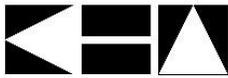
- It is estimated that 700 – 1000 square feet would be necessary for the subregional TMC based upon the findings presented in the December 27, 2002 Subregional TMC Report, Section 3.0, page 5. This space would be adequate to accommodate:
 - Control Room (three to five operator workstations in the ultimate build-out);
 - Video Wall (including ample room for maintenance access);
 - Equipment and communication room (for storage of several racks for servers described above and with access to external communication feeds from the field); and
 - The space should also accommodate or provide access to a conference room, break room and rest rooms (these could be provided by an adjacent facility and are not included in the square footage recommended).
 - Space is not considered to be needed for staff offices since no new staff is proposed for the subregional TMC.
- It is recommended that the subregional TMC be staffed during peak periods at a minimum if possible. If not regularly staffed, the TMC should be easily accessible by traffic engineering staff throughout the day to utilize the tools provided for traffic signal maintenance and traffic management.



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- CITY LIMITS
- PHASE 1 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- SUBREGIONAL TMC
- EXISTING INTERCONNECT
- PHONE DROP FOR SIGNALS (56 kbps)
- SIGNAL WITHOUT PHONE DROP
- PHONE DROP FOR CCTV (T1 = 1.544 mbps)
- CALTRANS SIGNAL - NO CONNECTION

**FIGURE 13 -
 CITY OF DIAMOND BAR - CONCEPT DESIGN**



4.3 City of Industry

The City of Industry City Hall is located at 15651 East Stafford Street. The City engineering staff is at the same location. The Industry LCC is proposed to be located in an existing office space. An ATMS workstation and an IEN workstation (computers) would be located on existing desks in this open area where staff will have direct access to the workstations as needed. The ATMS workstation would be connected to the Los Angeles County ATMS to enable the City of Industry to monitor and control (if desired) traffic signals on a second-by-second basis. **Figure 14** depicts the area where the ATMS and IEN workstations would be placed, comprising the Industry LCC. The proposed Industry LCC would not have a dedicated video wall for CCTV monitoring, but would use the ATMS and IEN workstations for monitoring. Under this proposal, the City of Industry has intentions to expand their current agreement with Los Angeles County that contracts maintenance of their traffic signals to the County to also include traffic signal monitoring and operations. As such, the ATMS and IEN workstations would allow for monitoring of the City’s traffic signals and would also enable control if desired.

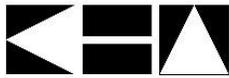
It is proposed that all traffic signal and CCTV communication equipment (such as modems) be located at the County’s TMC in Alhambra to facilitate the County’s troubleshooting, operations, and maintenance responsibilities.

Equipment to be located at the LCC in City of Industry is summarized as follows:

Equipment	Quantity
ATMS workstation (computer)	1
IEN workstation (computer)	1
Monitors (one monitor per workstation listed above)	2
IEN site server (to enable Industry to connect to the IEN for data exchange with other agencies)	1



Figure 14 – City of Industry LCC Location



A summary of the field equipment to be installed in the City of Industry is summarized in **Table 12** and depicted in **Figure 15**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of the preliminary opinions of cost is presented in **Table 13**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of an 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 12 – Summary of Industry Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
26 Traffic Signals to be connected to Los Angeles County’s ATMS (26 lease line 56 kbps phone drops)			1
CCTV Camera	Azusa Avenue / Gale Avenue	Industry	1
CCTV Camera	Gale Avenue / Fullerton Road	Industry	1
CCTV Camera	Colima Road / Azusa Avenue	Industry / LA County	1
CCTV Camera	Gale Avenue / Seventh Street	Industry	3
CCTV Camera	Valley Boulevard / Hacienda Boulevard	Industry	3
Trailblazer	Gale Avenue/Azusa Avenue: <ul style="list-style-type: none"> ▪ NB Azusa Avenue south of Gale Avenue ▪ EB Gale Avenue west of Azusa Avenue ▪ WB Gale Avenue east of Azusa Avenue 	Industry	3
Trailblazer	Gale Avenue/Fullerton Road <ul style="list-style-type: none"> ▪ NB Fullerton Road south of Gale Avenue ▪ EB Gale Avenue west of Fullerton Road ▪ WB Gale Avenue east of Fullerton Road 	Industry	3
Trailblazer	Gale Avenue/Walnut Avenue/Nogales Street <ul style="list-style-type: none"> ▪ NB Nogales Street south of Gale Avenue ▪ EB Gale Avenue west of Nogales Street ▪ WB Gale Avenue east of Nogales Street 	Industry	3
Trailblazer	Walnut Avenue/Fairway Drive <ul style="list-style-type: none"> ▪ NB Fairway Drive south of Walnut Avenue ▪ EB Walnut Avenue west of Azusa Avenue 	Industry	3
CCTV Camera	Valley Boulevard / Fairway Drive	Industry	4
CCTV Camera	Valley Boulevard / Azusa Way	Industry	5

Table 13 - Summary of Industry Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		
	Capital	Annual O&M ¹	Capital	Annual O&M							
Preliminary Opinions of Cost for ATMS Implementation											
Integration with field communications and central modems ¹	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 52,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ²	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual hardware and software maintenance	\$ -	\$ 3,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 64,000	\$ 3,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs											
Estimated Capital Cost for SBC installation	\$ 20,181	\$ -	\$ -	\$ -	\$ 2,534	\$ -	\$ 1,267	\$ -	\$ 1,267	\$ -	\$ -
Data Interface Field Equipment	\$ 24,700	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ³	\$ 117,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 34,656	\$ -	\$ -	\$ -	\$ 4,224	\$ -	\$ 2,112	\$ -	\$ 2,112	\$ -
Subtotal	\$ 161,881	\$ 34,656	\$ -	\$ -	\$ 2,534	\$ 4,224	\$ 1,267	\$ 2,112	\$ 1,267	\$ 2,112	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)	\$ 8,000	\$ 400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication⁴	\$ -	\$ -	\$ 35,534	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment											
CCTV (capital and annual maintenance)	\$ 90,000	\$ 4,500	\$ -	\$ -	\$ 60,000	\$ 3,000	\$ 30,000	\$ 1,500	\$ 30,000	\$ 1,500	\$ -
Controller and Cabinet Upgrades	\$ 25,875	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers (capital and annual maintenance)	\$ -	\$ -	\$ -	\$ -	\$ 32,000	\$ 1,600	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 115,875	\$ 4,500	\$ -	\$ -	\$ 92,000	\$ 4,600	\$ 30,000	\$ 1,500	\$ 30,000	\$ 1,500	\$ -
Grand total	\$ 349,756	\$ 43,356	\$ 35,534	\$ 4,800	\$ 94,534	\$ 8,824	\$ 31,267	\$ 3,612	\$ 31,267	\$ 3,612	\$ -

Notes

¹ Costs include one modem per phone drop and integration with field communications

² Assumes that LA County's purchase of the new ATMS covers license for all signals; capital costs include only additional equipment for Industry communications, modems, and integration of signals

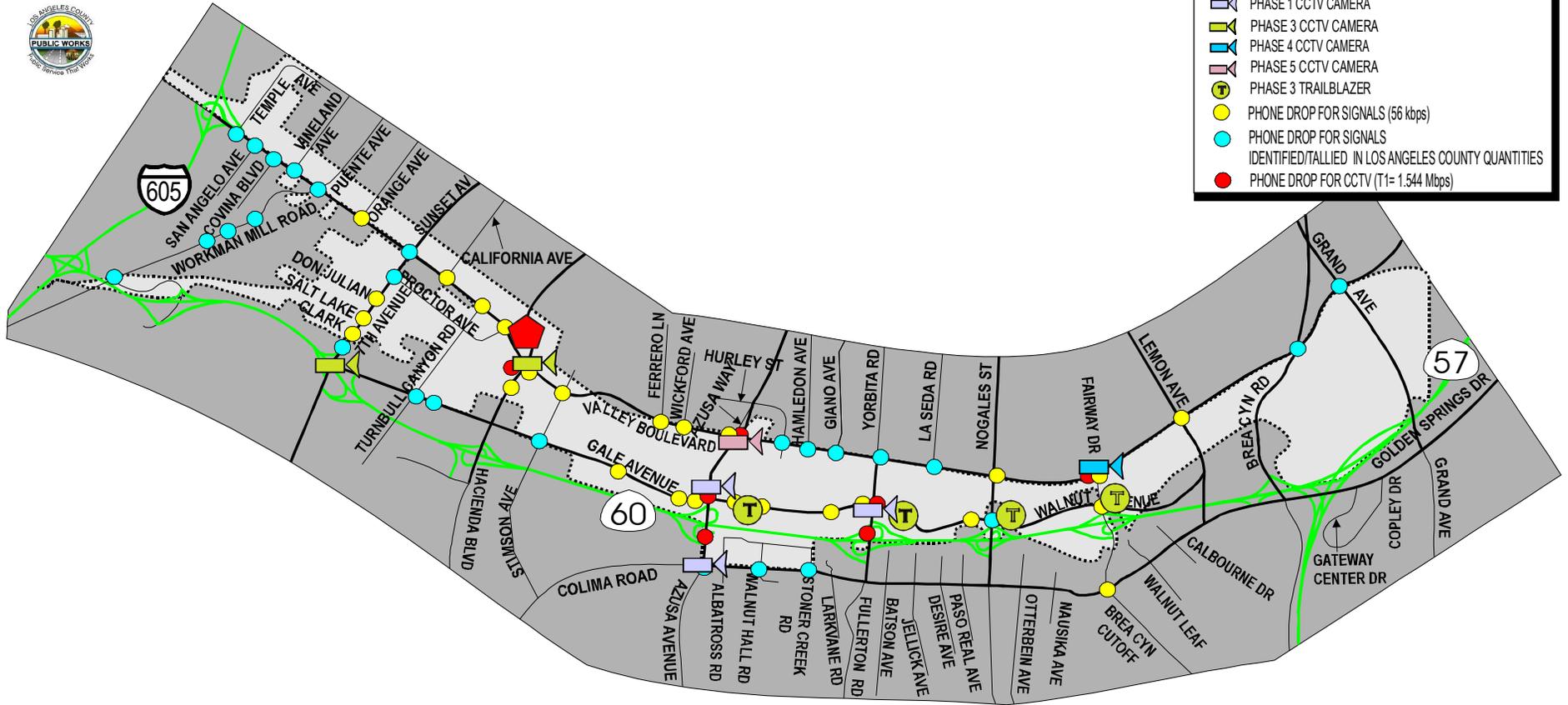
³ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁴ The first ten years of signal lease costs and the the first five years of CCTV camera lease costs will be funded by the existing program budget.

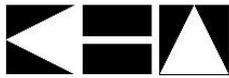


LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- CITY LIMITS
- FREEWAYS
- ◆ LCC
- ▶ PHASE 1 CCTV CAMERA
- ▶ PHASE 3 CCTV CAMERA
- ▶ PHASE 4 CCTV CAMERA
- ▶ PHASE 5 CCTV CAMERA
- Ⓣ PHASE 3 TRAILBLAZER
- PHONE DROP FOR SIGNALS (56 kbps)
- PHONE DROP FOR SIGNALS IDENTIFIED/TALLIED IN LOS ANGELES COUNTY QUANTITIES
- PHONE DROP FOR CCTV (T1= 1.544 Mbps)



**FIGURE 15 -
CITY OF INDUSTRY - CONCEPT DESIGN**



4.4 City of La Verne

The City of La Verne Maintenance Facility is located at 2620 First Street. The La Verne LCC is proposed to be located in the office of the Maintenance Operations Superintendent. The office currently has capabilities to be locked if desired and currently has security surveillance for entry and smoke/fire.

The proposed City of La Verne LCC would include an ATMS workstation and an IEN workstation with one monitor per workstation. A new desk is proposed to be provided for the workstations. **Figure 16** depicts the layout of the office space and City of La Verne LCC. The LCC is not proposed to have a dedicated video wall for CCTV monitoring, but will use the ATMS and IEN workstations for control and video. A rack will be installed to contain traffic signal and CCTV camera controller and communication equipment. Space is available for a 19-inch rack. The City does not intend to regularly staff the LCC, but rather, would utilize the tools provided in the LCC as needed to monitor traffic, change traffic signal timing, and coordinate special events. Location of the workstations in the Maintenance Operations Superintendent's office would provide the direct accessibility desired for regular use of the system. Equipment to be located at the LCC in City of La Verne is summarized as follows:

Equipment	Quantity
ATMS workstation (computer)	1
IEN workstation (computer)	1
Monitor (one monitor per workstation listed above)	2
19" equipment rack to contain traffic signal and CCTV control and monitoring equipment including:	1
ATMS server (computer that runs the proposed ATMS)	1
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems)	1
Modems for communication with traffic signals (9 phone drops [56 kbps] will be required to communicate with 11 traffic signals on regionally significant arterials)	9
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with four CCTV cameras at full-build-out)	1
IEN site server (to enable La Verne to connect to the IEN for data exchange with other agencies)	1

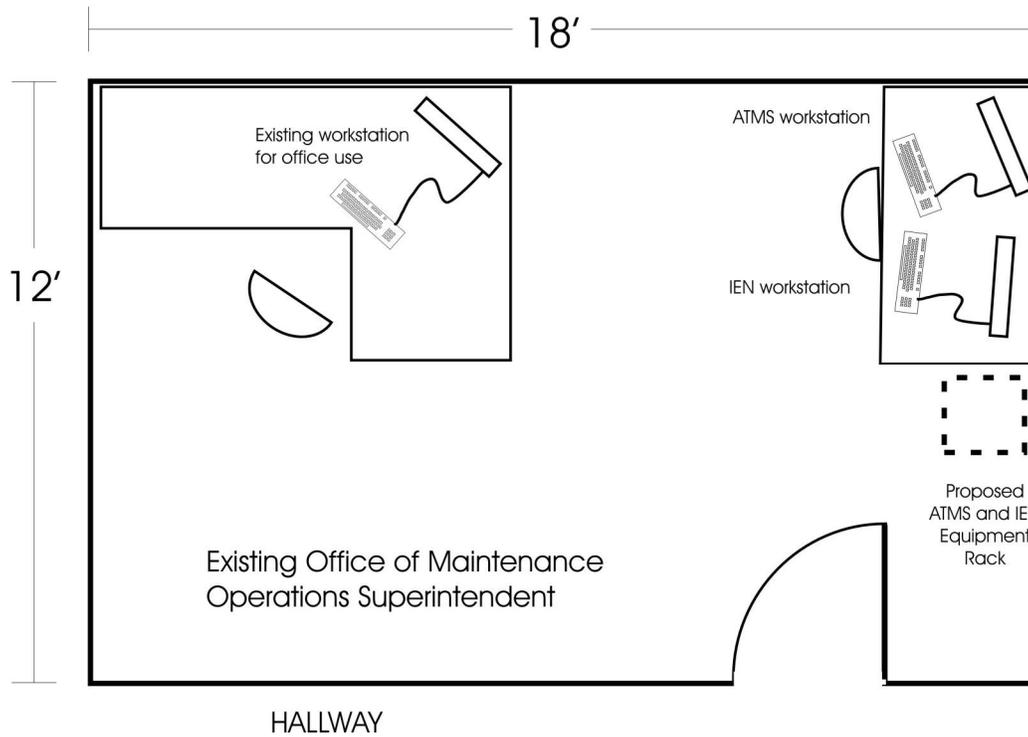
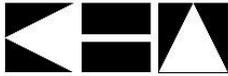


Figure 16 – City of La Verne LCC Layout

A summary of the field equipment that is proposed to be installed in the City of La Verne is summarized in **Table 14** and depicted in **Figure 17**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of the preliminary opinions of cost is presented in **Table 15**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of an 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 14 – Summary of La Verne Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
11 Traffic Signals to be connected to ATMS (9 lease line 56 kbps phone drops)			1
CCTV Camera	Arrow Hwy/White Avenue	La Verne	1
DMS (for Fairplex)	White Avenue North of Bonita Avenue (serving southbound traffic)	La Verne	3
DMS (for Fairplex)	Arrow Highway West of Wheeler Avenue (serving eastbound traffic)	La Verne	3
CCTV Camera	Foothill Blvd./ Wheeler Avenue	Caltrans	4
CCTV Camera	Foothill Blvd./ White Ave./ Fruit St.	Caltrans	5
CCTV Camera	Foothill Blvd./ Wheeler Avenue	Caltrans	5

Table 15 - Summary of La Verne Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	
Preliminary Opinions of Cost for ATMS Implementation											
Integration with field communications and central modems ¹	\$ 36,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 14,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ²	\$ 155,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual hardware and software maintenance	\$ -	\$ 3,050	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 205,000	\$ 3,050	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs											
Estimated Capital Cost for SBC installation	\$ 8,197	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,267	\$ -	\$ 2,534	\$ -	\$ -
Data Interface Field Equipment	\$ 10,450	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ³	\$ 49,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 7,709	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,112	\$ -	\$ 4,224	\$ -
Subtotal	\$ 68,147	\$ 7,709	\$ -	\$ -	\$ -	\$ -	\$ 1,267	\$ 2,112	\$ 2,534	\$ 4,224	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)											
	\$ 8,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication											
	\$ -	\$ -	\$ 34,267	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment											
CCTV	\$ 30,000	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ 60,000	\$ 3,000	\$ -
Controller and Cabinet Upgrades	\$ 25,875	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers	\$ -	\$ -	\$ -	\$ -	\$ 150,000	\$ 7,500	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 55,875	\$ 1,500	\$ -	\$ -	\$ 150,000	\$ 7,500	\$ 30,000	\$ 1,500	\$ 60,000	\$ 3,000	\$ -
Grand total	\$ 337,022	\$ 12,259	\$ 34,267	\$ 4,800	\$ 150,000	\$ 7,500	\$ 31,267	\$ 3,612	\$ 62,534	\$ 7,224	\$ -

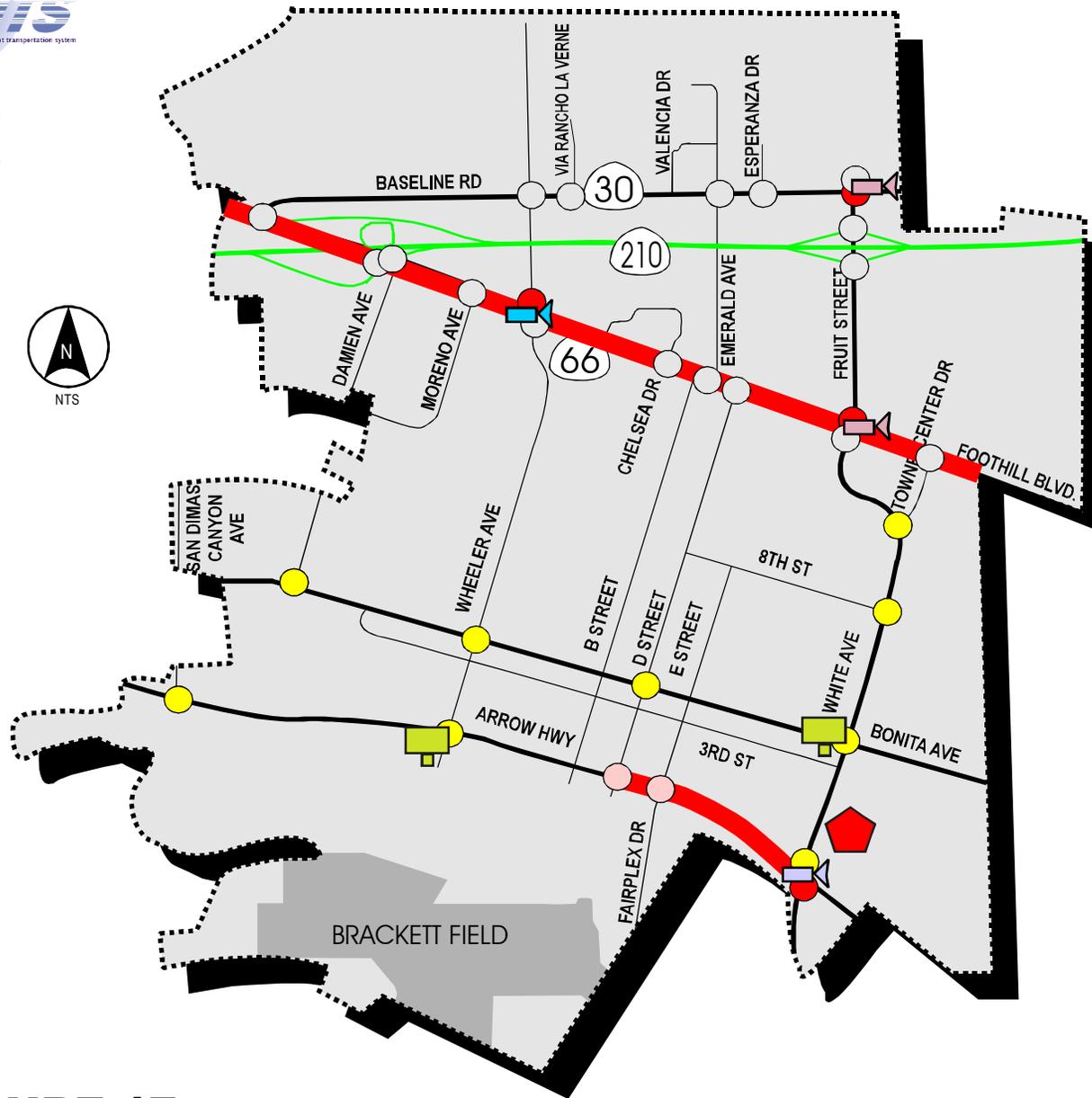
Notes

¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁴ The first ten years of signal lease costs and the first five years of CCTV camera lease costs will be funded by the existing program budget.



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAY
- CITY LIMITS
- LCC
- PHASE 1 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- PHASE 3 DMS
- PHONE DROP FOR CCTV
- PHONE DROP FOR SIGNALS
- SIGNAL WITHOUT PHONE DROP
- CALTRANS SIGNAL - NO CONNECTION
- EXISTING INTERCONNECT

**FIGURE 17 -
 CITY OF LA VERNE - CONCEPT DESIGN**



4.5 Los Angeles County

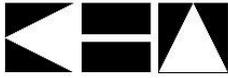
The County of Los Angeles recently completed construction of a new TMC. The approximate 7,300 square foot TMC (including a control room, conference room, office space, and video wall equipment) is located in the County annex building in Alhambra, which is approximately 20 miles from the Pomona Valley Forum. The Los Angeles County TMC has fifteen workstations.

Los Angeles County is proposed to monitor and control its traffic signals that are in unincorporated county areas within the Pomona Valley from this location. Additionally, it is intended that Los Angeles County will expand its current maintenance contracts with the Cities of Walnut and Industry to include not only the maintenance but also the monitoring/operations of traffic signals on behalf of those agencies via the County’s new ATMS.

Funding for two workstations for the new Los Angeles County TMC is proposed to come from the Pomona Valley Forum. Additionally, though the County’s new ATMS will be funded under another Los Angeles County project, it is anticipated that there will be a cost to populate the database of the new ATMS with data for traffic signals owned by Los Angeles County that are within the Pomona Valley area and for those signals owned by Industry and Walnut.

Equipment proposed to be located at the Los Angeles County TMC (in Alhambra) is summarized as follows:

Equipment	Quantity
ATMS workstations (computers) for monitoring/operations of County, Industry, and Walnut traffic signals in the Pomona Valley Forum area	2
IEN workstations (computers) for monitoring/operations of County, Industry, and Walnut traffic signals in the Pomona Valley Forum area	2
Monitors for workstations (one monitor per workstation above)	4
19” equipment racks to contain traffic signal and CCTV control and monitoring equipment including:	2
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems) – allowing connection of County traffic signals to County’s new ATMS in Alhambra	1
Modems for communication with LA County traffic signals (53 phone drops will be required to communicate with 60 Los Angeles County traffic signals on regionally significant arterials)	53
Modems for communication with Industry traffic signals (26 phone drops will be required to communicate with 26 Industry traffic signals on regionally significant arterials)	26
Modems for communication with Walnut traffic signals (16 phone drops will be required to communicate with 15 Walnut traffic signals on regionally significant arterials)	15
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with CCTV cameras)	1



A summary of the field equipment proposed to be installed in the unincorporated County area within the Pomona Valley Forum is summarized in **Table 16** and depicted in **Figure 18**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of Los Angeles County preliminary opinions of cost is presented in **Table 17**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of a 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

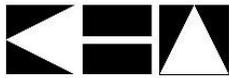


Table 16 – Summary of Los Angeles County Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
60 Traffic Signals to be connected to ATMS (53 lease line 56 kbps phone drops)			1
CCTV Camera	Nogales Street / Colima Road	LA County	1
CCTV Camera	Hacienda Boulevard / Gale Avenue	LA County	1
CCTV Camera	Fullerton Road / Colima Road	LA County	1
CCTV Camera	Nogales Street / Gale Avenue / Walnut Drive	Industry / LA County	1
Trailblazer	Azusa Avenue/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Azusa Avenue ▪ WB Colima Road east of Azusa Avenue ▪ SB Azusa Avenue north of Colima Road 	Industry/LA County	3
Trailblazer	Fullerton Road/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Fullerton Road ▪ WB Colima Road east of Fullerton Road ▪ SB Fullerton Road north of Colima Road 	LA County	3
Trailblazer	Nogales Street/Colima Road: <ul style="list-style-type: none"> ▪ EB Colima Road west of Nogales Street ▪ WB Colima Road east of Nogales Street ▪ SB Nogales Street north of Colima Road 	LA County	3
Trailblazer	Colima Road/Brea Canyon Cutoff/Fairway Drive: <ul style="list-style-type: none"> ▪ EB Colima Road west of Fairway Drive ▪ SB Fairway Drive north of Colima Road 	LA County	3
CCTV Camera	Valley Blvd @ Temple/I-605 ramps	LA County	3
CCTV Camera	Valley Boulevard / Workman Mill Road/Puente Ave	Industry / LA County	3
CCTV Camera	Hacienda Boulevard/ Colima Road	LA County	3
CCTV Camera	Valley Blvd @ Sunset/7th Avenue	LA County	3
CCTV Camera	Colima Road/ Stoner Creek Road	Industry / LA County	3
CCTV Camera	Valley Boulevard / Fullerton Road	Industry / LA County	4
CCTV Camera	Hacienda Boulevard/ Haliburton Road	LA County	4
CCTV Camera	Colima Road/ Haliburton Road	LA County	4
CCTV Camera	Colima Road / Brea Canyon Cutoff / Fairway Drive	LA County	4
CCTV Camera	Amar Road @ Nogales St	LA County	4
CCTV Camera	Valley Blvd / Grand Avenue	Industry / LA County	5
CCTV Camera	Valley Blvd @ Brea Canyon Road	LA County	5
CCTV Camera	Fairway Road / Walnut Drive	Industry / LA County	5

Table 17 - Summary of Los Angeles County Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	
Preliminary Opinions of Cost for ATMS Implementation											
Integration with field communications and central modems ¹	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 120,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ^{2,3}	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual ATMS hardware and software maintenance	\$ -	\$ 5,150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 132,000	\$ 5,150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs											
Estimated Capital Cost for SBC installation	\$ 38,458	\$ -	\$ -	\$ -	\$ 6,335	\$ -	\$ 6,335	\$ -	\$ 3,801	\$ -	\$ -
Data Interface Field Equipment	\$ 50,350	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ⁴	\$ 238,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 34,397	\$ -	\$ -	\$ -	\$ 10,560	\$ -	\$ 10,560	\$ -	\$ 6,336	\$ -
Subtotal	\$ 327,308	\$ 34,397	\$ -	\$ -	\$ 6,335	\$ 10,560	\$ 6,335	\$ 10,560	\$ 3,801	\$ 6,336	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication^{5,6}	\$ -	\$ -	\$ 2,534	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment											
CCTV	\$ 120,000	\$ 6,000	\$ -	\$ -	\$ 150,000	\$ 7,500	\$ 150,000	\$ 7,500	\$ 90,000	\$ 45,000	\$ -
Controller and Cabinet Upgrades	\$ 47,625	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers	\$ -	\$ -	\$ -	\$ -	\$ 32,000	\$ 1,600	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 167,625	\$ 6,000	\$ -	\$ -	\$ 182,000	\$ 9,100	\$ 150,000	\$ 7,500	\$ 90,000	\$ 45,000	\$ -
Grand total	\$ 636,933	\$ 45,547	\$ 2,534	\$ -	\$ 188,335	\$ 19,660	\$ 156,335	\$ 18,060	\$ 93,801	\$ 51,336	\$ -

Notes

¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

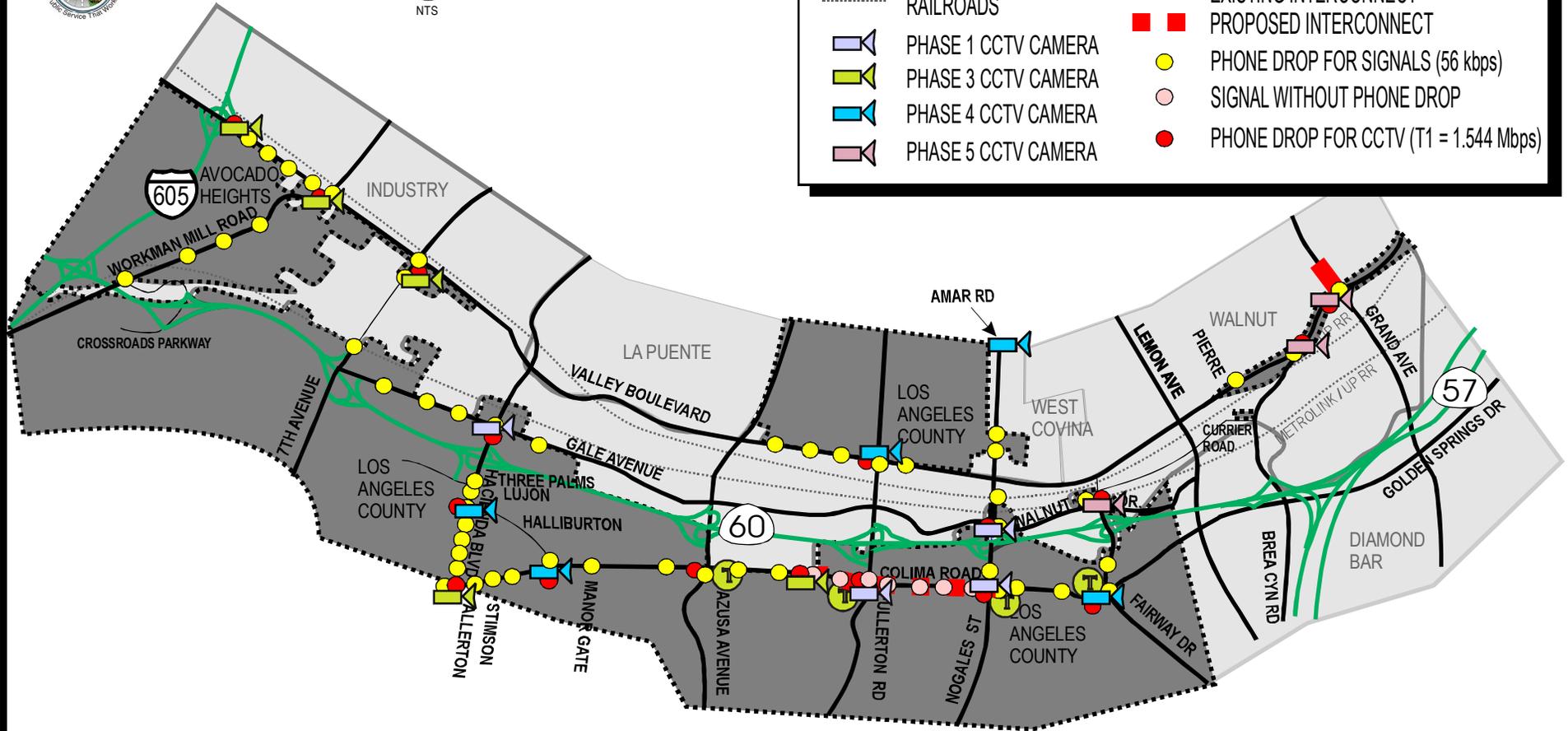
³ Assumes that LA County's purchase of the new ATMS covers license for all signals; capital costs include only additional equipment for County for communications, modems, and integration of signals

⁴ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

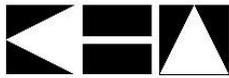
⁵ Majority of construction costs will be incurred under a different LA County program

⁶ Costs for LA County TMC IEN installation will be incurred under a different LA County program

⁷ The first ten years of signal lease costs and the first five years of CCTV camera lease costs will be funded by the existing program budget.



**FIGURE 18 -
LOS ANGELES COUNTY - CONCEPT DESIGN**

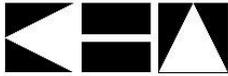


4.6 City of Pomona

The City of Pomona City Hall is located at 505 South Garey Avenue. The traffic engineering staff is located at City Hall. The City LCC is proposed to be located at the City Transit Center located at 1460 East Holt Avenue in order to accommodate computer and communications equipment necessary for traffic signals, CCTV camera, and other ITS elements.

The space available for use as the City's proposed LCC at the Transit Center is approximately 200 square feet and currently contains equipment for communications and operations of traffic signals and other ITS field devices associated with the ACE Construction Authority IR/RIS project. This equipment is operated by the City of Pomona on a daily, as-needed basis; no ACE staff is present in the LCC. The City currently operates a QuicNetIV traffic signal system to which approximately 80 signals are connected.

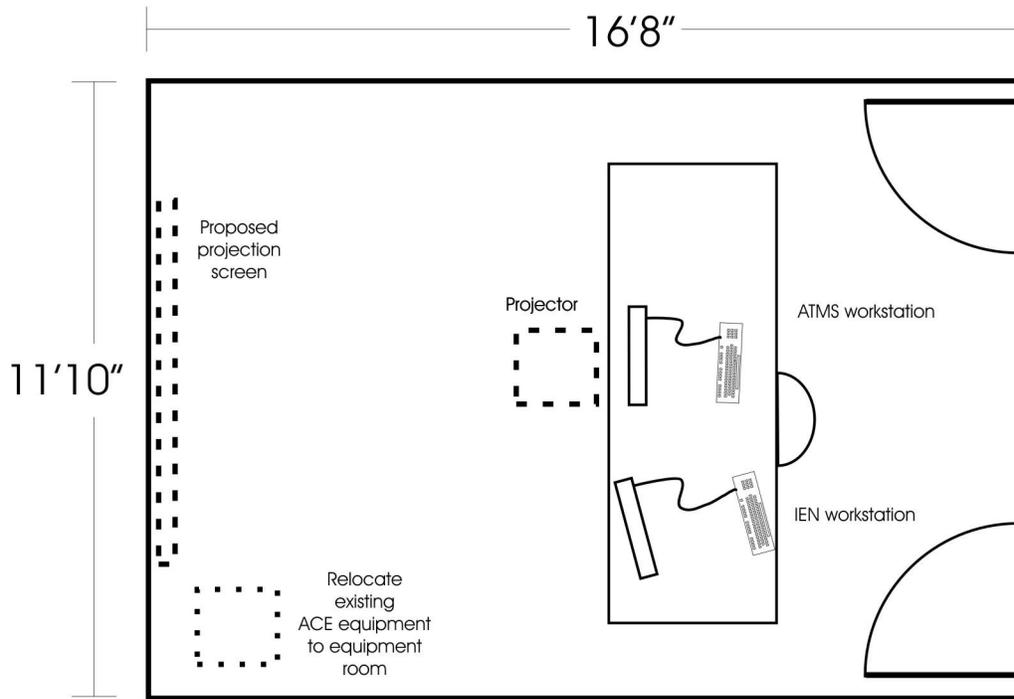
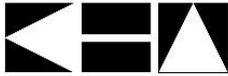
The City of Pomona LCC is proposed to include an ATMS workstation (existing) and an IEN workstation. Additionally, the City proposes an ATMS workstation at City Hall in the Traffic Engineer's office to provide more frequent access to the system on an as-needed basis. A small dedicated video wall for CCTV monitoring is recommended for installation in Phase 3. Two new 19-inch racks are proposed to be placed in the LCC or in an adjacent space to contain traffic signal and CCTV camera controller and communication equipment as a part of phase 1, when the traffic signals will be connected. **Figure 19** depicts the layout of the proposed City of Pomona LCC. Proposed equipment to be located at the LCC in the City of Pomona is summarized as follows:



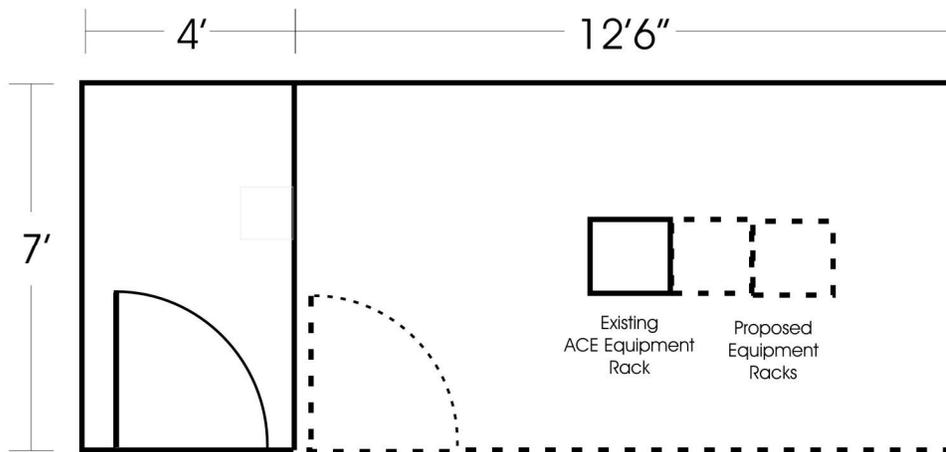
Equipment	Quantity
ATMS workstation (computer) at proposed LCC (Transit Center)	existing
IEN workstation (computer) at proposed LCC (Transit Center)	1
ATMS workstation (computer) at City Hall	1
Monitors (one monitor per workstation listed above)	2
Dedicated wall-mount video monitor for CCTV and ATMS viewing (phase 3)	1
19" equipment racks placed in proposed space at LCC to contain traffic signal and CCTV control and monitoring equipment including:	2
ATMS server (computer that runs the proposed ATMS)	existing
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems)	existing
modems for communication with traffic signals (43 phone drops will be required to communicate with 100 traffic signals on regionally significant arterials)	43
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with CCTV cameras)	existing
IEN site server (to enable Pomona to connect to the IEN for data exchange with other agencies)	1
Additional IEN monitoring-only workstations (with monitors) at:	
▪ City of Pomona Maintenance Yard (phase 3)	2
▪ Fairplex (for event management)	

The City does not intend to relocate staff to the LCC at the Transit Center, but does intend for staff to utilize the tools located there on a regular, daily basis (no particular schedule has been defined at this time). This, combined with the workstation located at City Hall will provide the City with ample access to the system for its optimum use.

No major modifications are anticipated to establish the LCC, with the possible exception of establishing a secure (air conditioned) space for the equipment if it is decided not to locate it in the control room itself. The proposed equipment room, just upstairs from the LCC, would require a wall and door to be built. This configuration is depicted in the figure below.



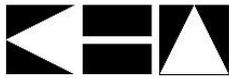
PROPOSED CONTROL ROOM



EXISTING PHONE ROOM

PROPOSED EQUIPMENT ROOM
(One floor above control room)

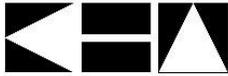
Figure 19 – City of Pomona LCC Layout



A summary of the field equipment proposed to be installed in the City of Pomona is summarized in **Table 18** and depicted in **Figure 20**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Existing interconnects and proposed leased communications necessary to connect with field equipment are depicted in **Figure 21**. Colors in the figure and table correspond to the proposed deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of Pomona preliminary opinions of cost is presented in **Table 19**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of an 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 18 – Summary of Pomona Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
100 Traffic Signals to be connected to ATMS (43 lease line 56 kbps phone drops)			1
DMS (for Fairplex)	Fairplex Drive North of I-10 ramps	Pomona	3
Trailblazer (for Fairplex)	White Avenue/McKinley Avenue: <ul style="list-style-type: none"> ▪ NB White Avenue south of McKinley Avenue ▪ WB McKinley Avenue east of White Avenue ▪ SB White Avenue north of McKinley Avenue 	Pomona	3
Trailblazer (for Fairplex)	La Verne Avenue/White Avenue: <ul style="list-style-type: none"> ▪ NB White Avenue south of La Verne Avenue ▪ SB White Avenue north of La Verne Avenue ▪ EB La Verne Avenue west of White Avenue ▪ WB La Verne Avenue east of White Avenue 	Pomona	3
Trailblazer (for Fairplex)	Fairplex Drive/McKinley Avenue: <ul style="list-style-type: none"> ▪ NB Fairplex Drive south of McKinley Avenue ▪ EB McKinley Avenue west of Fairplex Drive 	Pomona	3
Lane Control Signals	NB White Avenue between McKinley Avenue and La Verne Avenue	Pomona	3
CCTV Camera	Arrow/E St/Fairplex Drive	Pomona	3
Trailblazers (for Fairplex)	La Verne Avenue/Fairplex Drive: <ul style="list-style-type: none"> ▪ NB Fairplex Drive south of La Verne Avenue ▪ SB Fairplex Drive north of La Verne Avenue ▪ EB La Verne Avenue west of Fairplex Drive ▪ WB La Verne Avenue east of Fairplex Drive 	Pomona	4



Field Equipment	Intersection	Intersection Ownership	Deployment Phase
Trailblazers (for Fairplex)	Puddingstone Drive/Fairplex Drive: ▪ EB Puddingstone Drive west of Fairplex Drive	Pomona	4
Lane Control Signals	EB McKinley Avenue between Fairplex Drive and White Avenue	Pomona	4
CCTV Camera	Holt Avenue / Indian Hill Blvd.	Pomona	4
CCTV Camera	Temple Avenue / Valley Blvd.	Pomona	4
CCTV Camera	Mission Blvd. / White Avenue	Pomona	5
CCTV Camera	Mission Blvd. / Towne Avenue	Pomona	5
CCTV Camera	White Avenue / McKinley Avenue	Pomona	5
CCTV Camera	Mission Blvd. / Temple Avenue	Pomona / Diamond Bar	5
CCTV Camera	Fairplex Drive/ W.McKinley Avenue	Pomona	5
CCTV Camera	White Avenue at The Fairplex (Gate 17)	Pomona	5

Table 19 - Summary of Pomona Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5	
	Capital	Annual O&M ⁵	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M
Preliminary Opinions of Cost for ATMS Implementation										
Integration with field communications and central modems ¹	\$ 68,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 95,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ^{2, 3}	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual ATMS hardware and software maintenance	\$ -	\$ 4,650	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 163,000	\$ 4,650	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs										
Estimated Capital Cost for SBC installation	\$ 27,090	\$ -	\$ -	\$ -	\$ 1,267	\$ -	\$ 2,534	\$ -	\$ 7,602	\$ -
Data Interface Field Equipment	\$ 40,850	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ⁴	\$ 193,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 21,370	\$ -	\$ -	\$ -	\$ 2,112	\$ -	\$ 4,224	\$ -	\$ 12,672
Subtotal	\$ 261,440	\$ 21,370	\$ -	\$ -	\$ 1,267	\$ 2,112	\$ 2,534	\$ 4,224	\$ 7,602	\$ 12,672
Control Centers (includes operator workstation computers, furniture, racks, and construction)	\$ 53,000	\$ -	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication	\$ -	\$ -	\$ 68,534	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment										
CCTV	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ 60,000	\$ 3,000	\$ 180,000	\$ 9,000
Controller and Cabinet Upgrades	\$ 94,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers	\$ -	\$ -	\$ -	\$ -	\$ 167,000	\$ 8,350	\$ 60,000	\$ 3,000	\$ -	\$ -
Subtotal	\$ 94,500	\$ -	\$ -	\$ -	\$ 197,000	\$ 9,850	\$ 120,000	\$ 6,000	\$ 180,000	\$ 9,000
Grand total	\$ 571,940	\$ 26,020	\$ 68,534	\$ 4,800	\$ 248,267	\$ 11,962	\$ 122,534	\$ 10,224	\$ 187,602	\$ 21,672

Notes

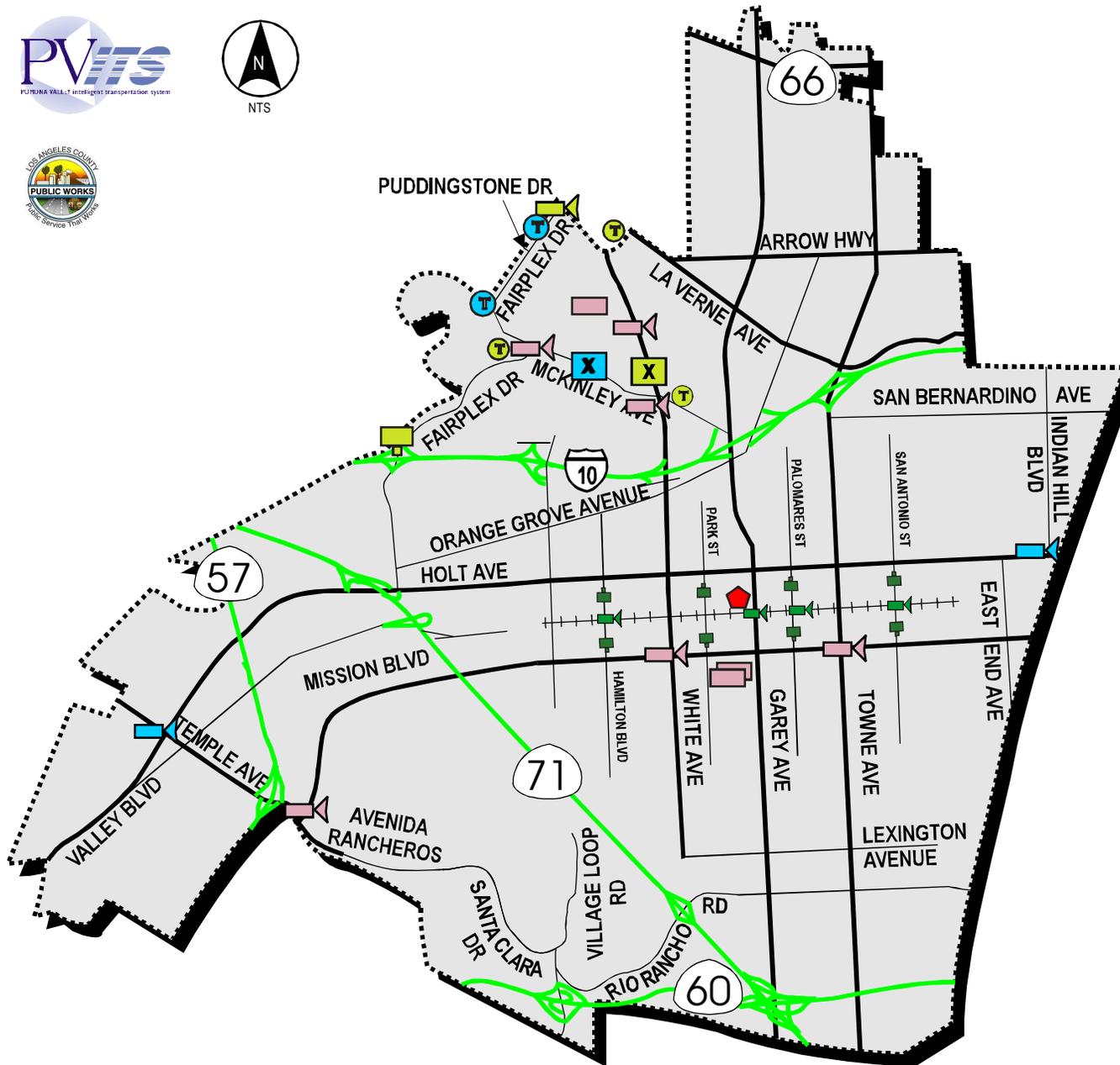
¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Pomona has a current license for QuicNet IV; assume no license fee is necessary; capital costs include modems and integration with field only

⁴ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁵ The first ten years of signal lease costs and the first five years of CCTV camera lease costs will be funded by the existing program budget.

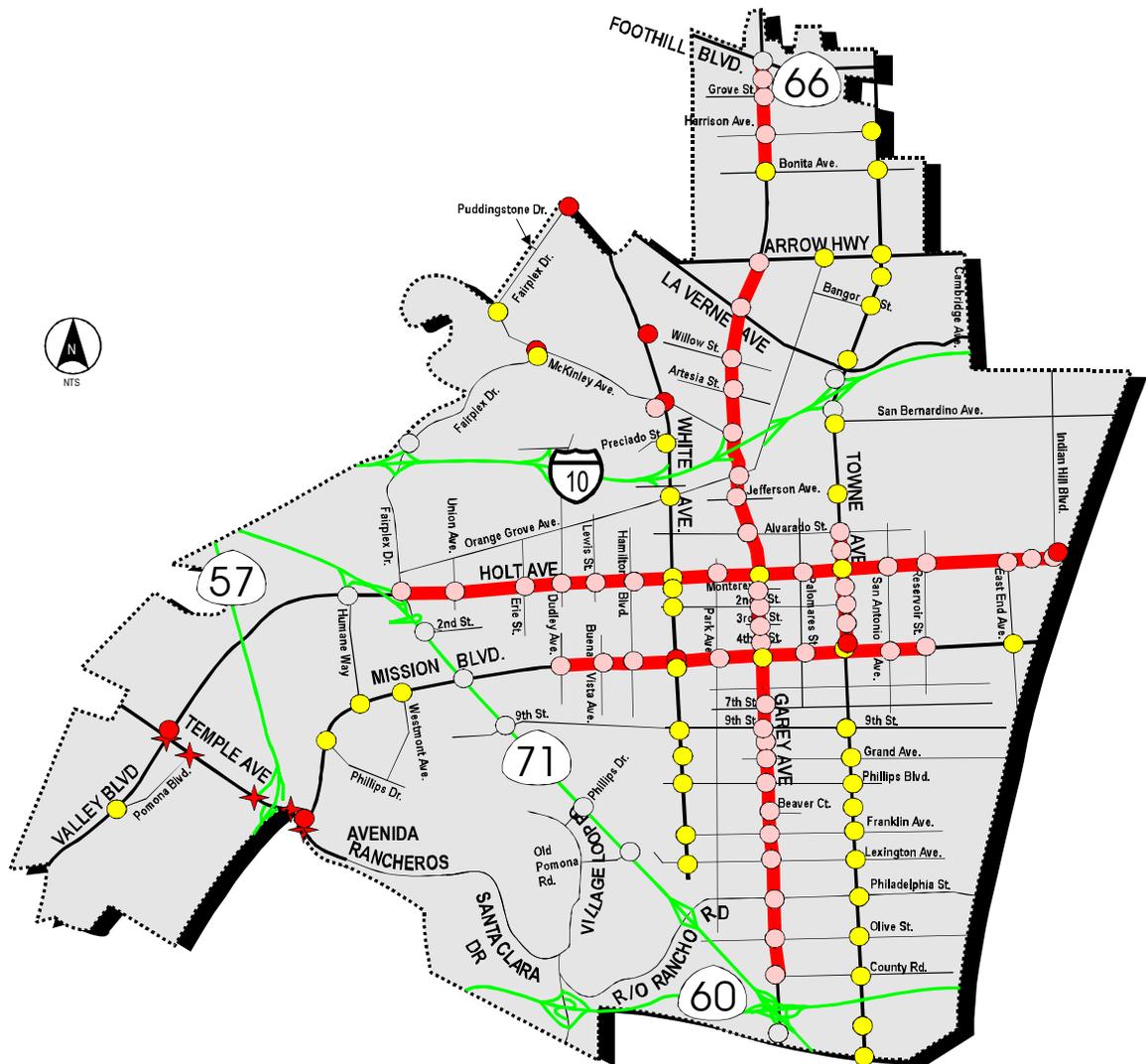


LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- CITY LIMITS
- LCC
- ADDITIONAL MONITORING WORKSTATIONS**
- PHASE 3 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- ACE PROPOSED CCTV CAMERA
- PHASE 3 DYNAMIC MESSAGE SIGN
- PHASE 3 TRAILBLAZER
- PHASE 4 TRAILBLAZER
- PHASE 3 LANE CONTROL SIGNALS
- PHASE 4 LANE CONTROL SIGNALS
- ACE PROPOSED DMS

* ADDITIONAL MONITORING-ONLY WORKSTATIONS AT:
 -MAINTENANCE YARD
 -CITY HALL ENGINEERING DEPARTMENT
 -FAIRPLEX

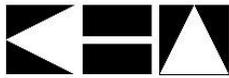
**FIGURE 20 -
 CITY OF POMONA - CONCEPT DESIGN**



LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- CITY LIMITS
- EXISTING INTERCONNECT (CONNECTED TO QuicNet)
- ACE PROPOSED FIBER
- PHONE DROP FOR SIGNALS (56 kbps)
- SIGNAL WITHOUT PHONE DROP
- EXISTING LEASED PHONE DROP FOR SIGNALS (56 kbps)
- PHONE DROP FOR CCTV (T1 = 1.544 Mbps)
- CALTRANS SIGNAL - NO CONNECTION

FIGURE 21 - CITY OF POMONA COMMUNICATION CONCEPT DESIGN



4.7 City of San Dimas

The City of San Dimas City Hall is located at 245 East Bonita Avenue. The City of San Dimas LCC is proposed to be located in a spare space in the public works department adjacent to the City Engineer’s office at City Hall. The area is currently being used as an office and there is a City PC and a Los Angeles County dedicated computer in the office. The dedicated Los Angeles County computer has access to a web site for the East San Gabriel Valley Traffic Signal Synchronization Operations and Maintenance Pilot Project and is proposed to become the IEN workstation. A new and separate workstation will be required for the ATMS operations. **Figure 22** depicts the layout of the office space and proposed City of San Dimas LCC.

The City does not desire a dedicated video wall for CCTV monitoring, but would use the ATMS and IEN workstations for control and monitoring. Under this scenario, a new 19-inch rack is proposed in the equipment room for traffic signal and CCTV camera controller and communication equipment. The City does not intend to staff the LCC, but its proposed location will allow staff to utilize the tools provided on a regular, as needed basis to monitor traffic, change traffic signal timing, and coordinate special events. Equipment to be located at the proposed LCC in the City of San Dimas is summarized as follows:

Equipment	Quantity
ATMS workstation (computer)	1
Monitors (one monitor per workstation listed above)	1
19” equipment racks placed in existing computer/equipment room to contain traffic signal and CCTV control and monitoring equipment including:	1
ATMS server (computer that runs the proposed ATMS)	1
ATMS communication server (computer that performs communications from ATMS to traffic signals via the use of modems)	1
modems for communication with traffic signals (30 phone drops will be required to communicate with 33 traffic signals on regionally significant arterials)	30
CCTV camera controller/communication equipment (vendor-provided equipment to control/communicate with CCTV cameras)	1
IEN site server (to enable San Dimas to connect to the IEN for data exchange with other agencies)	1
Additional IEN monitoring-only workstations (with monitors) at (phase 3):	
▪ City of San Dimas Maintenance Yard	3
▪ San Dimas Police Department	
▪ San Dimas Fire Department	

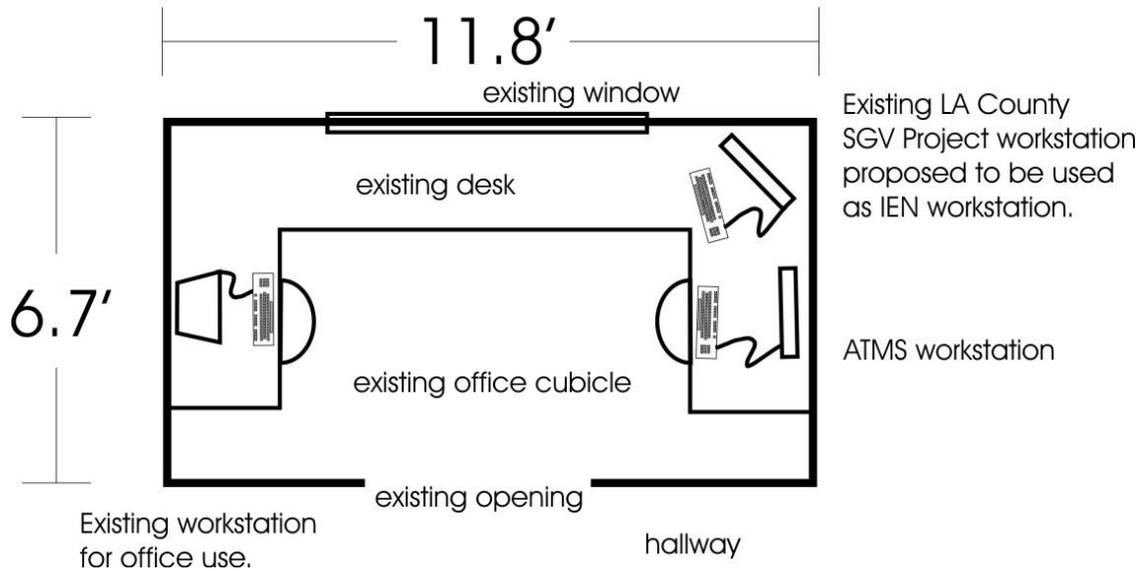
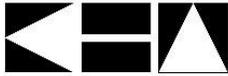


Figure 22 – City of San Dimas LCC Layout

A summary of the field equipment to be installed in the City of San Dimas is summarized in **Table 20** and depicted in **Figure 23**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of the San Dimas preliminary opinions of cost is presented in **Table 21**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of an 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 20 – Summary of San Dimas Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
33 Traffic Signals to be connected to ATMS (30 lease line 56 kbps phone drops)			1
CCTV Camera	Arrow Highway / Bonita Avenue / SR 57 NB ramps	San Dimas	1
CCTV Camera	Arrow Highway / Lone Hill Avenue	San Dimas	4
CCTV Camera	Foothill Boulevard / San Dimas Avenue	San Dimas	4
CCTV Camera	Arrow Highway / San Dimas Avenue	San Dimas	5
CCTV Camera	Via Verde/ San Dimas Avenue	San Dimas	5

Table 21 - Summary of San Dimas Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5	
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M
Preliminary Opinions of Cost for ATMS Implementation										
Integration with field communications and central modems ¹	\$ 55,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 33,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ²	\$ 155,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual ATMS hardware and software maintenance	\$ -	\$ 4,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 243,000	\$ 4,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs										
Estimated Capital Cost for SBC installation	\$ 20,167	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,534	\$ -	\$ 2,534	\$ -
Data Interface Field Equipment	\$ 28,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ³	\$ 135,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreements)	\$ -	\$ 17,376	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,224	\$ -	\$ 4,224
Subtotal	\$ 183,667	\$ 17,376	\$ -	\$ -	\$ -	\$ -	\$ 2,534	\$ 4,224	\$ 2,534	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)	\$ 8,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication	\$ -	\$ -	\$ 34,267	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment										
CCTV	\$ 30,000	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ 3,000	\$ 60,000	\$ 3,000
Controller and Cabinet Upgrades	\$ 24,375	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 54,375	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ 3,000	\$ 60,000	\$ 3,000
Grand total	\$ 489,042	\$ 22,876	\$ 34,267	\$ 4,800	\$ -	\$ -	\$ 62,534	\$ 7,224	\$ 62,534	\$ 3,000

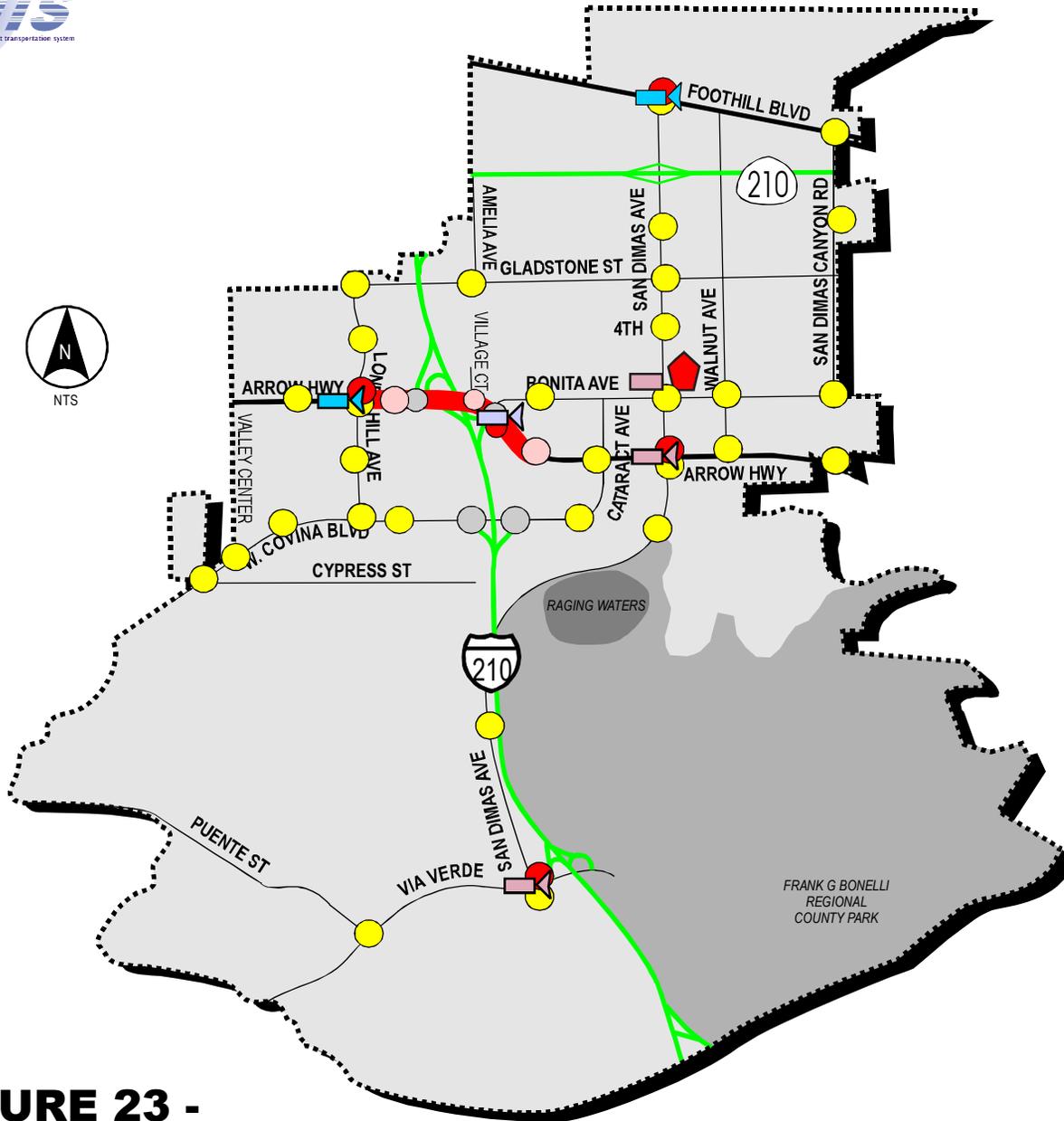
Notes

¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

⁴ The first ten years of signal lease costs and the first five years of CCTV camera lease costs will be funded by the existing program budget.

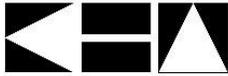


LEGEND

- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- FREEWAYS
- CITY LIMITS
- LCC
- ADDITIONAL MONITORING WORKSTATIONS*
- PHASE 1 CCTV CAMERA
- PHASE 4 CCTV CAMERA
- PHASE 5 CCTV CAMERA
- EXISTING INTERCONNECT
- PHONE DROP FOR SIGNALS (56 kbps)
- SIGNAL WITHOUT PHONE DROP
- PHONE DROP FOR CCTV (T1 = 1.544 Mbps)
- CALTRANS SIGNAL - NO CONNECTION

*ADDITIONAL MONITORING-ONLY WORKSTATIONS AT:
 -POLICE DEPARTMENT
 -FIRE DEPARTMENT
 -MAINTENANCE YARD

**FIGURE 23 -
 CITY OF SAN DIMAS - CONCEPT DESIGN**



4.8 City of Walnut

The City of Walnut is planning a new City Hall at 2101 La Puente Road. No detailed plans are available. A typical LLC, taking into consideration the City’s requirements, has been conceptually designed and is proposed for that location. Once detail on the location of the room is available, the design can be modified as required. Alternatively, an IEN workstation can be placed on an existing staff person’s desk or in another location in an existing staff person’s office if space is available.

Figure 24 depicts a sample layout of an LCC for Walnut.

The City of Walnut intends to expand their current agreement with Los Angeles County to not only maintain but also monitor/operate their traffic signals. As such, the proposed LCC would include an IEN workstation for monitoring. The IEN workstation also provides the capability for City staff to control their own traffic signals by uploading and downloading timing plans in the future if desired. The City does not desire a dedicated video wall for CCTV monitoring. It is proposed that all traffic signal and CCTV communication equipment (such as modems) be located at the County’s TMC in Alhambra to facilitate the County’s troubleshooting, operations, and maintenance responsibilities.

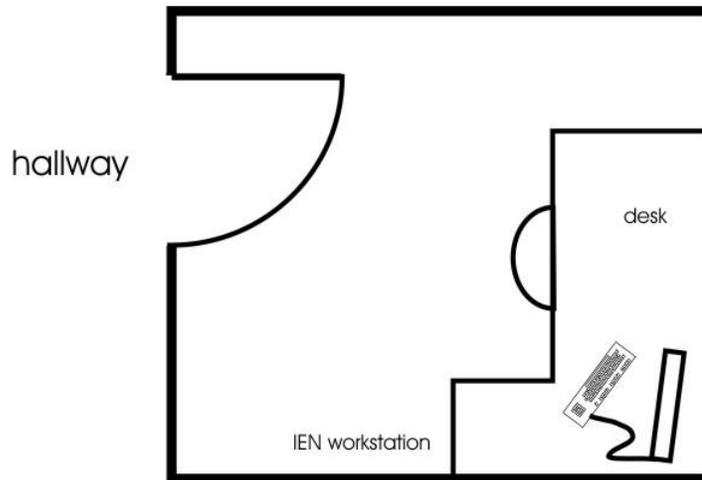
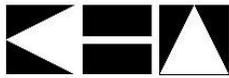


Figure 24 – Sample City of Walnut LCC Layout



Proposed equipment to be located at the proposed LCC in the City of Walnut is summarized as follows:

Equipment	Quantity
IEN workstation (computer) for monitoring	1
Monitor for workstation	1
IEN site server (to enable Walnut to connect to the IEN for data exchange with other agencies)	1

A summary of the field equipment to be installed in the City of Walnut is summarized in **Table 22** and depicted in **Figure 25**. Only the ITS components to be implemented on regionally significant arterials that provide mobility across the region are addressed in this report. Colors in the figure and table correspond to the deployment phases. CCTV cameras monitoring Caltrans intersections will be installed outside of Caltrans right-of-way. A summary of the Walnut preliminary opinions of cost is presented in **Table 23**. The signal controller upgrade estimates are based upon field review of existing controllers and the need to upgrade. An agency will need to replace the CPU board of a 170E controller to run LACO 4E. The hardware cost for the new QUAD UART HC-11 board is estimated at \$375 per board. Any controller that is not 170E needs to be changed out to the new County specified 170ATC, an estimated cost of \$1500 per controller.

Table 22 – Summary of Walnut Proposed Field Equipment

Field Equipment	Intersection	Intersection Ownership	Deployment Phase
16 Traffic Signals to be connected to ATMS (15 lease line 56 kbps phone drops)			1
CCTV Camera	Amar Road/Grand Avenue/Temple Avenue	Walnut	3

Table 23 - Summary of Walnut Preliminary Opinions of Cost

	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5	
	Capital	Annual O&M ¹	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M	Capital	Annual O&M
Preliminary Opinions of Cost for ATMS Implementation										
Integration with field communications and central modems ¹	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Database Configuration/ Population	\$ 32,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Average Capital Cost ^{2,3}	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual ATMS hardware and software maintenance	\$ -	\$ 3,300	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 44,000	\$ 3,300	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Opinions of Cost for Communication Lease Costs										
Estimated Capital Cost for SBC installation	\$ 10,080	\$ -	\$ -	\$ -	\$ 1,267	\$ -	\$ -	\$ -	\$ -	\$ -
Data Interface Field Equipment	\$ 15,200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Cost per Phone Drop of Conduit to Connect Closest Signal ⁴	\$ 72,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual operations for field equipment (includes lease costs and O&M agreement for signals by County)	\$ -	\$ 19,853	\$ -	\$ -	\$ -	\$ 2,112	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 97,280	\$ 19,853	\$ -	\$ -	\$ 1,267	\$ 2,112	\$ -	\$ -	\$ -	\$ -
Control Centers (includes operator workstation computers, furniture, racks, and construction)										
	\$ 3,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agency Integration/Center to Center Communication										
	\$ -	\$ -	\$ 35,534	\$ 4,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Field Equipment										
CCTV	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ -	\$ -	\$ -	\$ -
Controller and Cabinet Upgrades	\$ 24,375	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
DMS/Trailblazers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 24,375	\$ -	\$ -	\$ -	\$ 30,000	\$ 1,500	\$ -	\$ -	\$ -	\$ -
Grand total	\$ 168,655	\$ 23,153	\$ 35,534	\$ 4,800	\$ 31,267	\$ 3,612	\$ -	\$ -	\$ -	\$ -

Notes

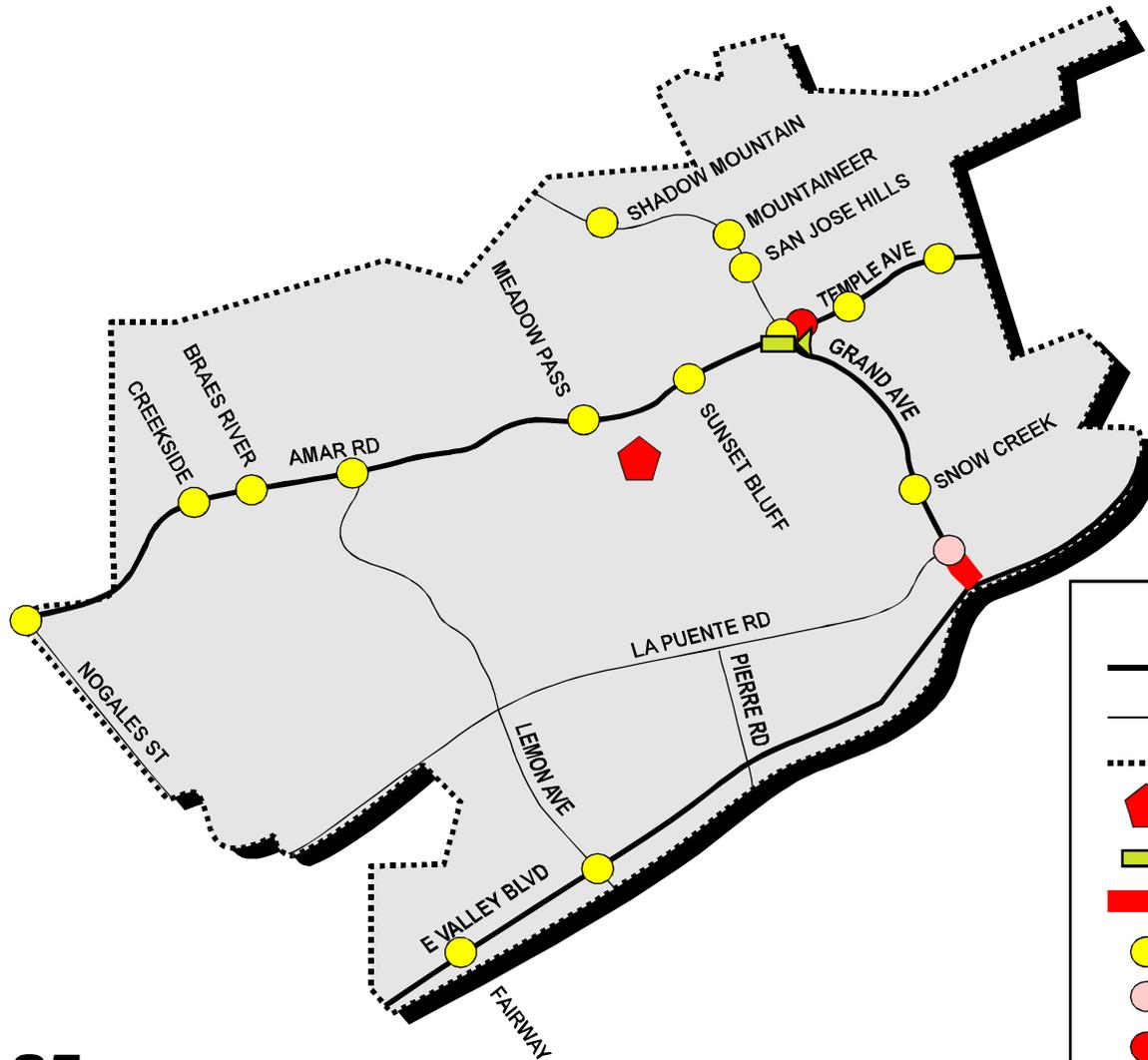
¹ Costs include one modem per phone drop and integration with field communications

² Costs include hardware, software license, system configuration, integration with LAN, training and documentation

³ Assumes that LA County's purchase of the new ATMS covers license for all signals; capital costs include only additional equipment for Walnut for communications, modems, and integration of signals

⁴ Assumes an average distance of 150 feet from cabinet to nearest phone drop at \$30/linear foot

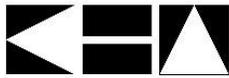
⁵ The first ten years of signal lease costs and the the first five years of CCTV camera lease costs will be funded by the existing program budget.



LEGEND

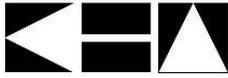
- REGIONALLY SIGNIFICANT ARTERIALS
- OTHER ROADWAYS
- CITY LIMITS
- LCC
- PHASE 3 CCTV CAMERA
- EXISTING INTERCONNECT
- PHONE DROP FOR SIGNALS (56 kbps)
- SIGNAL WITHOUT PHONE DROP
- PHONE DROP FOR CCTV (T1 = 1.544 Mbps)

**FIGURE 25 -
 CITY OF WALNUT - CONCEPT DESIGN**



APPENDIX A – LIST OF ACRONYMS

ACE	Alameda Corridor-East [Construction Authority]
AQMD	Air Quality Management District
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
Caltrans	California Department of Transportation
CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
IEN	Information Exchange Network
IR/RIS	Intelligent Roadway/Rail Interface System
ITS	Intelligent Transportation System
LA	Los Angeles
LACMTA	Los Angeles County Metropolitan Transportation Authority
LCC	Local Control Center
O&M	Operations and Maintenance
PC	Personal Computer
PVITS	Pomona Valley Intelligent Transportation System
TMC	Traffic Management Center



Kimley-Horn
and Associates, Inc.



APPENDIX B – CCTV EVALUATION

ID	Signalized Intersection	Ownership	Location	NB	SB	EB	WB	Approach Volume (ADT)	ADT Score	Incidents (one year period)	Incident Score	Resulting Rank	Construction Phase
14	Indian Hill Blvd./ San Jose	Caltrans	Claremont	16240	16240	0	9300	41800	1	12	3	4	1
42	Foothill Blvd./ Indian Hill Blvd.	Caltrans	Claremont	7982	8173	19731	20930	56800	3	1	1	4	4
12	Arrow Highway / Indian Hill Blvd.	Claremont	Claremont	10858	11593	14348	13462	50300	1	7	2	3	4
13	Indian Hill Blvd./ Bonita Avenue	Claremont	Claremont	10858	11593	14348	13462	50300	1	3	1	2	5
45	Baseline Road / Indian Hill Blvd.	Caltrans	Claremont	6200	6200	13703	15734	41800	1	0	0	1	5
58	Baseline Road / Mills Avenue	Caltrans	Claremont	5000	5000	21550	21550	53100	1	0	0	1	5
4	Golden Springs Drive / Grand Avenue	Diamond Bar	Diamond Bar	15284	8692	17512	17665	59200	3	18	4	7	1
5	Grand Avenue / Diamond Bar Blvd.	Diamond Bar	Diamond Bar	16062	10828	14092	18147	59100	3	18	4	7	1
26	Diamond Bar Blvd. / Golden Springs Drive	Diamond Bar	Diamond Bar	8000	8000	5268	5268	26500	0	25	5	5	1
3	Diamond Bar Blvd. / Pathfinder Road	Diamond Bar	Diamond Bar	15619	15619	10344	10344	51900	1	8	2	3	1
16	Brea Canyon Road / Golden Springs Drive	Diamond Bar	Diamond Bar	7376	7376	10216	10216	35200	0	10	2	2	1
27	Golden Springs Drive / Lemon Avenue	Diamond Bar	Diamond Bar	10658	9759	10125	10125	40700	1	5	1	2	1
46	Pathfinder Road / Brea Canyon Rd. / Fern Hollow	Diamond Bar	Diamond Bar	8501	9003	10344	10344	38200	0	18	4	4	4
15	Brea Canyon Road / Diamond Bar Blvd.	Diamond Bar	Diamond Bar	4170	4170	15619	15619	39600	0	9	2	2	5
11	Azusa Avenue / Gale Avenue	Industry	Industry	27028	27544	14414	13687	82700	5	9	2	7	1
17	Gale Avenue / Fullerton Road	Industry	Industry	16360	19105	9130	8935	53500	1	4	1	2	1
9	Gale Avenue / Seventh Street	Industry	Industry	16002	17827	8203	17940	60000	3	11	3	6	3
50	Valley Boulevard / Hacienda Boulevard	Industry	Industry	21532	24325	18496	19933	84300	5	1	1	6	3
49	Valley Boulevard / Fairway Drive	Industry / Walnut	Industry	21482	0	14155	15277	50900	1	12	3	4	4
43	Valley Boulevard / Azusa Way	Industry / La Puente	Industry	5015	5065	15788	15114	41000	1	1	1	2	5
48	Nogales Street / Colima Road	LA County	LA County	18586	20106	18824	22207	79700	5	12	3	8	1
6	Hacienda Boulevard / Gale Avenue	LA County	LA County	20129	19718	15414	18228	73500	5	10	2	7	1
25	Fullerton Road / Colima Road	LA County	LA County	19538	16658	18479	20772	75400	5	7	2	7	1
35	Nogales Street / Gale Avenue / Walnut Drive	Industry / LA County	LA County	21420	21213	8315	9718	60700	3	16	4	7	1
23	Colima Road / Azusa Avenue	Industry / LA County	LA County	5641	6276	22849	24463	59200	3	13	3	6	1
63	Valley Blvd @ Temple/I-605 ramps	LA County	LA County	13076	15344	28252	27706	84400	5	8	2	7	3
51	Valley Boulevard / Workman Mill Road/Puente Ave	Industry / LA County	LA County	11995	11773	21044	22785	67600	3	12	3	6	3
61	Hacienda Boulevard/ Colima Road	LA County	LA County	18467	9981	17784	15267	61500	3	15	3	6	3
64	Valley Blvd @ Sunset/7th Avenue	LA County	LA County	12000	12341	18000	17628	60000	3	15	3	6	3
59	Colima Road/ Stoner Creek Road	Industry / LA County	LA County	17750	17750	16639	18000	70100	5	0	0	5	3
10	Valley Boulevard / Fullerton Road	Industry / LA County	LA County	9833	10098	19367	18069	57400	3	3	1	4	4
60	Hacienda Boulevard/ Haliburton Road	LA County	LA County	21054	21240	8010	8174	58500	3	2	1	4	4
62	Colima Road/ Haliburton Road	LA County	LA County	7789	6757	19264	22310	56100	3	5	1	4	4
47	Colima Road / Brea Canyon Cutoff / Fairway Drive	LA County	LA County	8475	9861	11590	10826	40800	1	6	2	3	4
67	Amar Road @ Nogales St	LA County	LA County	10685	0	13336	17134	41200	1	7	2	3	4
8	Valley Blvd / Grand Avenue	Industry / LA County	LA County	15997	13357	8953	9517	47800	1	4	1	2	5
65	Valley Blvd @ Brea Canyon Road	LA County	LA County	7281	0	13000	13688	34000	0	8	2	2	5
34	Fairway Road / Walnut Drive	Industry / LA County	LA County	14546	14753	1263	1211	31800	0	4	1	1	5
33	Arrow Hwy / White Ave.	La Verne	La Verne	14665	17604	13957	12648	58900	3	1	1	4	1
53	Foothill Blvd./ Wheeler Avenue	Caltrans	La Verne	8181	9414	13000	13281	43900	1	8	2	3	4
32	Baseline Road/ Fruit Street	La Verne - Future Signal	La Verne	10000	10000	12912	12844	45800	1	1	1	2	5
44	Foothill Blvd./ White Ave./ Fruit St.	Caltrans	La Verne	6480	6480	13000	13000	39000	0	7	2	2	5
20	Arrow/E St/Fairplex Drive	Pomona	Pomona	22116	22095	17653	9884	71700	5	0	0	5	3
52	Holt Avenue / Indian Hill Blvd.	Pomona	Pomona	10858	11593	14470	14397	51300	1	11	3	4	4
24	Temple Avenue / Valley Blvd.	Pomona	Pomona	13316	13316	9517	8953	45100	1	8	2	3	4
30	Mission Blvd. / White Avenue	Pomona	Pomona	4525	4959	12665	12334	34500	0	7	2	2	5
36	Mission Blvd. / Towne Avenue	Pomona	Pomona	4239	3265	12768	13445	33700	0	10	2	2	5
1	White Avenue / McKinley Avenue	Pomona	Pomona	8211	8484	3516	2467	22700	0	3	1	1	5

ID	Signalized Intersection	Ownership	Location	NB	SB	EB	WB	Approach Volume (ADT)	ADT Score	Incidents (one year period)	Incident Score	Resulting Rank	Construction Phase
37	Mission Blvd. / Temple Avenue	Pomona / Diamond Bar	Pomona	7414	7630	6475	6998	28500	0	4	1	1	5
39	Fairplex Drive/ W.McKinley Avenue	Pomona	Pomona	5639	4533	4043	4365	18600	0	2	1	1	5
21	White Avenue at The Fairplex (Gate 17)	Pomona	Pomona	8808	8565	7984	6527	31900	0	0	0	0	5
19	Arrow Highway / Bonita Avenue / SR 57 NB ramps	San Dimas	San Dimas	10100	17950	11700	8500	48300	1	8	2	3	1
31	Arrow Highway / Lone Hill Avenue	San Dimas	San Dimas	6908	10408	12302	16115	45700	1	12	3	4	4
38	Foothill Boulevard / San Dimas Avenue	San Dimas	San Dimas	6140	6140	22265	22265	56800	3	4	1	4	4
40	Arrow Highway / San Dimas Avenue	San Dimas	San Dimas	4133	4133	13417	13417	35100	0	8	2	2	5
41	Via Verde/ San Dimas Avenue	San Dimas	San Dimas	7050	7050	4000	3965	22100	0	3	1	1	5
7	Amar Road/ Grand Avenue/ Temple Avenue	Walnut	Walnut	18439	20490	8991	14119	62000	3	15	3	6	3

SOURCE LEGEND:

For Approach Volumes:

XX Caltrans Ramp Volume Report 2003

XX Provided by Los Angeles County

XX Costco TIA provided by San Dimas, 2003; directional split estimated at 50/50 where needed; 50/50 split cross-checked against AM and PM turning movement counts as well

XX ADTs from Pomona Phase 1 sources; directional split estimated at 50/50 where needed; some peak period volumes converted to ADT where needed

XX From counts provided by County on 6/13/05

XX Data received July 2005

XX Data received from County 10/26/05

For Incidents:

XX Compiled from Phase 1 data sources

XX 2003 data from CHP report provided May 2005