


February 14th, 2006

# San Gabriel Valley Traffic Forum

## ATMS Improvement Project

## Local City Control Site Conceptual Design

(Deliverable 2.6.3)

Draft

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# SAN GABRIEL VALLEY TRAFFIC FORUM

# LOCAL CITY CONTROL SITE CONCEPTUAL DESIGN

**(Deliverable 2.6.3.1)**

**DRAFT**

Prepared for:

**LA County Department of Public Works**

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**February 14th, 2006**

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# 1. INTRODUCTION

The San Gabriel Valley Traffic Forum (SGVTF) is one of the planned Intelligent Transportation Systems (ITS) improvement projects that the Los Angeles County Department of Public Works (County) is developing as part of the Traffic System Management (TSM) program in order to improve traffic flow and enhance arterial capacity in a cost-effective way where roadway widening is not possible. The purpose of the SGVTF Project is to design, develop, and deploy an Advanced Transportation Management System (ATMS) that can be tailored to each Agency's operational needs so that traffic signals can be synchronized and ITS systems integrated across jurisdictional boundaries. The SGVTF Project focuses on the specific needs of each Agency to manage their ATMS and recommends improvements to field infrastructure (e.g., controllers, detection systems, communications, etc.) and centralized Traffic Control Systems (TCSs) and/or Traffic Management Centers (TMCs) to meet those requirements. When the SGVTF is successfully completed, each of the Agencies responsible for traffic signal operations will have full access to an ATMS that monitors and controls the traffic signals within their jurisdiction. In addition, Agencies will be able to synchronize their signals and exchange traffic information in real-time with neighboring Agencies. This will allow the Agencies to respond to recurrent and non-recurrent congestion in a coordinated fashion across jurisdictional boundaries.

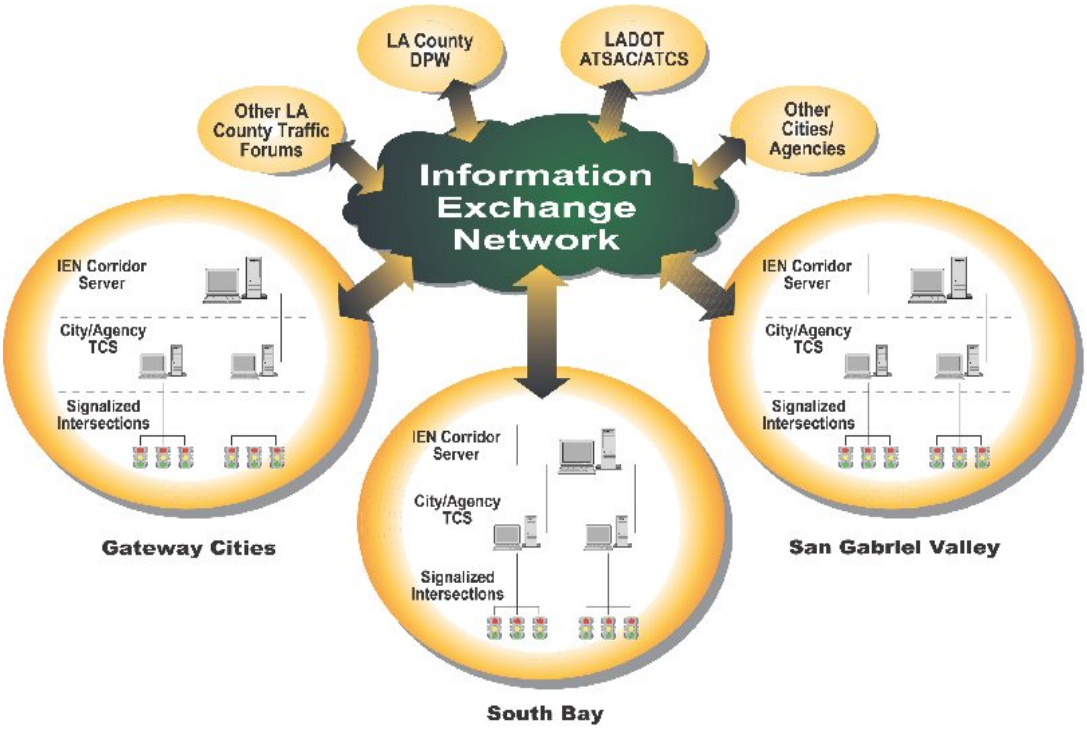
The SGVTF Project area ranges from Cities bordering the California State Route (CA SR) 110 and I-710 freeways to the west, I-210 freeway to the north, CA SR 57 freeway to the east, and the CA SR 60 freeway to the south. It encompasses 24 municipalities as well as unincorporated portions of Los Angeles County. The traffic signals in this Region are operated by many of the individual Agencies, County, and Caltrans District 7.

Developed by the County, the Countywide Information Exchange Network (IEN) is the integrated system framework that connects participating Agency ATMSs into a Regional network to support the operational goals identified above. The Countywide IEN supports traffic signal operations at the Local level, Corridor level, and Regional level. The SGVTF assumes the availability of the Countywide IEN at the Corridor and Regional levels. Therefore, the SGVTF Project is focused on the selection of TCSs and the integration of those systems to the Countywide IEN at the Local level. The eventual ATMS design for the SGVTF will take into account the interface to the IEN and its requirements at the Local level and encompass the following six (6) core components:

- ATMS and/or TCS (Individual Agency)
- Detection and Surveillance
- TMC and/or Workstation Layouts (ATMS and/or IEN)
- Communications Network
- SGVTF Participation/Coordination (City-specific and/or SGVTF-Regional integration)
- Operations and Maintenance (O&M)

As depicted in Exhibit 1.1, the Countywide IEN comprises a series of computer servers, communication networks, and software applications that integrates these components for the collection and transfer of data to support Corridor and Regional functions throughout Los Angeles County.

**Exhibit 1.1 – Countywide Information Exchange Network (IEN)**




## 1.1 AGENCY LEVEL DEFINITIONS

Four (4) Agency roles or "Levels" have been defined as well as a planning-related Level (Region Coordinator) for the implementation of the LCCS based upon the level of interaction an Agency will have in managing its traffic operations:

**Level 1**

- Agency does NOT operate its traffic signals
    - Agency wants to be "Agency B" on another Agency's ATMS
    - Another Agency operates its traffic signals (e.g., LA County DPW)
- Provided with an IEN W/S to monitor traffic signals & incident management activities
- No separate ATMS W/S provided

**Level 2A**

- Agency passively manages its traffic signals
    - Establish initial signal timings, monitor system status daily, etc.
    - May operate on an exception/as-needed basis
    - Monitor mainly for alarms & malfunctions
- Agency wants to be "Agency B" on another Agency's ATMS
- Provided with an IEN W/S to monitor traffic signals & incident management activities [Regional view]
- Maintains a separate ATMS W/S connected to "host" Agency's ATMS [Local view]

**Level 2B**

- Agency actively manages & operates its own ATMS
    - Actively manages ATMS during exceptions
    - Passively manages ATMS during AM & PM peak periods
- Agency may operate some other ITS devices (small amount)
- Agency may operate other Agencies' traffic signals (Level 1)
- Agency may "host" other Agencies' traffic signals (Level 2A)
- Maintains an LCCS facility to manage traffic signals & incident management activities
    - IEN W/S [Regional view]
    - ATMS W/S [Local view]
    - CDI between the ATMS & IEN

**Level 3**

- Agency actively manages its own ATMS & other ITS devices (large amount)
    - Typically AM & PM peak period traffic operations & incidents
    - May support 24/7 operations
- Agency may operate other Agencies' traffic signals (Level 1)
- Agency may "host" other Agencies' traffic signals (Level 2A)
- Agency will have a TMC from which to operate its ATMS, the IEN, & other ITS devices
- Maintains an TMC/LCCS facility to manage ATMS & incident management activities
    - IEN W/S (Regional view)
    - ATMS W/S (Local view)
    - CDI between the ATMS & IEN

Each Agency has been mapped to one of these Levels based upon the types of traffic and incident management functions and operations the Agency is proposed to be performing following the ATMS implementation and not what is being done today. Exhibit 1.2 presents the Agency/Level mapping for the SGVTF.

**Table 1.1 – SGVTF Agency/Level Mapping**

| Level 1 | Level 2A | Level 2B | Level 3 |
|---|---|---|---|
| La Puente* | Azusa | Alhambra | Caltrans* |
| San Marino | Baldwin Park | Arcadia | LA County DPW |
| South El Monte* | Duarte | Covina | Pasadena* |
| South Pasadena | El Monte | Glendora | |
| Temple City | Monrovia | Irwindale | |
| | Montebello* | Rosemead | |
| | Monterrey Park | San Dimas* | |
| | San Gabriel | West Covina | |

*Will not be receiving funding at this stage of SGVTF Project

## 1.2 PURPOSE OF DOCUMENT

The purpose of this document is to develop a Conceptual Design for each Local City Control Site (LCCS) located at each participating Agency's building. This document will describe:

- Preliminary site locations
- System architecture and equipment required for each site
- Typical LCCS configurations
- Space requirements
- Staffing requirements
- Training requirements
- Overall functionality of each computer system

## 1.3 ORGANIZATION OF DOCUMENT

After this introduction, the report is broken into the following sections:

**Section 2:** System Architecture, hardware and software inventory

**Section 3:** Preliminary site locations, set-up requirements for hardware and software.

**Section 4:** Sequencing

## 1.4 REFERENCED DOCUMENTS

The following documents have been used as reference material in the preparation of this report:

- San Gabriel Valley Traffic Forum Project
- Deliverable 2.1.2: Operational Objectives
- Deliverable 2.2.2: System Needs
- Deliverable 2.3.1.1: Concept-of-Operations
- Deliverable 2.3.2.1: ATMS User Requirements
- Deliverable 2.3.3.1: ATMS Functional Requirements
- Deliverable 2.5.1.1: ATMS Alternatives Analysis
- Deliverable 2.5.4.1: Systems Recommendation Report

| | |
|---|---|
| | |
| | |
| | |

# 2. SYSTEM ARCHITECTURE

The Los Angeles County Department of Public Works (County) has developed the Information Exchange Network (IEN) to allow participating Agencies share and coordinate arterial traffic information among the Agencies, as a result, it permits a countywide response to traffic conditions and major events. IEN provides the following high-level functions:

- Provides a standard method of sharing data between Traffic Management Centers (TMCs)
- Allows joint Agency planning and coordination to facilitate seamless traffic flow between jurisdictions, and major arterials
- Shares incident information among Agencies

The IEN permits Agencies to share traffic information at Regional, Corridor, and Local levels arterial traffic. Each is briefly described below.

At the **Local** level – Agencies will have the ability to monitor and mange their arterial traffic conditions, coordinate and share data at Local, Corridor and Regional levels. Those Agencies that may not have sufficient resources to manage their local traffic devices can receive traffic operations support from the Agencies at the Corridor or Regional Level such as the County.

At the **Corridor** level – Traffic Management Centers (TMC) will have the ability to collect information from the other Agencies within their sub-region, select and implement cross-jurisdictional coordinated signal timing, and select incident responses.

At the **Regional** level – the County will have the ability to monitor and have limited control to manage the traffic conditions on arterial roads.

## 2.1 LOCAL CITY CONTROL SITE

The LCCS is the location where the local traffic management system and the local IEN components are both located. In order to achieve the desired LCCS functionality, the major equipment that encompasses the IEN network in the LCCS are briefly described below.

**IEN Corridor Server –** will be installed at sub-regional TMCs. It collects traffic data from various Traffic Control Systems (TCS) within the SGVTF region, and then provides a regional view of the traffic condition via the IEN workstation. The IEN Corridor Server runs the components that make up the backbone of the corridor network. This includes real-time data delivery, event distribution, database servers, and the user and privilege management systems. For this project, the SGV IEN Corridor Server will be located at the County Traffic Management Center (TMC).

**IEN Workstation –** provides a Regional view of the traffic conditions and provides limited control of local traffic signals. All funded Agencies will receive an IEN workstation. The IEN workstation will run the IEN user interface at the local level.

**IEN Site Server –** is a software application that can reside on the same computer that is provided as the IEN workstation. The Site Server handles the communications between the IEN workstation and the IEN Corridor Server for data exchange. The IEN workstation sends and receives traffic data and requests through the IEN Site Server software application. All funded Agencies will receive an IEN site server.

**CDI –** is a software application to exchange data between the TCS, IEN Site Server, and IEN Corridor Server. The CDI sends and receives its traffic data through the IEN Site Server. Where possible, a switch device will be provided to share the IEN workstation's keyboard, video monitor, and mouse with the CDI computer (as necessary). The CDI will typically be located in the communication room close to the local TCS central server.

**ATMS Server –** interfaces to field devices such as CMS, CCTV and Traffic Controllers. It provides control, monitoring, and diagnostics. The ATMS server also interfaces to the IEN to send and receive data related to CMS, CCTV and traffic signals. The participating Agency has the option to connect to the County traffic control system or use their own traffic control system to control their traffic signals.

**ATMS Workstation –** interfaces to the ATMS server via network connection. The operator or end user can use this workstation to manage traffic signals, CMS, and CCTV within their own jurisdiction.

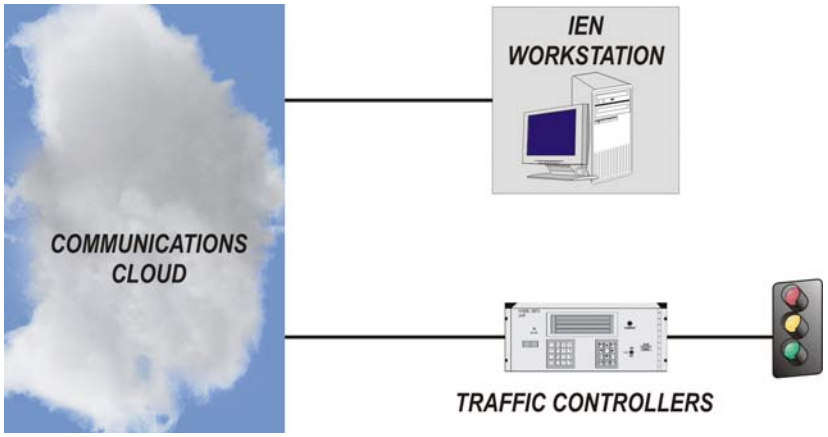
**Four different levels** of operations have been defined to categorize the participating Agencies. The LCCS conceptual design for each Agency will be based on one of these Levels. The following will describe a typical LCCS architecture, typical equipment layout for each Level.

## 2.2 LEVEL 1 AGENCY

A typical LCCS architecture for Level 1 Agency is presented in Exhibit 2.1. The LCCS for Level 1 Agencies consist of the following equipment:

- IEN Workstation (Office area)
- IEN Site Server Software Application
- Router (Communication Room)
- Communication line to the County TCS (Communication Room)
- Communication line to SGV Corridor Server (Communication Room)

**Exhibit 2.1 – Typical Level 1 Agency LCCS Architecture**




The IEN workstation will typically be installed in the office of a staff that is responsible for monitoring traffic signals. Depending on the final design of the system for Level 1 Agencies, the IEN Site Server software application may be installed on the IEN workstation. If it requires a separate computer, it will be installed in the communication room. The network router will be installed in the communication room or closet where communication lines will be terminated.

Level 1 Agencies' traffic signal controllers will be connected to the County TCS, which allows the County to collect traffic data, monitor, and control of the traffic signals. The collected traffic data will then be sent to the IEN Corridor Server that communicates with the IEN Site Server and then to the IEN workstations at each Agency via a dedicated communications line.

The County will install an IEN workstation for each funded Level 1 Agency to provide a Regional view of the traffic conditions, and limited control of their local signals. The IEN workstation should be dedicated to IEN and should not run additional software applications.

Exhibit 2.2 and Exhibit 2.3 show the IEN equipment layout options in a typical office space. A number of Level 1 Agencies do not have sufficient space to house the additional computer workstation. In Exhibit 2.3, a KVM switch is provided to use one (1) set of keyboard, video display and monitor to control both the IEN Server (and associated IEN workstation) and an existing office computer.

Generally Level 1 agencies do not actively operate their traffic signals. Throughout the year therefore traffic signals will be operated and monitored by the County. Therefore a part time staff person spending less than 25% of their time to coordinate with the County TMC would be sufficient.

**Exhibit 2.2 – Typical Level 1 LCCS Equipment Layout (Option 1)**

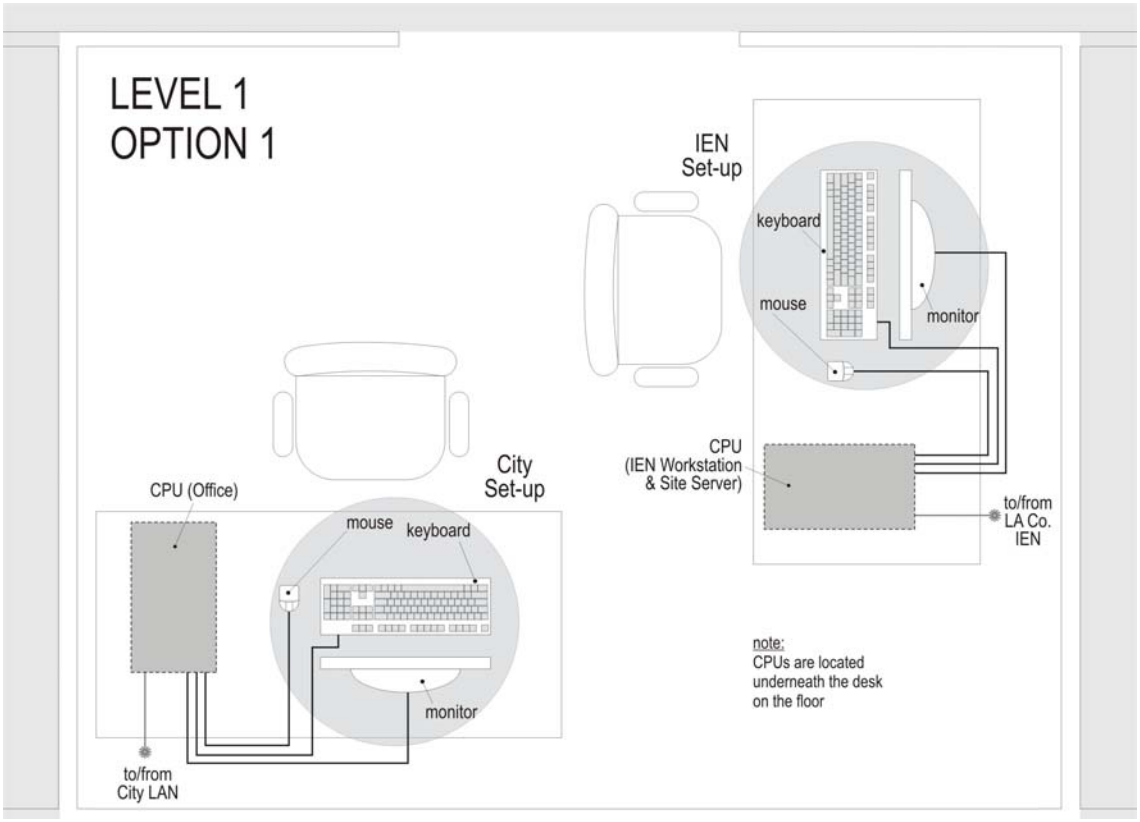
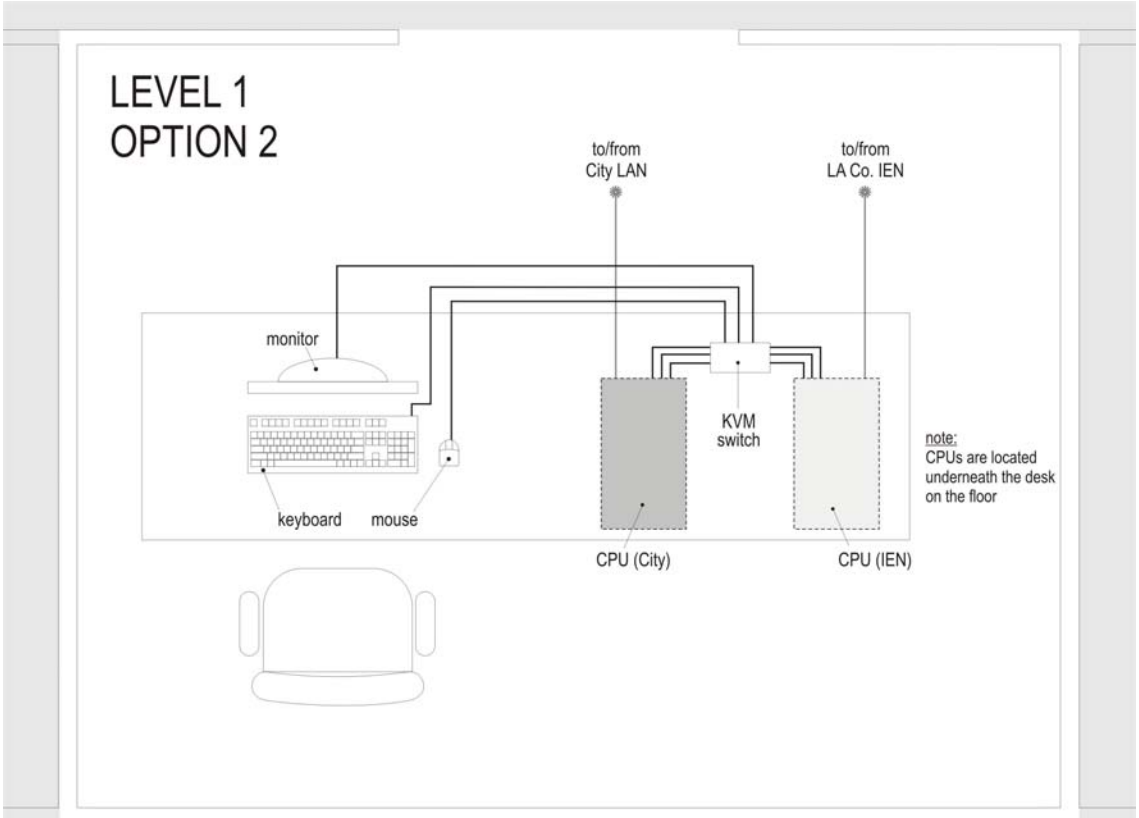


**Exhibit 2.3 – Typical Level 1 LCCS Equipment Layout (Option 2)**

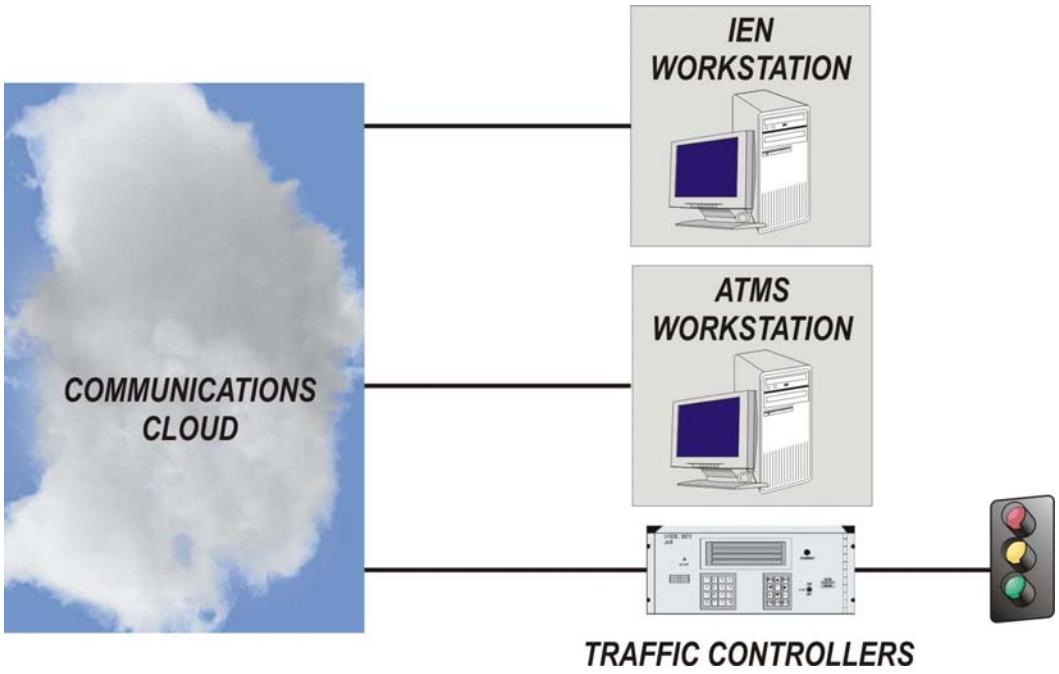



## 2.3 LEVEL 2A AGENCY

The LCCS architecture for Level 2A Agencies is presented in Exhibit 2.4. The LCCS equipment for Level 2A Agencies consist of the following equipment:

- IEN Workstation (Office Space)
- IEN Site Server Software Application
- ATMS Workstation (Office Space)
- Router (Communication Room)
- Communication line to SGV Corridor Server (Communication Room)
- Communication line to the County TCS (Communication Room)

**Exhibit 2.4 – Typical Level 2A Agency LCCS Architecture**




Level 2A Agencies traffic signal controllers are connected to the County TCS which allows the County to collect data, monitor, and control their traffic signals. The collected traffic data will then be sent to the IEN Corridor Server that communicates with the IEN Site Server to send data to IEN workstations via a dedicated communications line. The County will install an IEN workstation for each funded Level 2A Agency to provide a Regional view of the traffic conditions, and limited control of their local signals. The IEN workstation should be dedicated to IEN and should not run additional software applications.

The IEN workstation will typically be installed in the office of a staff that is responsible for monitoring traffic signals. Depending on the final design of the system for Level 2A Agencies, the IEN Site Server software application may be installed on the IEN workstation. If it requires a separate computer, it will be installed in the communication room. The network router will be installed in the communication room or closet where communication lines will be terminated.

Level 2A Agencies will have an ATMS workstation to allow monitoring and control of the traffic signals. If the traffic signals for the Level 2A Agency are controlled by the County, then it will receive an ATMS workstation for the County.

Exhibit 2.5 and Exhibit 2.6 present typical equipment layout for Level 2A Agency in a typical office space. Level 2A Agencies also have the option to use a KVM switch to share one (1) set of keyboard, video, and monitor between two workstations.

**Exhibit 2.5 – Typical Level 2A LCCS Equipment Layout (Option 1)**

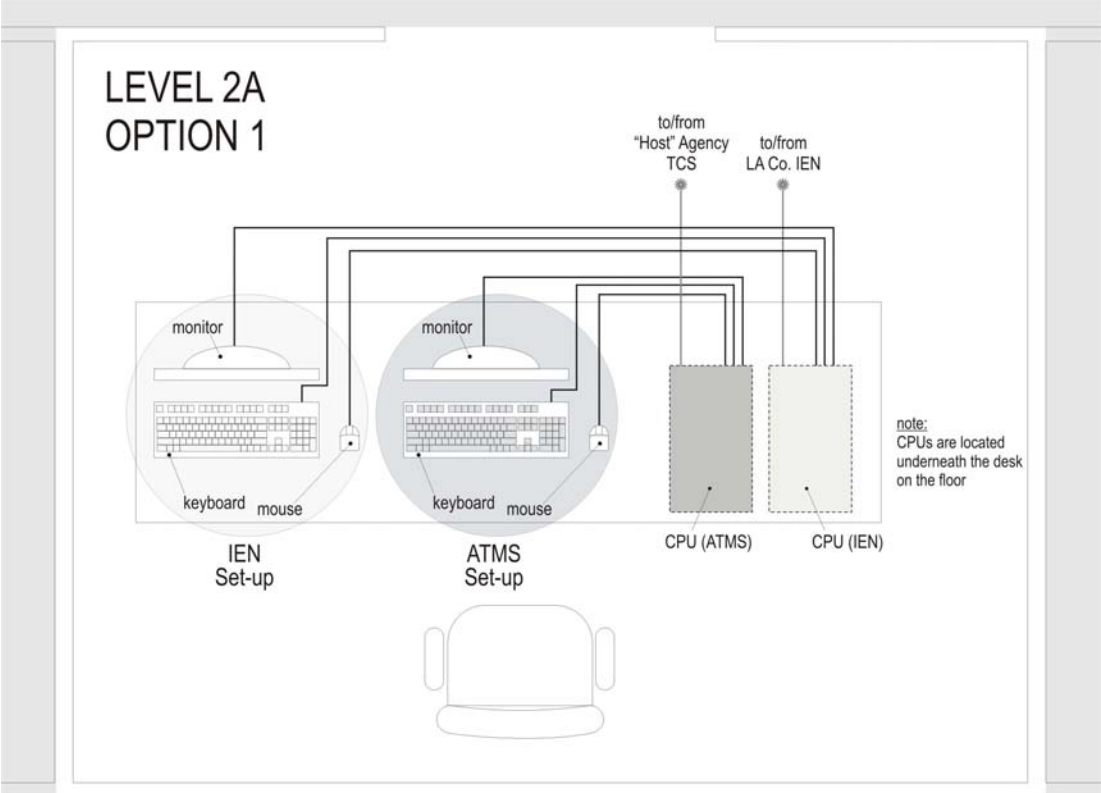
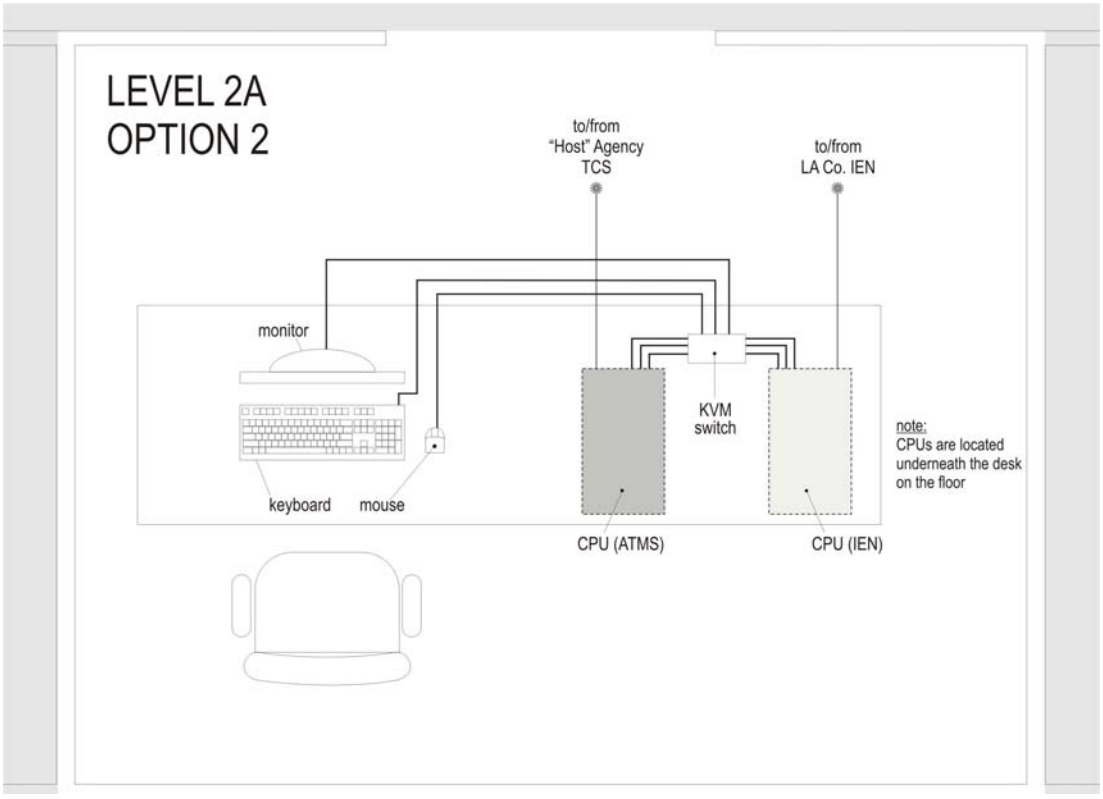



**Exhibit 2.6 – Typical Level 2A LCCS Equipment Layout (Option 2)**



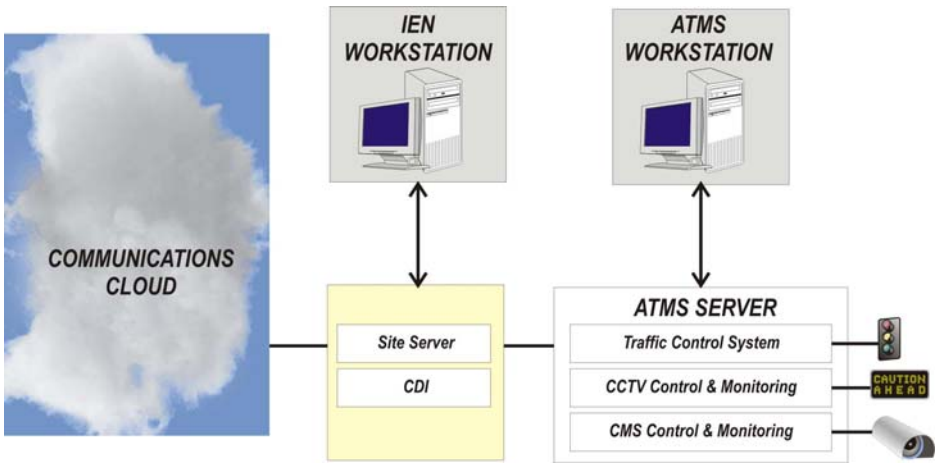
Generally Level 2A Agencies do not actively operate their traffic signals. Occasionally, the responsible staff may change settings due to accidents or special events. Most of the year the traffic signals will be operated and monitored by the County, therefore a part time staff spending about 25% of his or her time to coordinate with the County TMC would be sufficient. A three (3) day training course would allow the responsible staff at Level 2A agency to operate and interface with the County TMC operations staff.

## 2.4 LEVEL 2B AND 3 AGENCIES

The LCCS architecture for Level 2B and 3 Agencies are presented in Exhibit 2.7. All Level 2B and 3 Agencies would have their own existing ATMS Server and ATMS workstation. Therefore, depending upon the ATMS Server that the participating SGVTF Agency is using, the Local Agency and the County will determine the type of CDI required to interface the local TCS with the IEN Network. The Level 2B and 3 Agencies will also receive an IEN workstation from the County in order to be able to view Regional traffic. The LCCS equipment for Level 2B and 3 Agencies are:

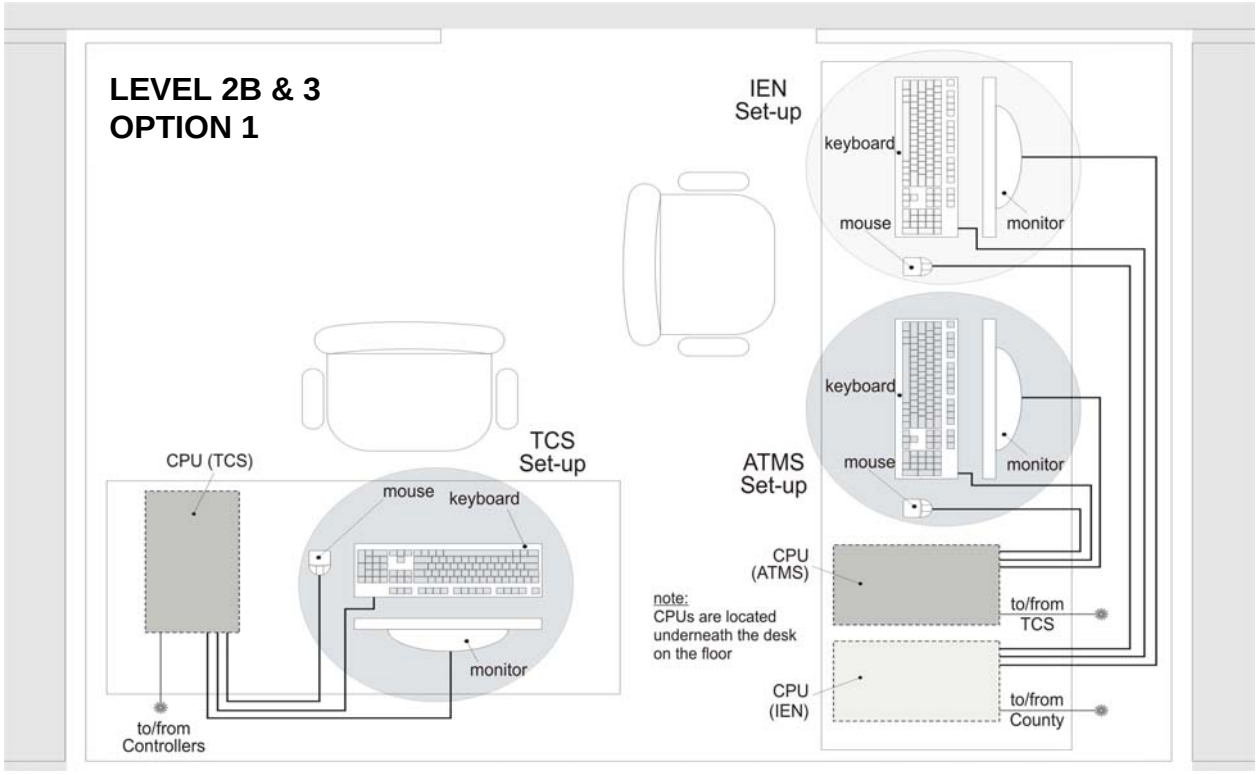
- IEN Workstation (Office)
- IEN Site Server and Software Application
- IEN CDI Software Application
- ATMS Workstation (Office)
- ATMS Server (Communication Room)
- Router (Communication Room)
- Communication line to SGV Corridor Server (Communication Room)
- Communication line to the County TCS (Communication Room)

**Exhibit 2.7 – Typical LCCS Architecture for Level 2B and 3 Agencies**

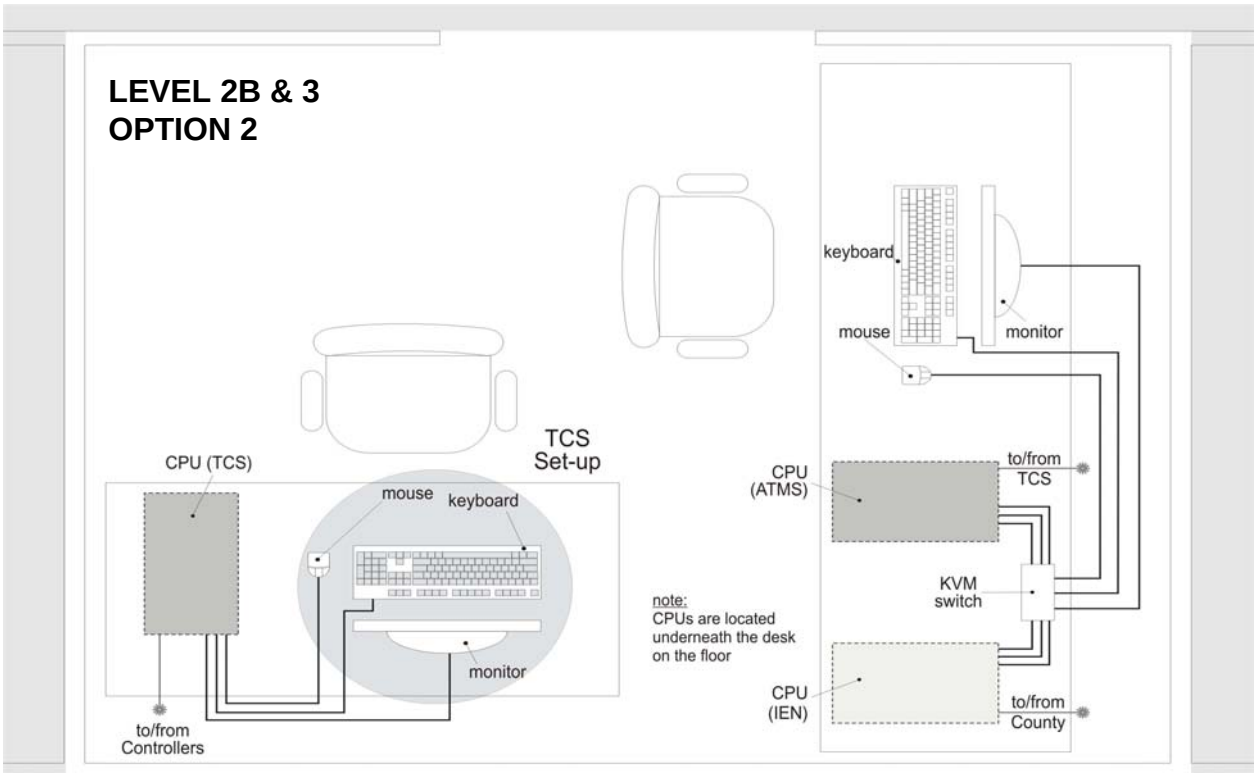



The IEN and ATMS workstations are normally installed in the office of a staff that is responsible to monitor and control the traffic signals. The rest of the equipment is normally installed in the communication room. Exhibit 2.8 and Exhibit 2.9 show the typical equipment layout for Level 2B and 3 Agencies. Exhibit 2.9 presents a typical equipment layout with a KVM switch to share one (1) set of keyboard, video, and monitor to control both the IEN Site Server (and associated IEN workstation) and the ATMS workstation.

## Exhibit 2.8 – Typical Level 2B and 3 Agencies LCCS Equipment Layout (Option 1)




## Exhibit 2.9 – Typical Level 2B and 3 Agencies LCCS Equipment Layout (Option 2)



## 2.5 HARDWARE AND SOFTWARE INVENTORIES

This section provides a list of LCCS hardware and software specifications and costs. The **IEN workstation** consists of a typical personal computer with monitor, mouse, and keyboard that will be dedicated to the SGVTF project. It will utilize the Microsoft Windows Operating System to run the required IEN software applications. All funded Agencies will receive an IEN Workstation. A typical IEN Workstation has the following specifications:

**Table 2.1 – IEN Workstation Specification**

| Item | Specification |
|---|---|
| Chassis | Minimum CPU – 2.0 GHz Pentium class<br>Minimum RAM – 512 MB<br>Height = 12.7”<br>Width = 3.8”<br>Dept = 14.0” |
| LCD Flat Panel Monitor | 19”<br>Height = 19.46”<br>Width = 14.80”<br>Dept = 8.37” |
| Mouse | Optical |
| Keyboard | |
| Operating System | Microsoft Windows XP Professional |
| Cost | About $1,600 |

If the County monitors and controls traffic signals for a Level 2A Agencies, that Agency will receive an **ATMS workstation.** It consists of a typical personal computer with a monitor, a keyboard, and a mouse. It will run the required software application and GUI interface to the associated TCS for monitoring and control of traffic devices (e.g. traffic signal, CCTV, CMS). A typical ATMS workstation has the following specifications:

**Table 2.2 – ATMS Workstation Specification**

| Item | Specification |
|---|---|
| Chassis | Minimum CPU – 2.0 GHz Pentium class<br>Minimum RAM – 512 MB<br>Height = 12.7”<br>Width = 3.8”<br>Dept = 14.0” |
| LCD Flat Panel Monitor | 19”<br>Height = 19.46”<br>Width = 14.80”<br>Dept = 8.37” |
| Mouse | Optical |
| Keyboard | |
| Operating System | Microsoft Windows XP Professional |
| Cost | About $1,600 |

The County will provide IEN workstation, IEN Site Server, and CDI software applications. Depending on the final configuration of the system, the IEN workstation and Site Server software application may be installed on the IEN workstation, or on a separate computer.

### 2.5.1 SGV Pilot Project

The primary objective of the Early Deployment Project (EDP) was to allow Agencies in San Gabriel Valley access the Caltrans District 7 Los Angeles County freeway speed data before the installation of the East San Gabriel Valley Pilot system. As part of the SGV Pilot project the County installed a workstation with dedicated communication lines at the following Agencies:

- Irwindale
- Pasadena TMC
- Arcadia City Hall
- Monrovia City Hall
- Azusa City Hall
- Duarte City Hall
- San Dimas City Hall
- Baldwin Park City Hall

The communication lines are still active, however the workstation chassis need to be upgraded.

# 3. PRELIMINARY SITE LOCATIONS

## 3.1 CITY OF ALHAMBRA

The City of Alhambra is categorized as **Level 2B** Agency. The City currently has a master controller that controls several signals. The City is planning to upgrade their traffic signal and is not interested in hosting other cities.

A 96" x 25" table in the City Traffic Engineer office is located at the City Hall will be designated as the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- ATMS Server
- ATMS Workstation #1
- ATMS Workstation #2
- IEN Site Server & software application
- IEN Workstation
- IEN CDI software application
- IEN Router
- CCTV Control System

The ATMS Server and ATMS workstation will be provided and installed by the City, and the rest of equipment are provided and installed by the County. The IEN CDI and Site Server software applications will be installed on an another computer. If these two software applications are installed on another computer, it will be located in the Communication room. The IEN router will be installed at the Communication room, where the communication lines from the County TMC will be terminated.

The City Traffic Engineer who is currently responsible for maintaining and managing the traffic signals also will be responsible for operating the IEN workstation. No additional resources are required to operate the IEN workstation.

## 3.2 CITY OF ARCADIA

The City of Arcadia is categorized as **Level 2B** Agency and currently has a Multisonic Traffic Control System located at the City Hall. The City has ITS funding to replace its traffic control system, and implement a TMC. The City will also receive a CDI to interface its traffic control system to IEN. The following equipment and software applications will be installed at the TMC:

- IEN Workstation
- IEN CDI software application
- IEN Site Server & software application.
- CCTV Control System
- ATMS Server
- ATMS Workstation
- IEN Router

The ATMS Server and ATMS workstation shall be provided and installed by the City, and the rest of equipment will be provided and installed by the County. The IEN CDI and Site Server software applications could either be installed on the IEN Workstation or another computer.

## 3.3 CITY OF AZUSA

The City of Azusa is categorized as **Level 2A** Agency. The City would like the capability to control their signals (i.e. adjust timing or change timing plans) on an exception basis, in addition to the capability of monitoring their own, and neighboring cities, traffic signals. The City does

not have a TCS and would use a provided County ATMS workstation to control their traffic signals.

The engineering department will be relocated to the Corporate Yard (809 Angelino Avenue in Azusa) in the near future. Dedicated space (either in a cubicle or an office) will be designated as Operator Control area at the Corporate Yard. The following equipment and software applications will be installed at the Operator Control area:

- ATMS Workstation
- IEN Workstation
- IEN Site Server & software application
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County. The Site Server software application could either be installed on the IEN Workstation or on a separate computer. If these two software applications are installed on a separate computer, it will be located in the Communication room. The IEN router will be installed at the Communication room, where the communication lines from the County TMC will be terminated.

## 3.4 CITY OF BALDWIN PARK

The City of Baldwin Park is categorized as **Level 2A** Agency. The City would like to have the capability to control their signals (i.e. adjust timing or change timing plans). Sometime in the future, Baldwin Park might be interested in operating as a Level 2B Agency (no definite plans as to when this might happen) and potentially also host neighboring cities traffic signals.

City's traffic signals will be connected to the County ATMS. A portion of David Lopez's office will be used for Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- ATMS Workstation
- IEN Workstation
- IEN Site Server & software application
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County. The Site Server software application could either be installed on the IEN Workstation or on a separate computer. If these two software applications are installed on a separate computer, it will be located in the Communication room. The IEN router will be installed at the Communication room, where the communication lines from the County TMC will be terminated.

Due to limited space, the new IEN CPU would be located near David's office workstation and would be connected to existing monitor, keyboard, and mouse using a KVM switch. As part of the SGV Early Deployment Project (EDP), the City received an EDP Workstation that is located on a small table in David's office. The ATMS workstation would replace the existing EDP workstation and the City would like to upgrade from the existing 17-inch flat screen monitor to a 21-inch LCD flat screen monitor.

David Lopez will be the primary user. He anticipates using the IEN and ATMS workstations on an occasional, or as-needed, basis.

The communications room is in the basement at City Hall, located two levels below Public Works area (approximately 150 to 200 feet from David Lopez's office). The communication lines will be terminated and the router will be installed in this room.

## 3.5 CITY OF COVINA

City of Covina is categorized as **Level 2B** Agency. The City would like to have the capability to actively manage their traffic signals and any other ITS devices that might be installed in the future. There is a small cubicle available within the Public Works office area, which will be used as the Operator Control area. The following equipment and software applications will be installed at the Operator Control and Police department area:

- ATMS Workstation
- ATMS Server
- IEN Workstation (Public Works area)
- IEN Site Server & software application
- IEN Router
- IEN CDI software application
- IEN Workstation (Police Department)
- CCTV Control System

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County. The City would like to partner with LACO for signal timing coordination on major arterials that cross through the City. However, the City of Covina is not interested in "hosting" another Agency's TCS.

Within the Public Works Department, Michael Scott and Mr. Tolentino would be the primary system users. In addition, the City requested that a second IEN Workstation be installed in the Watch Commander's office located within the Covina Police Department.

There is room for the router and the IEN Site Server (if necessary) within the City's existing communications room.

With respect to having an IEN Workstation in the Watch Commander's office, due to space limitations, the Police Department is interested in utilizing a KVM switch to connect an IEN CPU to an existing keyboard, video monitor, and mouse. The IEN CPU could fit easily on the floor below the desktop near the existing Watch Commander's workstation.

## 3.6 CITY OF DUARTE

The City of Duarte is categorized as **Level 2A** Agency. The City is not interested in actively operating or managing their traffic signal system; however, they would like the capability of monitoring their own, and neighboring cities, traffic signals. The City's traffic signals will be connected to the County TCS and the County will operate and manage their traffic signal system. Portion of Steve Esbenshade's office will be allocated to the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- ATMS workstation
- IEN Workstation
- IEN Site Server & software application
- IEN Router
- KVM Switch

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

Steve Esbenshade and an assistant civil engineer will be the primary users. He anticipates that the IEN capabilities will be used on an occasional, or as-needed, basis. Due to space limitations, he would prefer having the IEN CPU connected to his existing office workstation with a KVM

switch rather than entirely new IEN workstation. The router will be installed at the communication room; in addition the City has a back-up power generator.

## 3.7 CITY OF EL MONTE

The City of El Monte is categorized as **Level 2A** Agency. The City would like to have the capability to control their signals (i.e. adjust timing or change timing plan) on an exception basis. A portion of Ken Ballinger's or Joe Espinosa's office will be allocated to the Operator Control area. Both are located at the Maintenance Division office building (3527 Santa Anita Avenue in El Monte). City's traffic signals will be connected to the County ATMS, and the County will mostly monitor and control the traffic signals. The following equipment and software applications will be installed at the Operator Control area:

- ATMS Workstation
- IEN Site Server & software application
- IEN Workstation at Public Works area
- IEN Router
- IEN Workstation at Police Department

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

Ken Ballinger and Joe Espinosa will be the primary users (mostly for maintenance purposes).

## 3.8 CITY OF GLENDORA

City of Glendora is categorized as **Level 2B** Agency. The City currently has two Econolite masters, one is located in the communication room in the basement of the City Hall and the other is located in the field. The City would like to bring the communication lines from the signal controllers to the TCS into the communication room in the City Hall. As part of the SGV Early Deployment Project, the City received an EDP Workstation, and currently has a dedicated lease line from County to City Hall. A Dell Computer with 19" LCD, CISCO Router and a DSU/CSU is currently installed at the traffic engineer desk, however, it is not being used. This desk will be used as the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation at Public Works area (upgraded as needed from the current EDP Workstation)
- IEN Router
- ATMS server
- ATMS Workstation
- IEN CDI software application
- IEN Site Server & software application

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

If a separate computer is required for IEN Site Server, it will be installed in the communication room. The primary user will be Michael Maston.

## 3.9 CITY OF IRWINDALE

The City of Irwindale is categorized as **Level 2B** Agency. After the Police Department is relocated to a different office building a few blocks from City Hall, some office space will be dedicated to traffic management activities. This office space would house the IEN and ATMS workstations, and the ATMS central system. In addition, the City would like to have a wall-mounted video display in this office. The City would also like to locate a second IEN workstation within the Police Department once they are relocated (expected to occur sometime in 2006). In addition, the City requested that a second IEN Workstation be located in the Irwindale Police Department to be used by selected traffic officers.

- ATMS Workstation
- IEN Workstation #1
- IEN Workstation #2 at Police Station
- IEN Site Server & software application
- IEN Router
- ATMS server
- IEN CDI software application
- CCTV Control System

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County. Within the Public Works Department, Jose Loera and possibly one other engineer would be the primary system users. If a computer is required for the IEN Site Server, it will be installed in the communication room next to the router.

## 3.10 CITY OF MONROVIA

City of Monrovia is categorized as **Level 2A** Agency. The City would like the County to monitor and operate their signals on a regular day-to-day basis, but also wants to have the capability to control their signals (i.e. adjust timing or change timing plan) on an exception basis, and the capability of monitoring their own, and neighboring cities', traffic signals. A cubical in the City Hall building with 76" x 26" work surface will be used for the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation at Public Works area
- IEN Site Server & software application
- ATMS Workstation
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

The City has contracted an On-Call consultant for traffic engineering tasks. He will be the main user. If a separate computer is required for IEN Site Server, it will be installed in the communication room.

## 3.11 CITY OF MONTEREY PARK

The City of Monterey Park is categorized as **Level 2A** Agency. The City would like to have the capability to control the signals on as needed basis. A cubical with 70" x 26" table in the City Hall will be used as the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation at Public Works area
- IEN Site Server & software application
- ATMS Workstation
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

Elias Saykali would be the primary user. If a separate computer is required for IEN Site Server, it will be installed in the communication room.

### 3.12 CITY OR ROSEMEAD

City of Rosemead is categorized as **Level 2B** Agency. The City would like to have the capability to actively manage their traffic signals.

Ken's office has an "L" shape counter table that is two feet wide and the long side is 8 feet and shorter side is 76", which will be used as the Operator Control area. The following equipment and software applications will be installed at the Operator Control area:

- ATMS Workstation
- IEN Workstation at Public Works area
- IEN Site Server & software application
- IEN Router
- IEN CDI software application
- CCTV Control System

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

If a separate computer is required for IEN Site Server, it will be installed in the communication room.

### 3.13 CITY OF SAN GABRIEL

The City of San Gabriel is categorized as **Level 2A** Agency. San Gabriel would like the County to monitor and operate their signals, and the city would also like to be able to have the capability to monitor and control their signals. The Operator Control area will be in the maintenance yard's break room next to the technician's office. A 60" x 30" desk and a 38" x 28" stand with three shelves are available. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation
- IEN Site Server & software application
- ATMS Workstation
- Wall mounted IEN Monitor
- IEN Router
- KVM switch

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

The primary user of this system would be Ed Sheets who is City's electrical foreman, and his office is in the yard.

### 3.14 CITY OF SAN MARINO

The City of San Marino is categorized as **Level 1** Agency. The City would like the County to monitor and operate their signals, and when they need to change timing plans, they would like to

be able to call the County TMC. The Department of Public Works is in the adjacent building to the police department. The City would like to set up two Operator Control areas. The following equipment and software applications will be installed at the Operator Control areas:

- IEN Workstation #1
- IEN Workstation #2
- IEN Site Server & software application
- KVM switch
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

One IEN workstation in the dispatch room of the police department and the second IEN workstation in John Alderson's office with a KVM switch to switch between his workstation and IEN on as needed basis. If a Site Server is necessary, it will also be located in his office. The second IEN workstation will be located in the dispatch room on the wall.

## 3.15 CITY OF SOUTH PASADENA

The City of South Pasadena is categorized as **Level 2A** Agency. The City would like the County to monitor and operate their signals, and the City would like to be able to have the capability to monitor and control their signals. The City Hall is currently being remodeled. After remodel, a portion of Edward Hiti's office will be used for Operator Control area. A second IEN workstation will be installed at the Police station downstairs. The following equipment and software applications will be installed at the Operator Control areas:

- IEN Workstation #1
- IEN Workstation #2
- IEN Site Server & software application
- KVM switch
- IEN Router
- ATMS workstation

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

Edward Hiti, Deputy Director of Public Works and Steve Moronez, Facility Maintenance Supervisor, will be the primary users.

## 3.16 CITY OF TEMPLE CITY

The City of Temple City is categorized as **Level 1** Agency. The City would like the County to manage its traffic signals while also having the capability to monitor its traffic signals. Portion of Chuck Erickson's office will be used as the Operators Control area. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation
- IEN Site Server & software application
- KVM switch
- IEN Router

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

Currently space is quite limited in both offices; therefore, the IEN Monitor and Keyboard would be shared with an existing workstation using a KVM switch. However, if space becomes available prior to deployment of the IEN system, a complete workstation would be requested.

## 3.17 CITY OF WEST COVINA

The City of West Covina is categorized as **Level 2B** Agency. The City is currently managing 63 of their 83 traffic signals with a centralized TCS. Miguel Hernandez office will be used as the Operators Control area. The following equipment and software applications will be installed at the Operator Control area:

- IEN Workstation
- IEN Site Server & software application
- IEN CDI software application
- IEN Router
- ATMS server
- ATMS workstation
- CCTV Control System
- KVM switch

All the above equipment, software applications and COTS required for IEN will be provided and installed by the County.

In order to fit within the available space and be easy to use, Miguel Hernandez would prefer that an IEN CPU box be located on the floor next to his desk and be connected to his office workstation using a KVM switch. The ATMS workstation would be located on another desk in the same general office area. The CDI server and ATMS central system server would be located in an existing computer room.

# 4. SEQUENCING

The goal of sequencing is to install and implement the IEN and ATMS efficiently and cost effectively. All the Level 1 and 2A agencies would like the County to manage their traffic signals. All the Level 2B Agencies would manage their own traffic signals. The detail sequencing and Acceptance Testing Procedure will be addressed in the final Conceptual Design Document and also in the Phase II of this project.

Below is a high-level sequencing for LCCS systems.

- County ATMS must be fully operational
- Field-to-Center Communications must be completed
- Order C2C dedicated lines
- Install LCCS equipment
- County should conduct an Acceptance test to verify the system is fully functional at each Agency
- Based on the failure category, the SAT should be re-executed
- Agency training would be completed after the SAT