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Deliverable For:

Gateway Cities Traffic Signal Synchronization and Bus Speed Improvement Project

I-5/Telegraph Road Corridor

Deliverable 6.2

Recommendations Report for Local City Control Sites

(Expanded Area)

Draft

Version 1.0

Submitted To:

Los Angeles County
Department of Public Works

Submitted By:

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1 INTRODUCTION

1.1 Background

The County of Los Angeles Department of Public Works Traffic Signal Synchronization, Operation and Maintenance (SOM) Program has proven successful in creating an institutional infrastructure to coordinate the activities of the agencies responsible for traffic signal operations in the County. A key feature of this infrastructure is the Forums - groups of bordering agencies created to encourage and promote inter-agency cooperation. These Forums have enabled funding to be targeted at infrastructure improvements along arterial and arterial/freeway corridors in the County's sub-regions. Such projects are a critical part of what will eventually be a network of integrated ITS systems in Los Angeles County and in Southern California.

The I-5/Telegraph Road Corridor is one such project which will result in arterial infrastructure improvements along Telegraph Road in the South-East Los Angeles County (Gateway Cities) Forum. The expanded Project area includes all major north-south and east-west streets along I-5/Telegraph Road Corridor and contains 276 intersections in 10 different jurisdictions, comprising 8 cities, the County and Caltrans.

The objective of this Project is to design, develop and deploy traffic control systems in the Corridor so that the signals along I-5/Telegraph Road can be synchronized across the jurisdictional boundaries. This Project concentrates on the needs of the agencies in the Project area with respect to signal synchronization along arterials of regional significance and recommends improvements to field infrastructure (including controllers, loops, detectors, and communications) and central traffic control systems to meet those needs.

When successfully completed, each of the agencies responsible for traffic signal operations in the I-5/Telegraph Road Corridor will have full access to an Advanced Traffic Management System (ATMS) that monitors and controls the traffic signals under their jurisdiction. Agencies will be able to synchronize their signals with neighboring agencies, and exchange traffic information in real-time.

Agencies will also be able to exchange data with other agencies in the Gateway Cities region. This will allow the agencies to respond to recurrent and non-recurrent congestion in a coordinated fashion across the jurisdictional boundaries. The traffic control systems therefore form part of a larger, regional approach supporting multi-agency traffic signal operations.

Earlier reports for the I-5 / Telegraph Road Corridor Project addressed the user and functional requirements for the ATMS systems, the interfacing systems, the communication system, and the local control centers. These requirements enabled development of the High Level Design Definition Report (Deliverable 4.1.2), which included Local Control Center (LCC) typical designs.

This System Recommendations Report for Local Control Sites evaluates each participating City's LCC physical layout to derive the most effective, reliable, and economical locations for the local City control sites and computer systems to be implemented with this project. Variances from the typical layouts identified in the High Level Design Definition report are discussed. The methodology for recommending the LCC sites and the potential impacts on the existing facilities in placing the local City control sites at the recommended locations are also discussed.

1.2 Organization of Document

This document is organized into the following Sections:

Section 1: Introduction

Presents the Project background and introduces the document.

Section 2: LCC Recommendations Methodology

Describes the methodology applied in the LCC site analysis and recommendation.

Section 3: LCC Site Analysis

Summarizes the information collected from each City's LCC sites survey including the resources (staff, time, space) available at each cities.

Section 4: LCC Site Recommendations

Presents recommendations for LCC layout for each LCC category.

1.3 Regional Area and Agencies Involved

The I-5/Telegraph Road Corridor Project encompasses several jurisdictional boundaries. Furthermore, it will be integrated, or have the ability to integrate, with many other projects and existing systems in the region through the Information Exchange Network (IEN) architecture. The IEN is a communications network linking together traffic control systems within the County of Los Angeles. It permits the exchange of real-time traffic system data and supports the coordination of traffic signal operations between agencies. The following cities and agencies are involved in the Project:

- Commerce
- Downey
- La Mirada
- Montebello
- Norwalk
- Pico Rivera
- Santa Fe Springs
- Whittier
- Los Angeles County Department of Public Works (The County)
- Caltrans District 7

1.4 Referenced Documents

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

- I-5/Telegraph Road Corridor Project

Deliverables 2.1/2.3: Stakeholder's Operational Objectives and Individual City Reports

Deliverable 3.1.2: Advanced Traffic Management System (ATMS) User Requirements

Deliverable 3.2.1: ATMS Functional and Local Traffic Control Center Requirements

Deliverable 3.3.1: Integration System Requirements

Deliverable 3.5.1: Communications System Requirements

Deliverable 4.1.2: High Level Design Definition Report

- I-105 Corridor Project

  TSMACS User Requirements Report (Final)

  Functional Requirements Report (Draft)

  TMC High Level Design Definitions and Recommendations (Draft)

- San Gabriel Valley Pilot Project

  System Design Report, Final Version 1.0

  System Overview and Status Update (October 2000)

2 LCC RECOMMENDATIONS METHODOLOGY

The LCC High Level Design recommended an architecture (see Figure 2.1) for the corridor based on the functionality desired by each City systems and their ability and willingness to operate and maintain the LCC equipment.

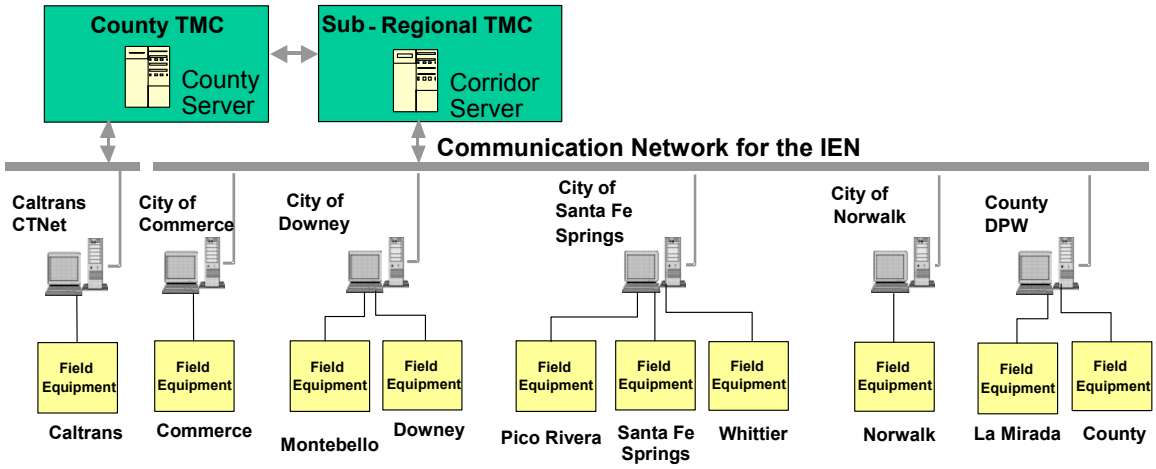

Figure 2-1: I-5/Telegraph Rd. Corridor System Architecture

This was based on the interviews held with the cities during the requirements phase of the project in early 2000. The architecture defined the following three types of LCCs:

(1) Sites with an ATMS client workstation(s) and IEN Access:

The Cities of Montebello, Pico Rivera, La Mirada and Whittier were assigned to this category.

(2) Sites with ATMS client workstation(s), ATMS server functions, IEN access and IEN Server function:

The Cities of Commerce and Norwalk were assigned to this category.

(3) Sites with ATMS client workstation(s), ATMS server functions, IEN access, IEN Server function and hosting for field device communications for partner cities:

The Cities of Downey, and Santa Fe Springs, and LA County Department of Public Works were assigned to this category.

The High Level Design also presented physical layouts for a typical LCC of each type indicated above. This current report takes the work done in High Level design to the next level where LCC locations are identified within each city.

As a starting point for this Task, Siemens ITS met individually with each City. The purpose of these meetings was to discuss the corridor architecture with each City and collect information on how cities plan to utilize the LCC's in terms of functions to be carried out, staffing, and maintenance coordination. An important aspect of these meetings was to identify the size and location of the LCC sites within each City. Appendix A provides minutes of these meetings. Key points identified as a result of these meetings were:

- All cities agreed with the corridor architecture as defined in the High Level Design.

- All cities, except the City of Pico Rivera, were able to identify the potential location of their LCC. The City of Pico Rivera stated that they may be able to allocate space in the City Hall or City Yard in the future but did not want to commit to a location just yet.

- All cities stated that they do not have resources to staff the LCC's for long periods of time outside of peak hours. Most cities will monitor the system on an exception basis, in response to an alarm from the system or during a traffic emergency situation.

- All cities identified a place for the LCC site within existing buildings. The buildings have existing air conditioning and service. It is anticipated that in most cases no upgrade to these in-place support systems will be needed.

- Most cities identified at least two locations for ATMS client workstations – the City Hall and City Yard.

Based on the information collected in these interviews, Siemens ITS carried out an LCC site analysis for each City and developed a recommendation for the LCC layout.

3 LCC SITE ANALYSIS AND RECOMMENDATIONS

3.1 Revised Corridor Architecture

In the previous Task 4.1.2, in which the High Level System Design was developed, only one location for the LCC equipment was considered for each City. The information gathered in the current task identifies additional LCC Site locations at each City and the functionality desired at different locations.

Table 3-1 presents a summary of these findings and Figure 3-1 presents a map showing locations of Primary and Remote LCC Sites within each City. From the Table it can be seen that the City of Montebello, City of Commerce and City of Pico Rivera require LCC equipment only at one location. Further, due to staff resource constraints, these cities do not want to take responsibility for any additional equipment other than that which is required for traffic signal control. Thus, it is recommended that if any CCTV or CMS devices are needed to be located in these cities on the basis of the regional significance of locations, the devices should be operated and maintained by the County. If possible, the cities should be provided with the capability to monitor these devices.

The City of La Mirada desires an ATMS client and IEN client workstations at two locations; the Department of Public Works and the City Hall. This would require two separate physical connections to the servers located at the County TMC as they operate on separate networks. However, a common communication link could be used depending upon the communication medium.

The City of Whittier would like to host an ATMS client workstation and IEN client workstation at both the City Hall and Maintenance Yard and intends to connect its traffic signals to ATMS server located at the City of Santa Fe Springs. This will require a connection between the Maintenance Yard and City Hall.

The City of Norwalk and City of Santa Fe Springs will host ATMS and IEN servers at the Maintenance Yard and desire both ATMS client workstation and IEN client workstation at an additional location at the City Hall. This will require a connection between the Maintenance Yard and City Hall.

The City of Downey will host its ATMS server at City Hall and both ATMS client workstation and IEN client workstation at two additional locations, the Maintenance Yard and the EOC. This will require a connection from the City Hall to both locations.

Figure 3-2 presents the revised Corridor Architecture.

Table 3-1: Functionality Needed at Each Primary and Remote LCC Site in the Corridor

City	Address	ATMS Server	ATMS Client Workstation	IEN Server	IEN Client Workstation	CCTV Monitoring	CCTV Display Equipment
Downey							
Primary LCC Site							
City Hall	11111 Brookshire Avenue	X	X	X	X	X	X
Remote LCC Sites							
Maintenance Yard	TBD		X		X	X	
EOC	Orange/ Paramount		X		X	X	
Police Department	10911 Brookshire Avenue		X			X	
Santa Fe Springs							
Primary LCC Site							
Maintenance Yard	12636 Emmens Way	X	X	X	X	X	
Remote LCC Sites							
City Hall	11710 E. Telegraph Road		X		X	X	
La Mirada							
Primary LCC Site							
Department of Public Works	15515 Phoebe Avenue		X		X	X	
Remote LCC Sites							
City Hall (Resource Center)	13700 La Mirada Boulevard		X			X	
Montebello							
Primary LCC Site							
City Hall	1600 W. Beverly Boulevard		X		X	X	
Commerce							
Primary LCC Site							
City Hall	2535 Commerce Way	X	X	X	X	X	
Pico Rivera							
Primary LCC Site							
City Hall	6615 Passons Boulevard		X		X	X	

City	Address	ATMS Server	ATMS Client Workstation	IEN Server	IEN Client Workstation	CCTV Monitoring	CCTV Display Equipment
Norwalk							
Primary LCC Site							
Maintenance Yard	12610 Imperial Hwy.	X	X	X	X	X	
Remote LCC Sites							
City Hall	12700 Norwalk Blvd.		X		X	X	
Whittier							
Primary LCC Site							
City Hall	13230 Penn St.		X		X	X	
Remote LCC Sites							
Maintenance Yard	12016 Hadley St.		X		X	X	

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Figure 3-1: Location of Primary and Remote LCC Sites

I-5 / Telegraph Road Arterial
I-105 Project Arterial
I-710 Project Arterial
City Hall
Maintenance Yard
Department of Public Works
Police Department
Primary LCC Site
Remote LCC Site

Montebello City Hall
Commerce City Hall
Pico Rivera City Hall
Santa Fe Spring City Hall
Downey Police Department
Downey City Hall
Downey Maintenance Yard
Downey EOC
Santa Fe Spring Maintenance Yard
La Mirada Department of Public Works
La Mirada City Hall

MONTEBELLO
COMMERCE
PICO RIVERA
SANTA FE SPRINGS
WHITTIER
DOWNEY
NORWALK
LA MIRADA

ATLANTIC BLVD
BEVERLY BLVD
Rio Hondo
GREENWOOD BLVD
PARAMOUNT BLVD
WASHINGTON BLVD
ROSEMEAD BLVD
San Gabriel River
SAN GABRIEL RIVER FRWY
WHITTIER BLVD
PAINTER AVE
SLAUSON AVE
TELEGRAPH ROAD
FLORENCE AVE
PIONEER BLVD
NORWALK BLVD
SANTA FE SPRING RD
MULBERRY DR
MILLS AVE
SANTA ANA FRWY
BLOOMFIELD AVE
FIRESTONE BLVD
IMPERIAL HWY
CARMENITA RD
VALLY VIEW AVE
LA MIRADA BLVD
ROSECRANS AVE

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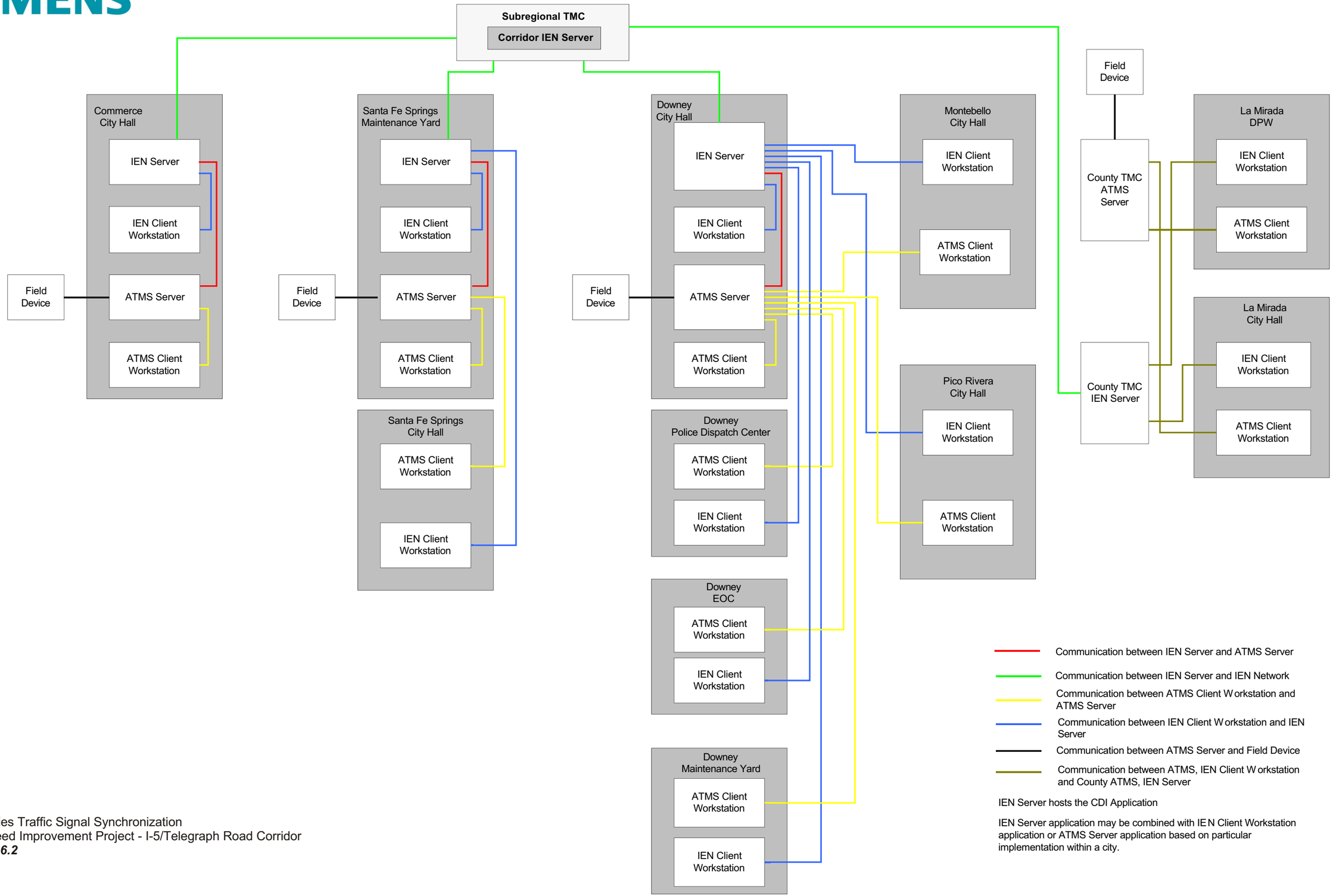
Figure 3-2: Revised Corridor Architecture



3.2 Resources and Requirements for LCC Sites in the Corridor

This Section presents the requirements for the individual LCC sites together with the resources (staff, time, space) available at the cities in the corridor.

3.2.1 City of Commerce

Figure 3-3: Commerce City Hall

The City of Commerce currently operates a traffic control system, QuicNet II from BiTran. The current system resides in a 19 inch rack within an engineer's office at City Hall (see Figure 3-3) located at 2535 Commerce Way. (see Figure 3-4)

The City is suffering from staff shortages and does not want to take responsibility to operate equipment beyond the current traffic control system.

The City would like to upgrade its current Bi Tran system as part of the I-5/Telegraph Road Project. The City is interested in hosting an IEN client workstation. The City is also interested in viewing images from any camera in the corridor but does not want any extra equipment for this purpose.

The City does not plan to assign staff to actively monitor the system. It is anticipated that, at the most, only one operator will be working in the TMC at any one time.

The City stated that they could make an area of size 12'x3' available for the ATMS and IEN client workstations. The area would be along the walls where the 19" rack is currently located.

Figure 3-4: Potential LCC Site Location at Commerce City Hall

3.2.2 City of Downey

Figure 3-5: Downey City Hall

Under the current proposal the City of Downey Traffic Control System (TCS) will host its own signals as well as signals from the City of Montebello. The City also desires to host an IEN client workstation. In addition, the City would like to control and monitor cameras at the LCC utilizing a large screen display. The City would also like to monitor and control changeable message signs from the LCC. The City would prefer that the CMS and CCTV functions are integrated with the TCS. The primary site for City's LCC would be at their City Hall (see Figure 3-5) located at 11111 Brookshire Ave.

The City would like to deploy ATMS client and IEN client workstations at the following additional two remote locations.

- Signal Maintenance Yard
- EOC (Emergency Operations Center), located at Orange/Paramount

The City would also like to deploy an ATMS client workstation at the Police Department Dispatch Center located at 10911 Brookshire Avenue. In addition, the City would like to provide CCTV viewing capabilities to operators on their individual city workstations.

The City would like to host their LCC on the second floor in the City Hall. The City stated that they could make an area of about 230 sq foot (17'x13'6") available for this purpose. The proposed area (see Figure 3-6) is currently being used by the City staff. This area has cubicles.

Figure 3-6: Potential LCC Site Location at Downey City Hall

For this area to be converted into the LCC, the cubicles would need to be moved and walls would need to be erected. The City would like at least one wall to be all glass so that the public coming to the second floor via the existing stairs would be able to view the video wall.

The City expects to staff the LCC at City Hall with one person on a regular basis during peak hours and may have another person work in the LCC during emergencies. Thus accommodations are required a minimum of 2 operators, with the capability to expand the system to one additional user. At all other desired client locations, accommodations are necessary for only one operator.

The City has an Information Management System (IMS) room on the third floor which can be used to house the communications equipment. A 6'10"x3' workspace (See Figure 3-7) is available to rack mount the servers and networking equipment. This room has raised floors, suspended ceilings, and is climate controlled and locked.

The City stated that they would make an 6'10"x2'6" space is available for an ATMS client workstation at the Police Department Dispatch Center (see Figure 3-8).

The City would like to distribute CCTV images to authorized remote users.

The EOC and Signal Maintenance Yard is under construction, the City will make space available for ATMS client workstation and IEN client workstation after the construction is completed.

Figure 3-7: Potential Equipment Location at Downey City Hall IMS Room

Figure 3-8: Potential ATMS Client Workstation Location at Downey Police Dispatch Center

3.2.3 City of La Mirada

Figure 3-9: La Mirada City Hall

It is currently proposed to connect the City of La Mirada's signals to the future ATMS to be located at the LA County Department of Public Works. Control of the La Mirada signals would remain with the City, which means that the County ATMS would need to support multi-agency operations.

The City of La Mirada would like to host ATMS client workstations and IEN client workstations at the following two locations:

- Department of Public Works at Maintenance Yard, located at 15515 Phoebe Avenue.
- Resource Center at City Hall, located at 13700 La Mirada Boulevard (see Figure 3-9).

In addition, the City would like to view CCTV images on workstations at the Department of Public Works, City Hall and its Department of Public Safety.

One person is expected to oversee the LCC sites at each location; therefore accommodation is required for one operator per LCC site in the City.

The City identified an existing office within their Department of Public Works at the Maintenance Yard for the LCC Site (see Figure 3-10). A presently occupied cubicle, measuring 9'x5', could be made available and can be enlarged to accommodate the LCC system components by moving furniture and filing cabinets.

An alternate location discussed was a conference room that could be made available as part of a future City remodeling project. Space is not expected to be an issue at either of the targeted LCC sites. However, the first location is favored as CCTV monitors could be oriented to face the public as they enter the office.

Figure 3-10: Potential LCC Site Location at La Mirada DPW

The City also identified an existing office cubicle of size 16'x11'9" in the Resource Center at City Hall (see Figure 3-11). The cubicle currently has some office furniture which would need to be moved to accommodate LCC equipment.

Figure 3-11: Potential Remote LCC Site Location at La Mirada City Hall Resource Center

3.2.4 City of Montebello

Figure 3-12: Montebello City Hall

The City of Montebello's signals will be connected to the ATMS located at the City of Downey. The City of Montebello will host an ATMS client workstation and IEN client workstation. The City is interested in having CCTV access but does not desire any special display equipment for viewing images, simply viewing on a workstation being sufficient.

The City desires access to ATMS and IEN functions only at one location, the City Hall located at 1600 W. Beverly Boulevard (see Figure 3-12). The City is suffering from staff shortages and expects that the LCC would be staffed on an exception basis by one operator. The City's signals are maintained by an outside contractor – PEEK. The City does not require PEEK to have an ATMS client workstation.

The City identified a potential location for installation of the LCC system, a corner cubicle, with a 9'7"x7'5"" area away from direct sun light within the engineer's work area. (see Figure 3-13).

Figure 3-13: Potential LCC Site Location at Montebello City Hall

3.2.5 City of Pico Rivera

Under the currently proposed architecture, the City of Pico Rivera's signals will be connected to the ATMS server located at the City of Santa Fe Springs. The City of Pico Rivera will host an ATMS client workstation and IEN client workstation. The City is interested in CCTV access but does not desire any special display equipment for viewing images, simply viewing on a workstation being sufficient.

The City desires access to ATMS and IEN functions only at one location, the City maintenance Yard located at 6615 Passons Boulevard,

At this time, the City could not confirm the availability of space to house the LCC equipment at this location and stated that they needed internal meetings with the high level staff before this could be finalized.

3.2.6 City of Santa Fe Springs

Figure 3-13: Santa Fe Springs City Hall

The City of Santa Fe Springs will host its own ATMS Server with CCTV viewing and control functions and desires access to the IEN. In addition, the City will host the signals of the cities of Pico Rivera and Whittier. The City staff stated that it would like the Primary LCC facility to be the City maintenance Yard located at 12636 Emmens Way. In addition they would like to host an ATMS client workstation and IEN client workstation at City Hall (see Figure 3-13). CMS control/status viewing and CCTV control/viewing functions are also desired at this location. The City does not desire any special display equipment to view CCTV images at either of the facilities, simply viewing on a workstation being sufficient.

Currently the City has a dedicated DSL connection between the two facilities for their own network and stated that they could make spare DSL circuits available for ATMS purposes. The DSL circuits may not have enough bandwidth required to transfer ATMS data. The communication analysis task for this project will address this issue in the future

The City identified an area of size 5'7"x6'8" within the lab at the Yard as the location for the LCC Site. (see Figure 3-14) This lab is next to the Supervisor's office. Locating the LCC at this site will require the relocation of some furniture.

The City has not identified any particular location for placing LCC equipment at City Hall but stated that they would make the required space available in the City Hall in the future.

Figure 3-14: Potential LCC Site Location at Santa Fe Springs Maintenance Yard

3.2.7 City of Norwalk

Figure 3-15: Norwalk City Hall

The City of Norwalk will host its own ATMS Server with CCTV viewing and control functions and desires access to the IEN. The City staff stated that it would like the Primary LCC facility to be the City maintenance Yard located at 12610 Imperial Hwy., Norwalk, CA 90651. In addition they would like to host an ATMS client workstation and IEN client workstation at City Hall (see Figure 3-15). CCTV control/viewing functions are also desired at this location. The City does not desire any special display equipment to view CCTV images at either of the facilities, simply viewing on a workstation being sufficient. The City desires accommodation for just one operator as the system would be monitored on an exception basis.

Currently, the City utilizes a frame relay system to connect City Hall to the City Yard. A pilot project is also being conducted with a wireless system utilizing 802.11g Protocol and it may replace the frame relay if it is successful. It is not recommended that this connection be utilized for connecting ATMS client workstation at the City Hall with the ATMS server at the maintenance yard due to the high level of network activity that will likely be occasioned by the ATMS system.

The City identified an area of size 8’6’’x 8’ area within the signal lab at the Yard as the location for the LCC Site (see Figure 3-16). The lab is behind the administrative building. The City’s IT department’s communication equipment room in the 2nd floor of administrative building can house ATMS server and communication facilities (see Figure 3-17). There is existing conduit installed between the signal lab and the equipment room.

The potential location for ATMS client workstation and IEN client workstation at City Hall is an area of size 5’6’’x 4’ in a corner cubicle (see Figure 3-18).

Figure 3-16: Potential LCC Site Location at Norwalk Maintenance Yard

Figure 3-17: Potential Sever Location at Norwalk Maintenance Yard

Figure 3-18: Potential Remote LCC Site Location at Norwalk City Hall

3.2.8 City of Whittier

Figure 3-19: Whittier City Hall

The City of Whittier's signals will be connected to the ATMS located at the City of Santa Fe Springs. Control of the Whittier signals would remain with the City of Whittier.

The City of Whittier would like to host ATMS client workstations and IEN client workstations at the following two locations:

- Department of Public Works at City Hall, located at 13230 Penn Street. (see Figure 3-19).
- Electrical Shop at Maintenance Yard, located at 12016 Hadley Street.

The City has limited traffic engineering staff, and expects that the LCC would be staffed on an exception basis by one operator.

The City identified an existing office within their Department of Public Works at the City Hall for the LCC Site (see Figure 3-20). A presently occupied cubicle, measuring 5'6"x3', could be made available to accommodate the LCC system components by moving furniture around.

The City also identified an area of size 11'4"x3" within the electrical shop at the Maintenance Yard as the location for the LCC Site (see Figure 3-21). The shop is across the administrative office, which has the communication link to the city hall. Locating the LCC at this site will require the relocation of some furniture.

Figure 3-20: Potential LCC Site Location at Whittier City Hall

Figure 3-21: Potential Remote LCC Site Location at Whittier Maintenance Yard

4 LCC SITE RECOMMENDATIONS

This section presents recommendations for the physical layout of the LCC's at each City. The recommendations are based on the typical layouts developed in Deliverable 4.1.2 and are revised and refined based upon the LCC site analysis carried out in the task which produced this report.

Deliverable 4.1.2 developed physical layouts for the following three different types of LCCs:

- Stand Alone LCC
- LCC Hosting Additional City's field communications
- Client Only LCC

Deliverable 4.1.2 did not address remote LCC locations; these are being addressed in this report as a fourth type of LCC, the Remote Client LCC.

Sections 4.1 through 4.3 discuss the three LCC Layouts in the context of individual cities and point out how each City LCC will vary from the typical layout of that category.

4.1 Stand Alone LCC

The Cities of Commerce and Norwalk fall into this category. Both these Cities are experiencing staff shortages and plan to assign at the most one operator to the LCC on an exception basis, e.g. during emergency conditions.

4.1.1 City of Commerce

The City of Commerce has no staff resources to take-on any additional responsibility to maintain any equipment beyond the traffic control system. The City is interested in viewing CCTV images, hence the equipment for CCTV operations will need to be housed at the County.

Based on the above requirements, the following variations to the typical LCC design requirements as defined in the High Level Design have been identified:

- The LCC site will be a space within a facility (an engineer's office) and not a stand alone room.
- The requirement for a separate equipment room has been deleted.
- Space needs to be provided only for one operator – only one ATMS client workstation needs to be provided.
- Separate storage will not be required. Instead, the storage for manuals and reference materials shall be accommodated within City's existing furniture.
- No fax equipment is recommended at this time since the staff can utilize their existing machines for this purpose.

Figure 4-1 presents the revised LCC layouts for the City of Commerce. Please note that the only furniture recommended is a desk console and two 19 inch racks.

4.1.2 City of Norwalk

The City of Norwalk is willing to take responsibility to maintain additional devices such as CCTV but would like the central equipment associated with their operation to be minimized. For example, this could be achieved by integrating CCTV and TCS operations.

Based on the above requirements, the following variations to the typical LCC design requirements as defined in the High Level Design have been identified:

- The LCC site will be a space within a facility (a signal lab) and not a stand alone room.
- The equipment room of IT Department will be used for housing the ATMS and IEN servers and communication equipment.
- Space needs to be provided only for one operator – only one ATMS client workstation needs to be provided.
- Separate storage will not be required. Instead, the storage for manuals and reference materials shall be accommodated within City's existing furniture.
- No fax equipment is recommended at this time since the staff can utilize their existing machines for this purpose.

Figure 4-2 presents the revised LCC layouts for the City of Norwalk. Please note that the only furniture recommended is a desk console and two 19 inch racks.

Table 4-1 provides an example equipment list for both cities. The City of Norwalk may need more equipment to accommodate CCTV operations, amount of extra equipment will depend upon how these devices are integrated with the traffic control system.

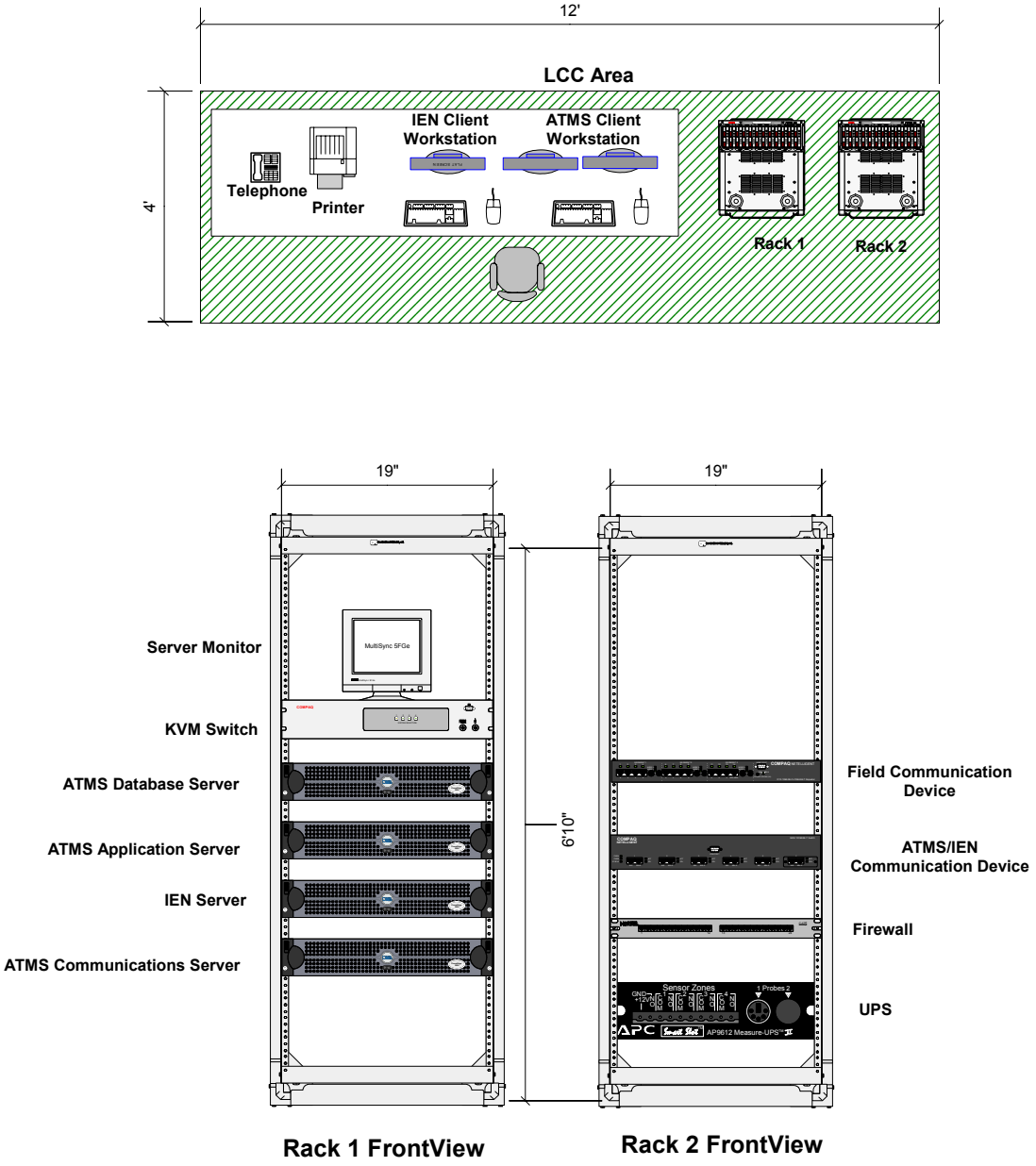
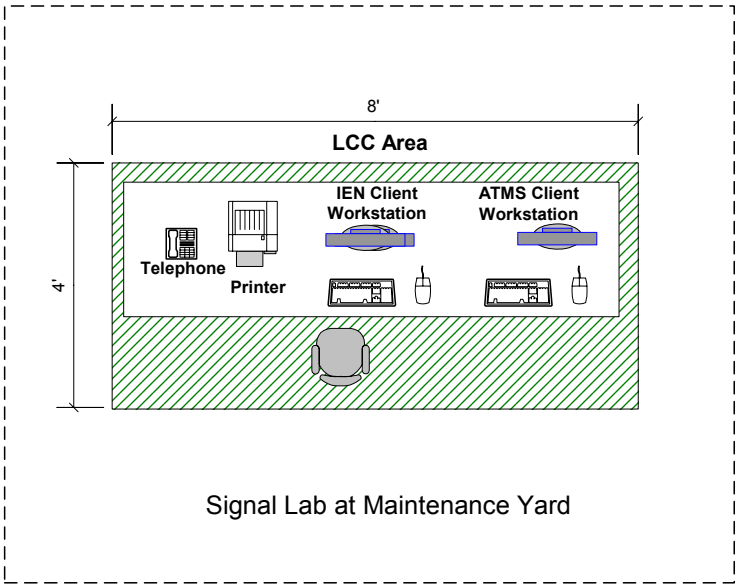


Figure 4-1: LCC Layouts for the City of Commerce



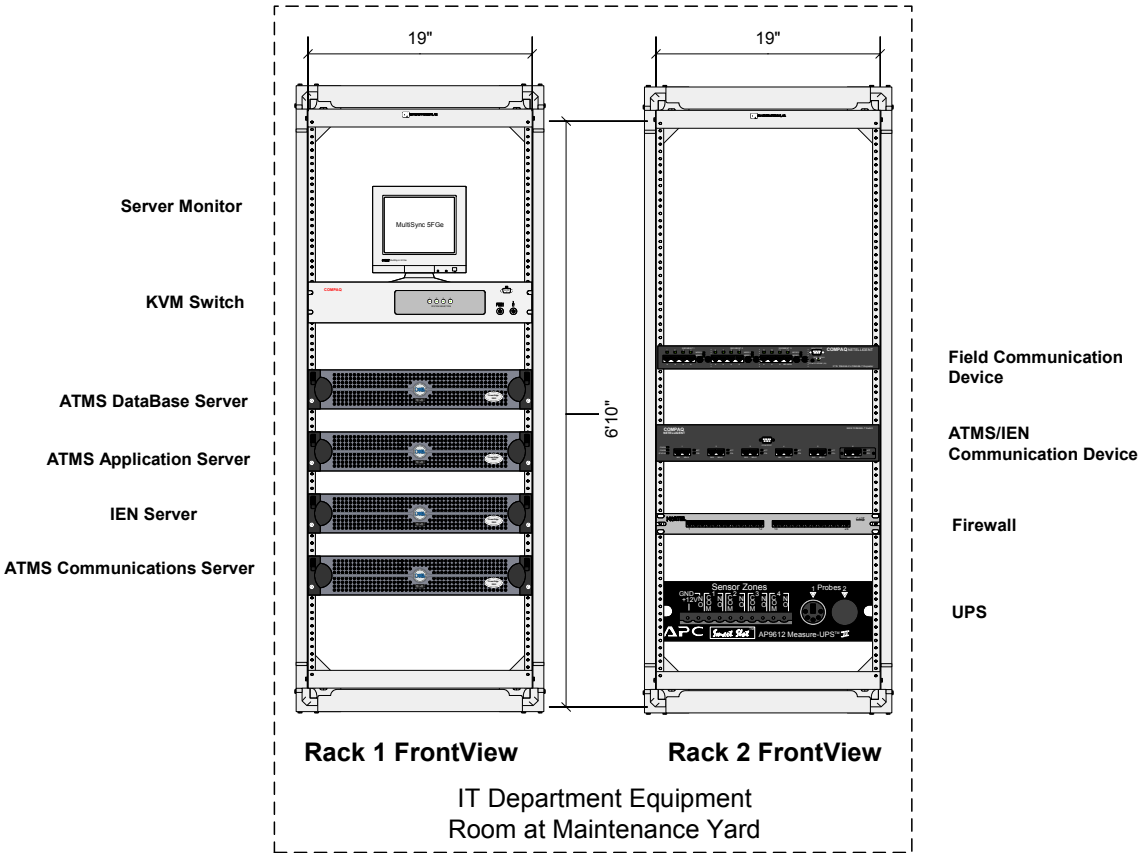


Figure 4-2: LCC Layouts for the City of Norwalk

Table 4-1: Example LCC Equipment List for City of Commerce & Norwalk

Description	Unit	Quantity
Hardware System:		
ATMS Application Server	Ea	1
ATMS Database Server	Ea	1
ATMS Communications Server	Ea	1
ATMS Client Workstation	Ea	1
IEN Server	Ea	1
IEN Client Workstation	Ea	1
ATMS/IEN Communication Device	Ea	1
Field Communication Device	Ea	1
Firewall	Ea	1
Server KVM Switch	Ea	1
Server Monitor	Ea	1
UPS	Ea	1
Flat Panel Monitor (19”)	Ea	3
Printer	Ea	1
Telephone	Ea	1
Furniture:		
19” Rack	Ea	2
Desk Console	Ea	1
Chair	Ea	1
Misc:		
Cable, Connector, etc	LS	
Power Strip	Ea	4

4.2 LCC Hosting Additional City's Signals

Both the City of Downey and City of Santa Fe Springs fall into this category. The County also falls into this category but the County TMC design is beyond the scope of this project since the County's hosting responsibilities potentially involve a large number of agencies from other Forums also.

4.2.1 City of Downey

The City plans to staff the LCC with one operator during peak hours and with an additional operator during emergencies.

The LCC will be located in the space identified by the City. This will require items such as office furniture (drafting table, file cabinet, etc.) occupying two cubicles to be relocated. This will provide an operational workspace of 230 square feet. This workspace can be secured with the installation of office walls with a lockable entry door.

A desk console is recommended for the LCC. This console will provide accommodation initially for two operators and will house three workstations (two for ATMS clients and one for IEN client). The space is sufficient to accommodate a third operator if needed.

The Video display equipment will comprise a 60inch plasma display. Brackets may be necessary to mount the video display equipment. To enable the public to view the video displays, a glass wall is recommended for the wall facing the counter. Thermal and acoustic impacts will be calculated in the detailed design report. Additional AC power receptacles and communications media are needed to support this workspace.

Based on the City's suggestion, all communications equipment and server computers will be housed in the IMS room located on the third floor of the City Hall.

The key variations from the typical layout as defined in the High Level Design are as follows:

- The Equipment room is located on a different floor instead of next to the LCC requiring a split between the equipment
- Accommodation is provided initially for two operators – thus two ATMS client workstations are provided instead of three

Figures 4-3 and 4-4 provide the layouts for the LCC Site and MIS room respectively. Table 4-2 provides an example equipment list.

Please note that at this time, provision is made for separate communications servers for the Cities of Downey and Montebello. Depending upon the ATMS system chosen it may be possible to combine the signals from the two cities on one server.

It should be noted that the location of communication equipment for hosted cities is not yet known. This determination will be made during the conceptual design based on specific communications requirements.

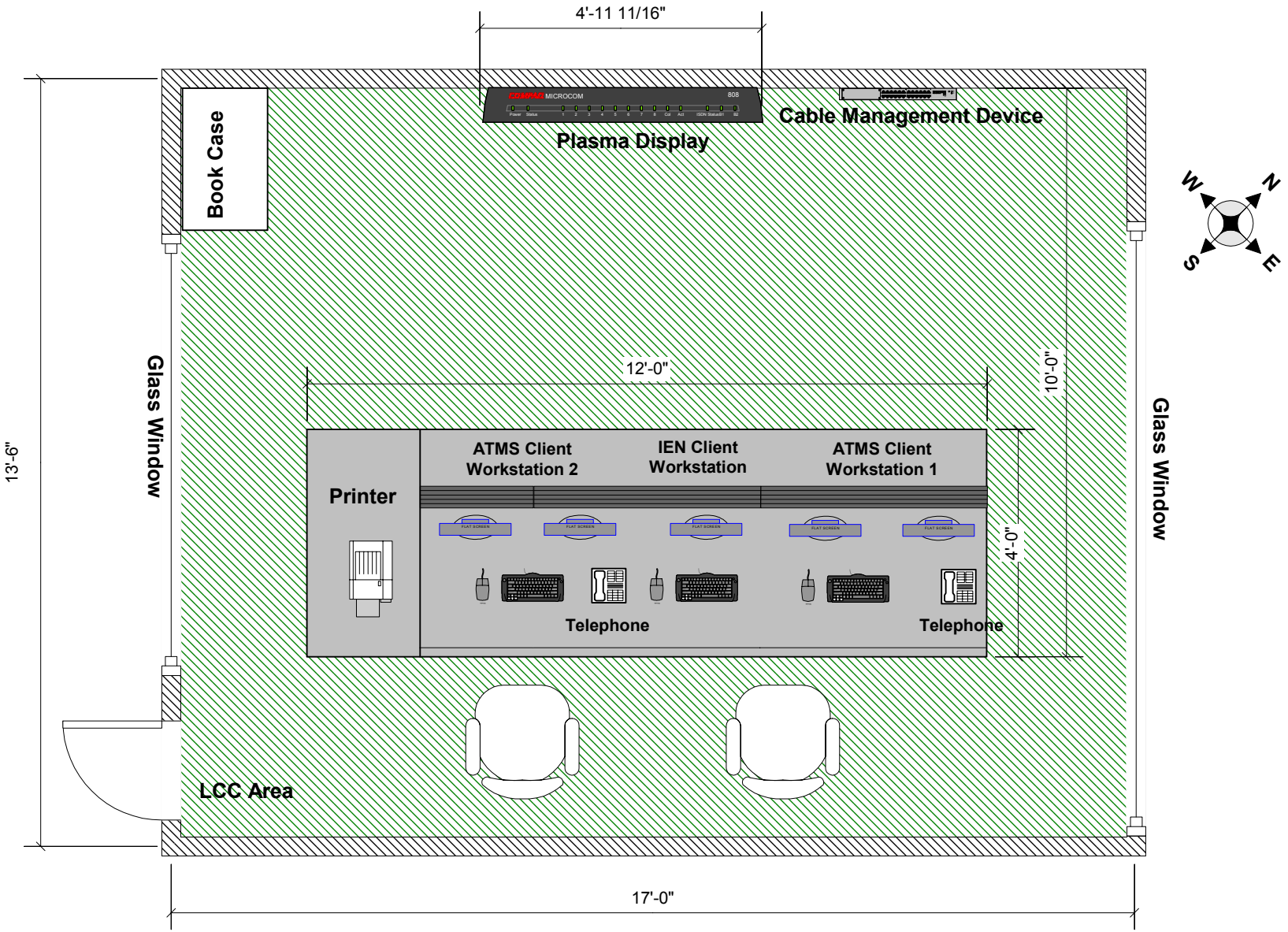


Figure 4-3: LCC Layout for the City of Downey 2nd Floor

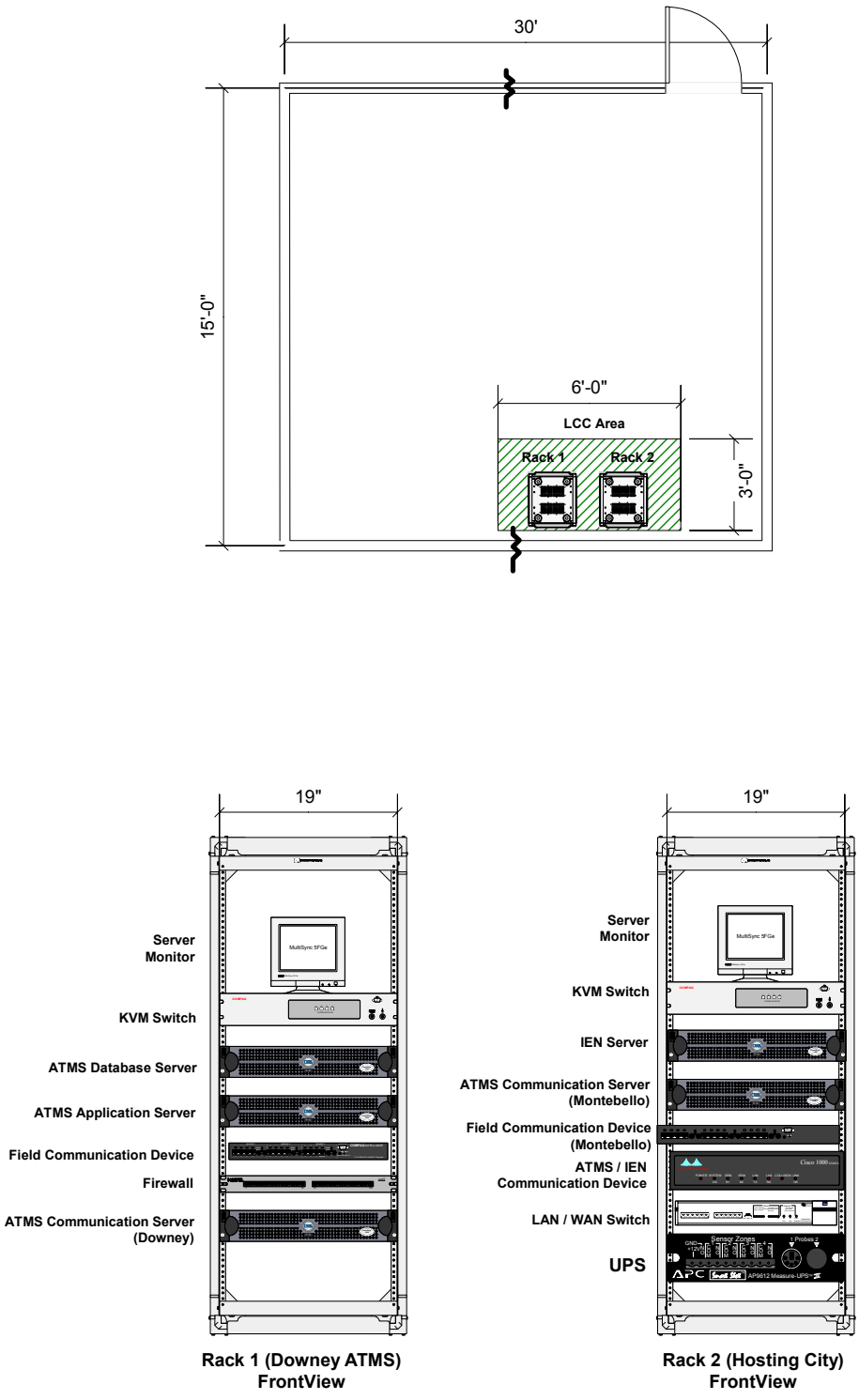


Figure 4-4: LCC Layout for the City of Downey 3rd Floor

Table 4-2: LCC Equipment List for City of Downey

Description	Unit	Quantity
Hardware System:		
ATMS Application Server	Ea.	1
ATMS Database Server	Ea	1
ATMS Client Workstation	Ea	2
IEN Server	Ea	1
IEN Client Workstation	Ea	1
ATMS Communication Server	Ea	2
ATMS/IEN Communication Device	Ea	1
LAN/WAN Switch	Ea	1
Field Communication Device	Ea	2
Firewall	Ea	1
Server KVM Switch	Ea	1
Server Monitor	Ea	2
UPS	Ea	1
Flat Panel Monitor (19”)	Ea	5
Plasma TV (61”)	Ea	1
Cable Management Device	Ea	1
Printer	Ea	1
Telephone	Ea	2
Furniture:		
19” Rack	Ea	2
Desk Console	Ea	1
Bookcase	Ea	1
Chair	Ea	2
Misc:		
Cable, Connector, etc	LS	
Power Strip	Ea.	6

4.2.2 City of Santa Fe Springs

The LCC will be located in the signal lab at the Maintenance Yard. The lab has enough space to house one desk console and two 19" racks. The City of Santa Fe Springs is willing to take the responsibility to maintain additional devices such as CMS and CCTV but would like the central equipment associated with their operation to be minimized and for operations to be integrated as much as possible.

Figure 4-5 presents the LCC layout for the City of Santa Fe Springs. Table 4-3 presents the equipment list of the City of Santa Fe Springs.

Table 4-3: LCC Equipment List for City of Santa Fe Springs

Description	Unit	Quantity
Hardware System:		
ATMS Application Server	Ea.	1
ATMS Database Server	Ea	1
ATMS Client Workstation	Ea	2
IEN Server	Ea	1
IEN Client Workstation	Ea	1
ATMS Communication Server	Ea	3
ATMS/IEN Communication Device	Ea	1
LAN/WAN Switch	Ea	1
Field Communication Device	Ea	2
Firewall	Ea	1
Server KVM Switch	Ea	1
Server Monitor	Ea	2
UPS	Ea	1
Flat Panel Monitor (19”)	Ea	5
Cable Management Device	Ea	1
Printer	Ea	1
Telephone	Ea	2
Furniture:		
19” Rack	Ea	3
Desk Console	Ea	1
Bookcase	Ea	1
Chair	Ea	2
Misc:		
Cable, Connector, etc	LS	
Power Strip	Ea.	6

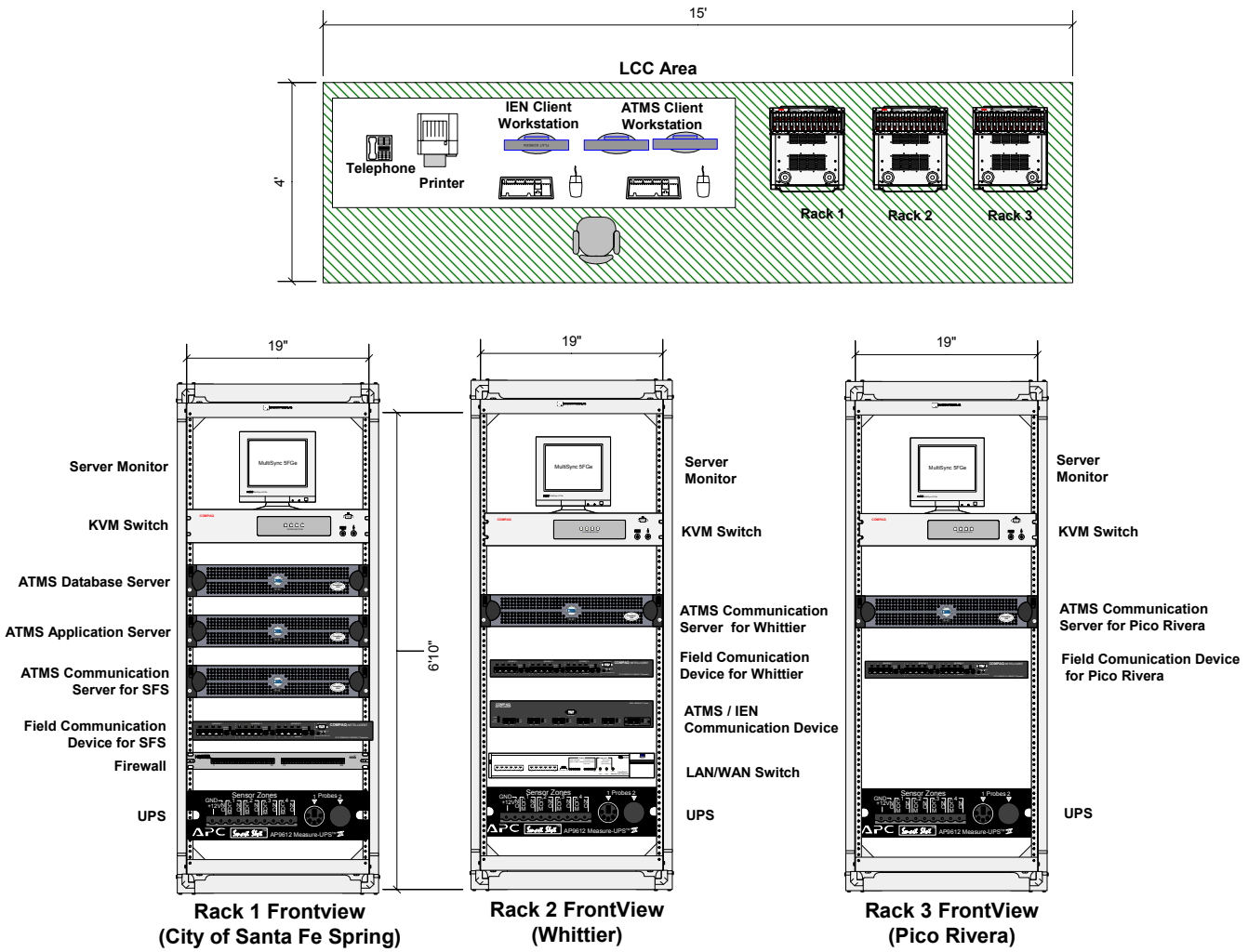


Figure 4-5: LCC Layouts for the City of Santa Fe Springs

4.3 Client Only LCC

The cities of La Mirada, Montebello, Pico Rivera and Whittier fall into this category. Based on the analysis in the previous sections, the LCC at these cities would consist of an ATMS client workstation, and an IEN client workstation. It is recommended that the ATMS client workstation be equipped with two flat panel monitors, this will allow the operator more viewing area for traffic the control system and/or split the viewing area with CCTV images.

There is no need to provide separate fax equipment at these facilities as the LCC site will be located in the existing offices and the staff could utilize the existing fax equipment.

Figure 4-6 provides the layouts for the LCC Site and Table 4-4 provides the associated equipment list.

4.4 Remote LCC

A remote LCC would typically have the same layout as the Client Only LCCs except that the ATMS client workstation in these facilities could be equipped with one flat panel monitor instead of two to reflect the difference in intended use of the facility.(i.e. as the use of these facilities would be low). The following cities will have Remote (secondary) LCC sites in addition to the Primary LCC sites:

- Downey
- La Mirada
- Norwalk
- Santa Fe Springs
- Whittier

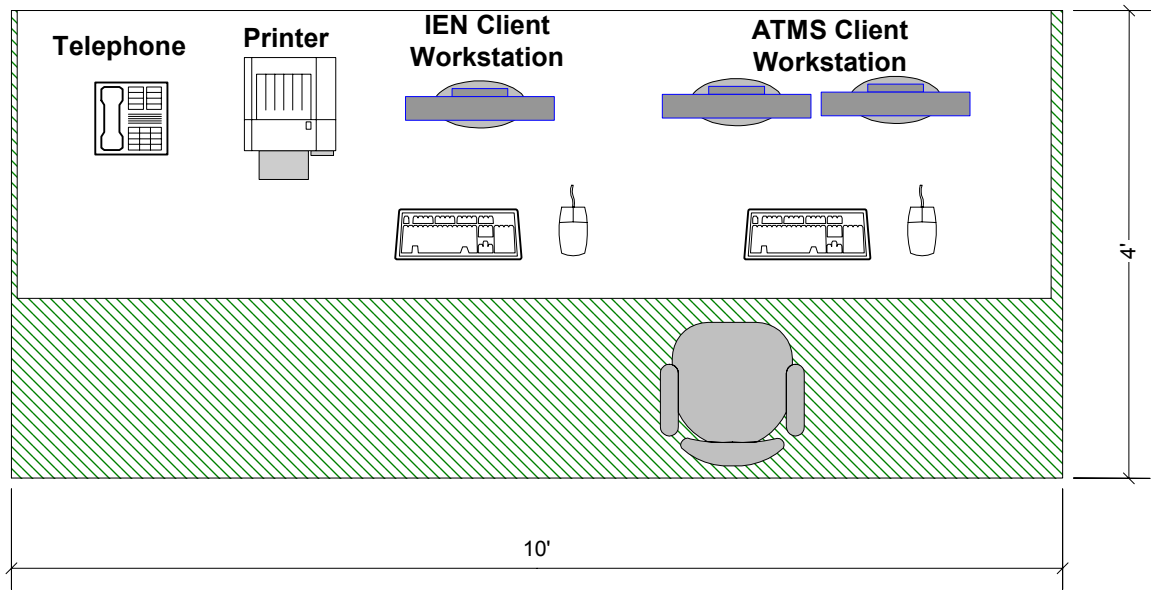


Figure 4-6: LCC Layout for the Cities of La Mirada, Montebello, Pico Rivera & Whittier

Table 4-3: LCC Equipment List for Cities of La Mirada, Montebello, Pico Rivera & Whittier

Description	Unit	Quantity
Hardware System:		
ATMS Client Workstation	Ea	1
IEN Client Workstation	Ea	1
Flat Panel Monitor (19”)	Ea	3
Printer	Ea	1
Telephone	Ea	1
Furniture:		
Desk Console	Ea	1
Chair	Ea	1
Misc:		
Cable, Connector, etc	LS	
Power Strip	Ea.	2

Appendix A
Agency Interview Meeting Minutes

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of Commerce
Meeting Minutes
July 24, 2002

Attendees:

William O. McConnell	City of Commerce
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: City Hall of Commerce, 2535 Commerce Way. Commerce, CA 90040

LCC Systems:
It was confirmed that the City of Commerce will host its own ATMS and would like to host an IEN workstation in one LCC site.

The TCS required by the City is the latest upgrade to the currently installed Bi-Tran traffic control system. Due to extreme staff and space limitations, an interface with the CCTV should be via a single system that could host multiple applications. The IEN system component should continue to remain independent.

Staff
It is not expected the City will assign personnel to actively monitor and maintain the LCC systems. Therefore, accommodations are only needed for one person.

Communications
Nearly all signals are interconnected via hardwire, with the exception of the Malt and Garfield intersections along Telegraph Road. The City has conduit to this location and would like hardware to be installed as part of the I-5 / Telegraph Road Corridor Project.

LCC Control Room
Approximately 1/3 of a presently unoccupied office could be made available to the LCC system components. The office is 12x12x9 (LWH), with approximately a 9x3x9 area available to install the LCC system components. This arrangement assumes a file cabinet would be moved and integrated with the City filing system that is under planning. No display equipment, other than one 19" flat panel LCD monitor for the IEN and one 19" flat panel LCD monitor for the ATMS, is desired.

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of Downey
Meeting Minutes
July 24, 2002

Attendees:

Anthony M. La	City of Downey
Steven Yanez	City of Downey
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: City Hall of Downey, 11111 Brookshire Ave. Downey, CA 90241-7016

LCC Systems:
It was confirmed that the City of Downey City Hall site will host its own ATMS and will host the traffic signals from the City of Montebello and the City of Pico Rivera. The City also desires to host an IEN workstation. In addition, the City would like CCTV monitoring through the web at their remote locations. The City would like ATMS client workstations and IEN client workstations at the following additional locations:

- Signal Maintenance Yard
- EOC (Emergency Operations Center), located at Orange/Paramount
- Remote users desktop (with authentication)
- Police department dispatch center

The lowest priority of service is needed for remote users. All other users are expected to be serviced by an optimal level of bandwidth and system resources.

The system that provides for management of the CMS is not necessarily a stand-alone system; this functionality may be a component within the TCS software. Should the CMS operate as stand-alone, it is likely to be co-hosted on the workstation of another system, such as TCS. The CCTV management functions are expected to be hosted by separate equipment.

Staff
At the City Hall, one person is expected to oversee the LCC room, with another person supporting during peak periods. Accommodations are required for up to 2 simultaneous operators, with the capability to expand the system to additional users. At all other locations, accommodations are necessary for only one operator.

Communications
The demarcation point between the LCC's and the field communications is proposed to be located at a pull box external to the City Hall. Therefore, the LCC communications are considered to be all media, hardware, and software from the pull-box to within the LCC and the monitoring locations referenced above.

The benefits of designating Paramount Boulevard as a backbone link within a fiber optic network was discussed. This would enable a closure of a City loop for fiber optic thereby allowing for path redundancy in the LCC field communications network.

LCC Control Room (City Hall site)

The City would like to build a room for LCC on the second floor of the City Hall. The space they want to use is currently being used by other city staff, but city will make that space available for LCC. A wide screen LCD flat panel video wall with two additional smaller monitors is desired for monitoring the CCTV and traffic data. Display equipment should be at the front desk, so the public could view the monitors while providing the operators a degree of privacy.

The city also suggested that their MIS computer room is located on the third floor and can house all the equipment required, the servers, disk storage, and communications equipment related to ATMS. The third floor equipment room has enough space and has easy access to second floor.

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of Montebello
Meeting Minutes
July 25, 2002

Attendees:

Jose Loera	City of Montebello
Michael Ho	City of Montebello
Pat Smith	Department of Public Works, Los Angeles County
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: City Hall of Montebello, 1600 West Beverly Blvd. Montebello, CA 90640-3932

LCC Systems:
It was confirmed that the City of Montebello will host an ATMS client workstation and would like to host an IEN client workstation. Further, it was confirmed that the City of Downey would host the City of Montebello's traffic signals.

The City traffic signal systems are maintained under contract by Peek. The City of Montebello does not desire to provide its signal system contractor with remote access to the ATMS. No other monitoring locations are desired.

Staff
Although a specific person is not presently identified, the City indicated that at most one person would occasionally monitor the client workstations. City monitoring would likely be on an exception basis, when alarms are triggered during normal business hours. During off hours, it was suggested that the signal maintenance contractor be paged or notified. Due to staff and space limitations, an interface with the CCTV should be via a single system that could host multiple applications.

Camera Locations
The City recommended the following camera locations:

- Washington at Greenwood
- Telegraph at Greenwood
- Telegraph at Slauson

Communications
The City of Montebello traffic signal systems will be connected to the City of Downey. The City of Montebello will retain control of their signals, administered over a center-to-center connection between City Hall locations.

LCC Control Room

Two potential locations are available for installation of the LCC system. The first alternative is approximately 69” x 36” area, near windows in a relatively high traffic, visible corner office. The second location is in a corner cubicle, with a 115” x 89” area, in less direct light with greater privacy. Both locations are suitable for hosting all necessary equipment and can be fitted with electrical and communications facilities. As this project matures from Conceptual Design to Deployment, the City will open one of these locations for installation of the LCC equipment.

No display equipment, other than one 19” flat panel LCD monitor for the IEN and one 19” flat panel LCD monitor for the ATMS, is desired.

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of Santa Fe Springs
Meeting Minutes
July 25, 2002 & August 7,2002

Attendees:

Thomas R. Lopez	City of Santa Fe Springs
Pat Smith	Department of Public Works, Los Angeles County
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: City Hall of Santa Fe Springs, 11710 Telegraph Road. Santa Fe Springs, CA 90670-3679

LCC Systems:
It was confirmed that the City of Santa Fe Springs will host its own ATMS server and would like to host an IEN workstation at its Maintenance Yard facility. In addition, the City is interested in ATMS client workstations and IEN client workstations at City Hall. . CCTV monitoring through the web is desired at the remote location (City Hall).

The Client systems provide remote access to the ATMS and IEN systems. The City proposed the LCC server equipment be located at Maintenance Yard (12636 Emmens Way), with a dedicated communications connection (spare DSL circuit) to the City Hall. The City Hall system should have Client workstations for monitoring.

Staff
The City is not expected to assign a person to monitor the LCC systems continuously at either of the two locations. It is expected that personnel in the Maintenance Yard will monitor and access the ATMS components as necessary. Thus, accommodations are required for just one person at each location.

Communications
By mid-August, the City expects to have a Wide Area Network (WAN) operational, with the network server located at City Hall. The Maintenance Yard has an available DSL circuit that can enable a connection between the City Hall client workstations and the LCC server systems at the Maintenance Yard.

LCC Control Room
No video wall is desired at either City Hall or the Maintenance Yard. Two display monitors are considered adequate for both systems.

August 7: Meeting with Thomas Lopez, Steven Teays, Alex Rodriguez at Maintenance Yard for LCC Control Room issue.

It was suggested that the LCC Should be located in the lab at the Yard, next to Alex's office. The lab has enough space to accommodate for necessary equipment, the city will need to move a couple of tables.

Since City of Santa Fe Springs is contracted to maintain signals for City of Pico Rivera, It is suggested that Santa Fe Springs has the capability to monitor the signal conditions in Pico Rivera.

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of Pico Rivera
Meeting Minutes
July 26, 2002

Attendees:

Enrique Acevedo	City of Pico Rivera
Michael Moore	City of Pico Rivera
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: City Hall of Pico Rivera, 6615 Passons Blvd. Pico Rivera, CA 90660-1016

LCC Systems:
It was confirmed that the City of Downey will host the City of Pico Rivera traffic signals. The City of Pico Rivera would like to host the ATMS client workstation and the IEN client workstation at the City Yard. No other monitoring locations are desired.

Staff
The City Traffic Engineering is not expected to assign someone to actively monitor the LCC systems; therefore only remote (Client) access to the ATMS and IEN is desired at the City Yard with accommodations for one person.

Communications
n/a

LCC Control Room
The recommendation for the Maintenance Yard as the location for hosting the LCC server systems is contingent on the availability of space and a follow up meeting with the management of this facility.

No video wall is anticipated as necessary at the Maintenance Yard. Two 19" LCD flat panel display monitors are considered adequate for both systems.

SIEMENS

I-5 / Telegraph Road Corridor Project
LCC Location Recommendations
City of La Mirada
Meeting Minutes
July 29, 2002

Attendees:

Steve Forster	City of La Mirada
Arti Gupta	Siemens GTS
Eknauth Persaud	Siemens GTS
Charlie Zhu	Siemens GTS

Address: Public Works, 15515 Phoebe Ave. La Mirada, CA 90638

LCC Systems:
It was confirmed that the City of La Mirada intends for its traffic signals to be connected to an ATMS server located at the LA County Department of Public Works. Control of the La Mirada signals will remain with the City. The City of La Mirada would like to host the ATMS client workstations and IEN client workstations at both the City Resource Center and Maintenance Yard. In addition, the City would like to enable CCTV monitoring, preferably over the web, at the Department of Public Safety.

Staff
One person is expected to oversee the LCC room at each location, therefore accommodations are required for one operator per LCC site in the City. The traffic signal systems are maintained by a private contractor; ATMS alarms are expected to page the signal contractor as a primary, with the City receiving a secondary (lower priority) page.

CCTV Locations
The City recommended the following camera locations:

- Valley View at Alondra
- Valley View at Rosecran
- Valley View at Imperial
- La Mirada at Imperial
- Alondra at Imperial
- Santa Gertrudes at Imperial

Maintenance of City CCTV cameras is anticipated to be performed on a subcontract basis.

Communications
n/a

LCC Control Room
Two flat panel 19" LCD monitors are preferred for CCTV viewing, rather than a video wall. Space is not expected to be an issue at any of the desired LCC sites. At

Maintenance Yard, the recommended location for the LCC equipment is in the lobby area, in a cubicle facing customers as they walk into the facility.