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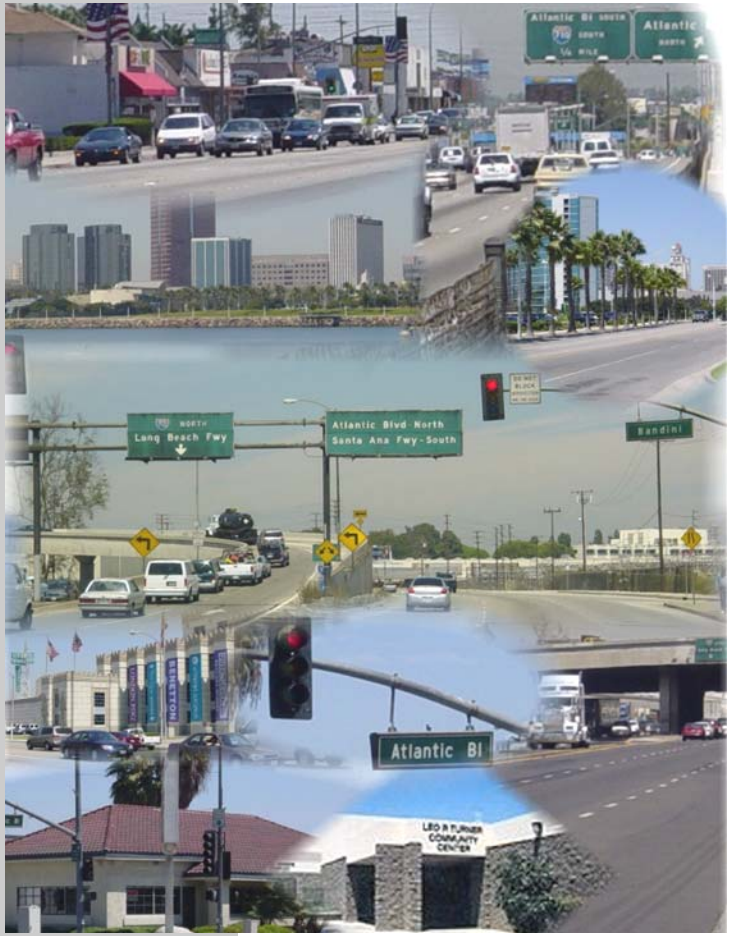

Gateway Cities Traffic Signal Synchronization and Bus Improvement Project

I-710/Atlantic Blvd

Stakeholders Meeting
Los Angeles County Department of Public Works
February 8, 2007

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Agenda

- Introductions
- Project Overview
- System Architecture
- Conceptual Design Plan Recommendations
- Implementation Plan Recommendations

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Project Objectives

- Provide signal operations and management capability for all participating agencies in the project area
- Coordinate traffic signal management operations among participating agencies
- Exchange traffic information between the local cities and regional agencies.

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Project Elements

- Advanced Traffic Management Systems (ATMS)
- Traffic Controllers
- Vehicle Detection Systems
- Closed Circuit Television Cameras (CCTV)
- Local Control Centers
- Information Exchange Network (IEN)
- Video Distribution System
- Communications Network

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Project Stakeholders

- City of Bell
- City of Bell Gardens
- City of Commerce
- City of Compton
- City of Cudahy
- City of Huntington Park
- City of Long Beach
- City of Lynwood
- City of Maywood
- City of Paramount
- City of Signal Hill
- City of South Gate
- City of Vernon
- Los Angeles County Department of Public Works (LA County)

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Project Steps

- Identifying Agency Needs
- Requirements Analysis
- High Level Design
- Alternative Analysis and Recommendations
- Conceptual Design
- Implementation Plan
- Operations and Maintenance Plan

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Agency Operations Categories – Level 1

- Level 1:
  - Agency does not operate its traffic signals
  - Agency wants to be “Agency B” on other Agency’s ATMS
  - Another Agency operates its traffic signals (e.g., L.A. County DPW)
  - Agency is provided with IEN workstations to monitor traffic signals and incident management activities
  - No separate ATMS workstation is provided for the agency

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Agency Operations Categories – Level 2A

- Level 2A:
  - Agency does not actively operate its traffic signals.
  - Agency typically operates on an exception basis and occasional peak periods.
  - Agency wants to be “Agency B” on other Agency’s ATMS
  - Another Agency may operates its traffic signals (e.g., L.A. County DPW)
  - Agency is provided with ATMS client workstation to monitor traffic signals and incident management activities.
  - Separate IEN workstation is provided for the agency.

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Agency Operations Category – Level 2B

- Level 2B:
  - Agency actively manages and operates its own ATMS
    - Actively manage ATMS during exceptions and peak periods
    - Passively manage ATMS during off-peak periods
  - Agency may operate some other ITS devices
  - Agency houses an IEN Local Control Center to manage traffic signals and incident management activities
  - IEN Workstation – Regional View
  - ATMS Workstation – Local View
  - CDI between the ATMS and IEN

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Agency Operations Category – Level 3

- Level 3:
  - Agency actively manages and operates its own ATMS and other ITS devices.
    - Typically AM peak through PM peak operations
    - May support 24/7 operations
  - Agency may operate other agency's traffic signals (Level 1)
  - Agency may "host" other agency's traffic signals (Level 2A)
  - Agency will have a traffic management center (TMC) from which to operate ATMS workstations, IEN workstations, and other ITS devices
  - Agency houses an IEN local control center to manage traffic signals and incident management activities
  - IEN workstation – regional view
  - ATMS workstation – local view
  - CDI between the ATMS and IEN

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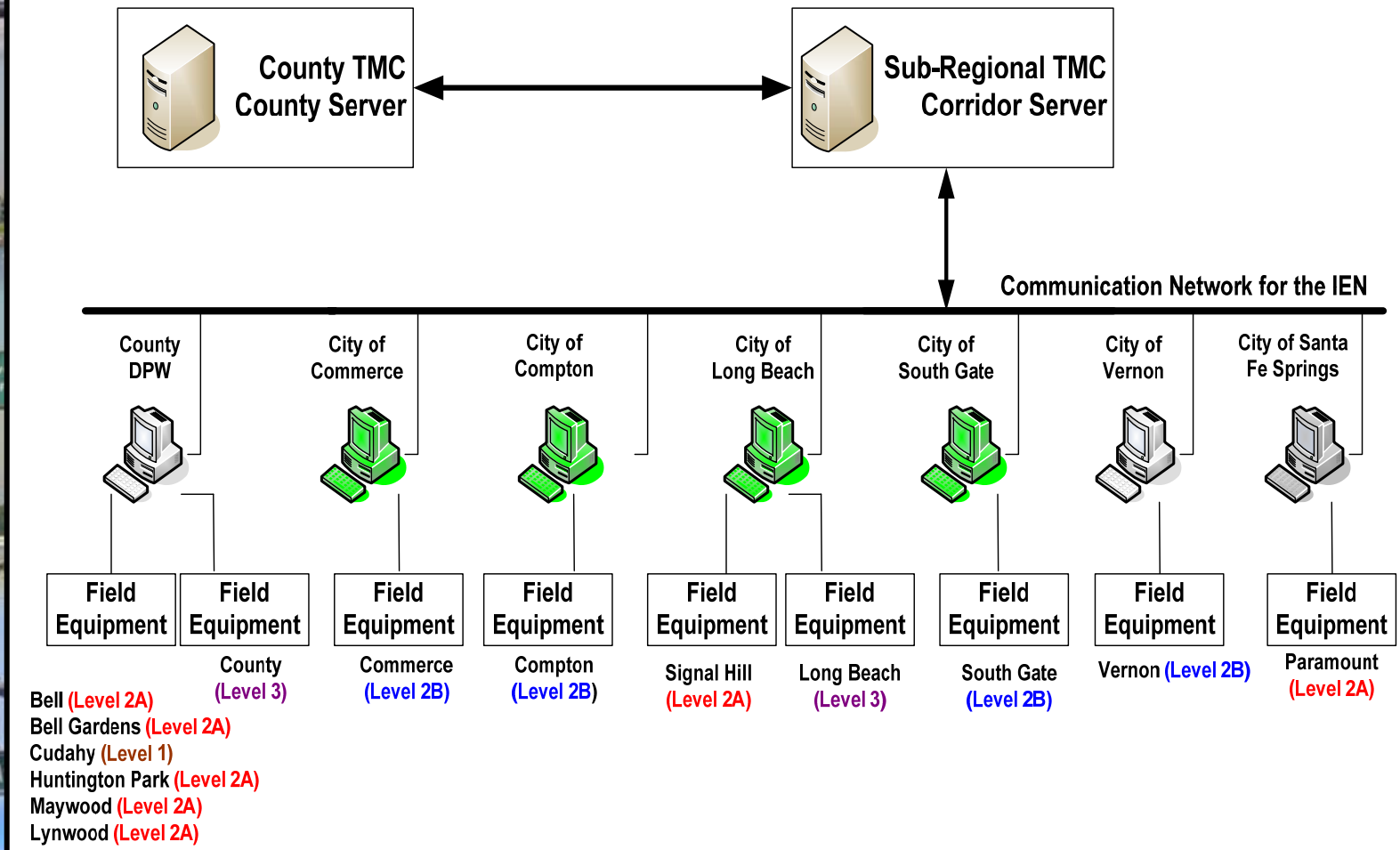
System Architecture



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Conceptual Design Plan Recommendations
Advanced Traffic Management Systems (ATMS)

- Cities of Bell, Bell Gardens, Huntington Park, Lynwood, Maywood, Paramount and Signal Hill will have their Signals connected to LA County System (KITS)
- City of Vernon's ATMS will be upgraded to either ***i2***, KITS, MIST, or Transuite
- City of Long Beach will continue to use its existing system (QuickNet IV) and will continue to host Signal Hill's signals
- Cities of Huntington Park, Lynwood, Maywood ,and Vernon will have additional ATMS workstations at remote sites

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Conceptual Design Plan Recommendations

Information Exchange Network (IEN)

- Cities of Bell, Bell Gardens, Cudahy, Huntington Park, Lynwood, Maywood, and Paramount will have their IEN workstations connected to LA County IEN server
- Cities of Huntington Park, Lynwood, Maywood, and Vernon will have additional IEN workstations at remote sites
- New CDIs will be deployed for the cities of Long Beach, Vernon, and Compton

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Conceptual Design Plan Recommendations
Video Distribution

- Web-based video distribution system based on I-5/Telegraph Road project recommendations
- New video servers for cities of Commerce, Compton, Long Beach, and Vernon
- Cameras in the cities of Bell Gardens and Lynwood to be connected to the County video server
- South Gate and County video servers to be deployed as part of other FORUM projects

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Conceptual Design Plan Recommendations

Signal Controller Upgrades

- Rationale for upgrade
  - Controller cannot communicate with a central traffic control system.
  - Consistent with existing equipment

- 228 signal controllers are recommended for upgrade:
  - 102 Type 170 upgrades.
  - 83 Type 170 E upgrades
  - 43 NEMA upgrades

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Conceptual Design Plan Recommendations
Closed Circuit Television Cameras (CCTV)

- All 104 major intersections in the project area analyzed
  - Traffic volume
  - Level of service
  - Accident rates
  - Proximity to freeway ramps
- Cameras recommended at 20 locations:
  - Bell - 1
  - Bell Gardens – 2
  - Commerce – 3
  - Compton -6
  - Lynwood -4
  - Long Beach -1
  - Maywood - 1
  - South Gate – 1
  - Vernon – 1

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Conceptual Design Plan Recommendations

Closed Circuit Television Cameras (CCTV) Locations

Agency	CCTV Location
Bell	Atlantic Ave./Florence Ave.
Bell Gardens	Eastern Ave./Garfield Ave.
	Eastern Ave./Florence Ave.
Commerce	Eastern Ave./Slauson Ave.
	Atlantic Blvd./Washington Blvd.
	Bandini Blvd./Garfield Ave.
Compton	Alondra Blvd./Atlantic Ave.
	Artesia Blvd./Central Ave.
	Wilmington Ave./Rosecrans Ave.
	Central Ave./El Segundo Blvd.
	Alameda St./Compton Blvd.
	Long Beach Blvd./Rosecrans Ave.
Long Beach	Del Amo Blvd./Long Beach Blvd.
Lynwood	M.L.K. Jr. Blvd./Imperial Hwy.
	Atlantic Ave./Imperial Hwy.
	Alameda St./Imperial Hwy.
	Long Beach Blvd./Imperial Hwy
Maywood	Atlantic Blvd./Slauson Ave.
South Gate	Santa Fe Ave./Firestone Blvd.
Vernon	Atlantic Blvd./Bandini Blvd.

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Conceptual Design Plan Recommendations
System Detection

- A number of detection technologies analyzed
  - Loops, VIDS, RTMS found to be most suitable
  - Loops found to be most accurate and widely deployed in the project area.
- All major intersections in the project area analyzed for:
  - Installing new system detectors
  - Rewiring existing advanced detectors
  - Using existing advanced detectors
- No locations with existing usable advanced detectors
- 68 locations identified for new system detectors
- 26 intersection approaches recommended for re-wiring
- For cost purposes, no installation of new system detection devices is considered

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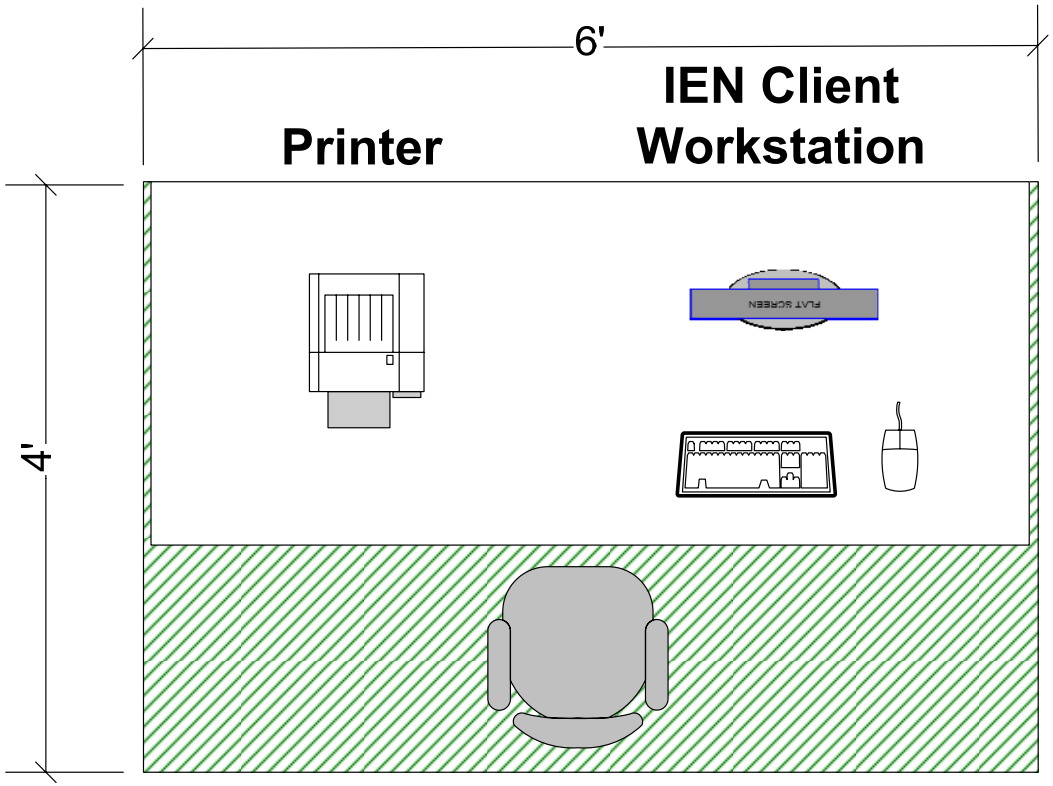
Conceptual Design Plan

Recommendations Local Control Centers (LCC) – Level 1

- Cities with only IEN client workstation – Cudahy



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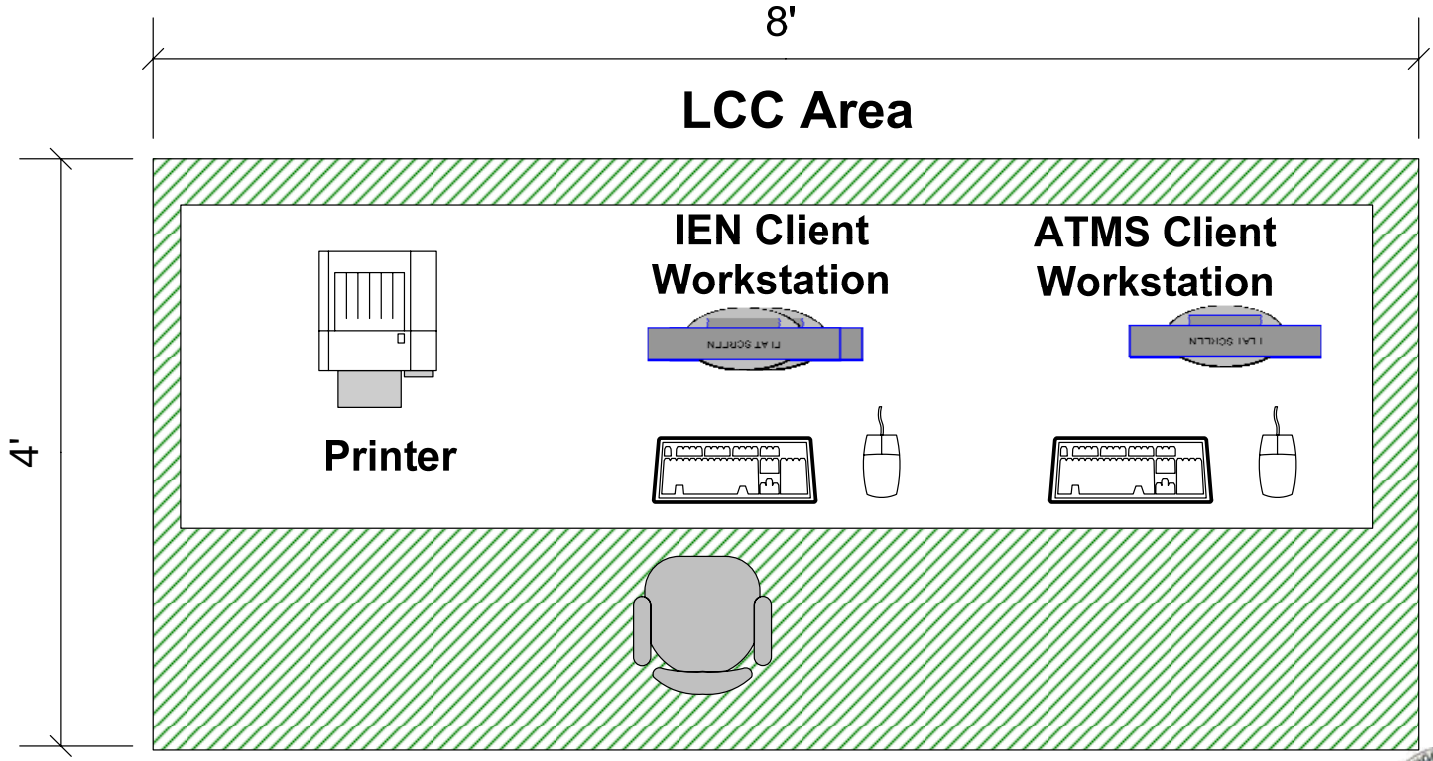
Conceptual Design Plan Recommendations
Local Control Centers (LCC) – Level 2A

- Cities with ATMS and IEN Client Workstations: Bell, Bell Gardens, Huntington Park, Lynwood, Maywood, Signal Hill and Paramount.
- Paramount LCC will be equipped as part of I-105 Corridor project



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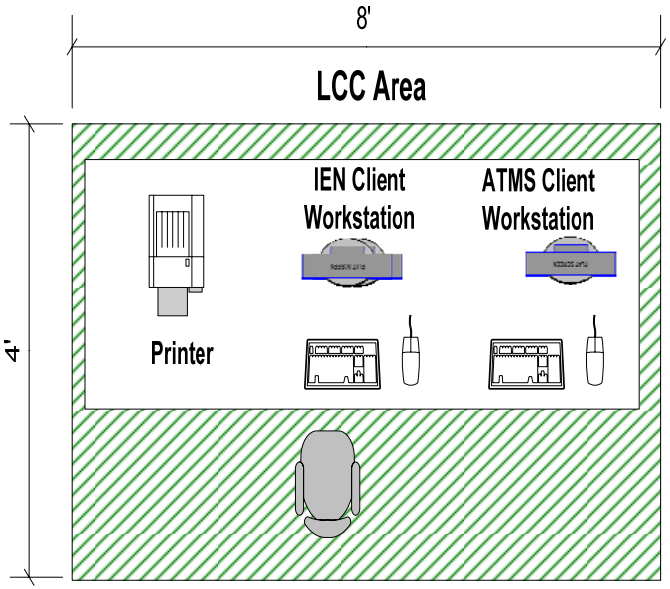
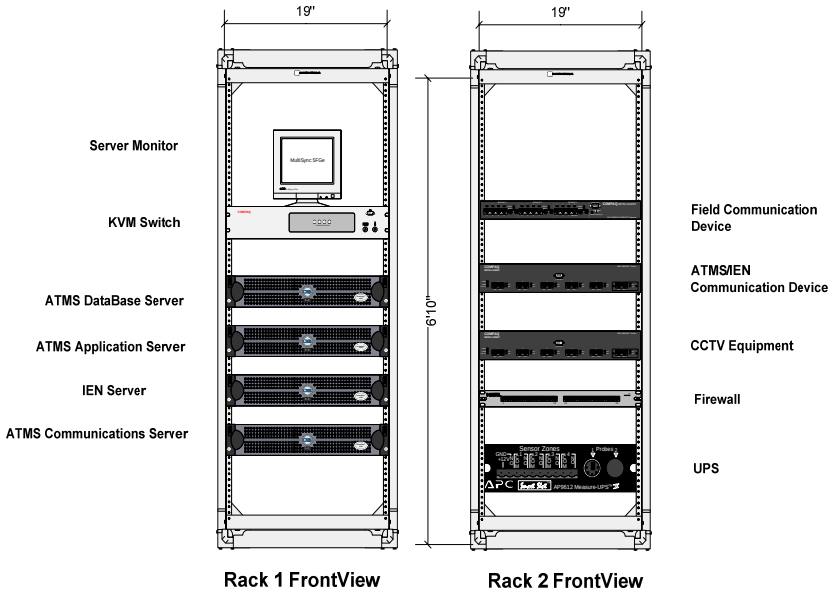
Conceptual Design Plan

Recommendations Local Control Centers (LCC) – Level 2B

- Cities that will host ATMS, IEN, and Video servers – Commerce, Compton, South Gate, and Vernon
- The following layout applies only to Vernon, other cities have existing LCCs





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Conceptual Design Plan Recommendations

Local Control Centers (LCC) – Level 3

- Agencies that serves as host to other Cities – County and Long Beach
- Both agencies have existing LCCs

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Initial Project Recommendations
Communications Systems

- Field-to-center communication
  - Use of agency-owned wireless and leased lines for new communications link
  - Continued use of existing fiber or TWP where available.
- Center-to-center communications
  - Use of T-1 lines to support ATMS, IEN, and Video distribution

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Conceptual Design Plan Recommendations

Breakdown of Capital Costs

Project Element	Capital Cost	Percentage of Total Project Capital Cost
ATMS	$360,000	7%
IEN	$725,000	14%
Video Distribution	$476,500	9%
Controller Upgrades	$459,000	9%
CCTV Cameras	$220,000	7%
Detection	$26,000	<1%
LCC	$173,350	4%
Field to Center – Wireless	$2,620,000	49%
Field to Center – TWP	$28,300	1%
Center to Center – T1 line	$50,900	1%
Total Project Capital Costs	**$5,333,400**	

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Conceptual Design Plan

Breakdown of Capital Costs By Agency

Agency	Capital Cost	Percentage of Total Project Capital Cost
Bell	$359,250	7%
Bell Gardens	$452,750	8%
Commerce	$240,300	5%
Compton	$446,600	8%
Cudahy	$97,450	2%
Huntington Park	$595,500	11%
Lynwood	$521,250	10%
Long Beach	$339,600	6%
Maywood	$291,500	5%
Paramount	$223,150	4%
Signal Hill	$25,550	<1%
South Gate	$149,500	3%
Vernon	$707,500	13%
Los Angeles County	$883,600	17%

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Implementation Plan
Balancing the Budget

- Cost of capital improvements much higher than available project budget ($2.3 million)
- Project re-scoped as follows to fit in the available budget:
  - Project implementation area restricted to North of Artesia and East of Alameda
  - Number of cameras reduced from 20 to 7.
  - Reduction in number of signals to be equipped with wireless communications – from 262 To 139.
  - No detector re-wiring.
  - Controllers upgrades on Florence removed (part of TSSP project).
  - No equipment for remotes sites .

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Implementation Plan
City of Bell Improvements

Field Elements	Number of Installations
ATMS	1 Client ATMS Workstation.
IEN	1 IEN Workstation
Video Distribution	N/A.
Controller Upgrades	3 Type 170 and 2 Type 170 E
CCTV Cameras	No CCTV cameras.
System Detection	Rewiring at 3 locations.
LCC	Provision of desk and rack for housing the ATMS and IEN equipment.
Field-to-Center Communication	Wireless Communications to 14 intersections.
Center-to-Center Communication	1 T-1 line connection for ATMS and IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $338,250
- City O&M cost - $9,127 to $42,927 per year

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Implementation Plan
City of Bell Gardens Improvements

Field Elements	Number of Installations
ATMS	1 Client ATMS Workstation
IEN	1 IEN Workstation
Video Distribution	1 field camera connected to County Video server
Controller Upgrades	4 NEMA.
CCTV Cameras	1 CCTV Camera.
System Detection	Rewiring at 6 locations.
LCC	Provision of a desk and a rack for housing the ATMS and IEN equipment.
Field-to-Center Communication	Wireless Communication to 23 intersections.
Center-to-Center Communication	1 T-1 line connection for ATMS and IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $431,750
- City O&M cost - $15,702 to $49,502 per year

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Implementation Plan
City of Commerce Improvements

Field Elements	Number of Installations
ATMS	ATMS Upgrades as part of I-5/Telegraph Road Corridor Project
IEN	IEN Interface as part of I-5/Telegraph Road Corridor Project
Video Distribution	Provision of a video server.
Controller Upgrades	14 Type 170 and 2 Type 170 E
CCTV Cameras	1 CCTV camera
System Detection	Rewiring at 2 locations.
LCC	Provided as part of I-5/Telegraph Road Corridor Project
Field-to-Center Communication	Twisted Wire Pair (TWP) upgrades at 17 intersections
Center-to-Center Communication	Provided as part of I-5/Telegraph Road Corridor Project

- County funded capital improvements - $105,300
- City O& M cost - $3,490 per year

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Implementation Plan
City of Compton Improvements

Field Elements	Number of Installations
ATMS	Provided through City Project
IEN	CDI Interface.
Video Distribution	Provision of a Video Server
Controller Upgrades	None – Provided through City Project
CCTV Cameras	1 CCTV Camera.
System Detection	Rewiring at 4 locations.
LCC	Provision of a desk and a rack for housing the IEN equipment..
Field-to-Center Communication	None – Provided through City Project
Center-to-Center Communication	1 T-1 line connection for IEN and Video distribution

- County funded capital improvements - $386,600
- City O&M cost - $8,232 per year

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Implementation Plan
City of Cudahy Improvements

Field Elements	Number of Installations
ATMS	Not requested.
IEN	1 IEN Workstation.
Video Distribution	N/A
Controller Upgrades	4 Type 170 and 1 Type 170E.
CCTV Cameras	No CCTV cameras.
System Detection	No system detection provided.
LCC	Provision of a desk and a rack for housing the IEN equipment..
Field-to-Center Communication	Wireless Communication at 6 intersections.
Center-to-Center Communication	1 T-1 line connection for IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $97,450
- City O&M cost - $4,707 per year

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Implementation Plan
City of Huntington Park Improvements

Field Elements	Number of Installations
ATMS	1 Client ATMS Workstation.
IEN	1 IEN Workstation.
Video Distribution	N/A
Controller Upgrades	7 Type 170 E and 14 NEMA.
CCTV Cameras	No CCTV cameras.
System Detection	Rewiring at 3 locations.
LCC	Provision of a desk and a rack for housing the ATMS & IEN equipment..
Field-to-Center Communication	Wireless Communication at 28 intersections. 4 intersections connected via fiber along Alameda corridor.
Center-to-Center Communication	1 T-1 line connection for ATMS and IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $412,850
- City O&M cost - $16,977 to $50,777 per year

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Implementation Plan
City of Lynwood Improvements

Field Elements	Number of Installations
ATMS	1 ATMS Workstation.
IEN	1 IEN Workstation.
Video Distribution	2 field cameras connected to County Video server
Controller Upgrades	10 Type 170 and 13 Type 170E.
CCTV Cameras	2 CCTV cameras.
System Detection	Rewiring at 1 locations.
LCC	Provision of a desk and a rack for housing the ATMS & IEN equipment..
Field-to-Center Communication	Wireless Communication at 18 intersections. 5 intersections connected via fiber along Alameda corridor.
Center-to-Center Communication	1 T-1 line connection for ATMS and IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $324,250
- City O&M cost - $15,877 to $49,677 per year

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Implementation Plan
City of Long Beach Improvements

Field Elements	Number of Installations
ATMS	Existing.
IEN	1 IEN Workstation.
Video Distribution	Provision of a Video Server
Controller Upgrades	No upgrades.
CCTV Cameras	1 CCTV camera.
System Detection	No rewiring.
LCC	Provision of a desk and a rack for housing the IEN equipment.
Field-to-Center Communication	Existing communication media used.
Center-to-Center Communication	1 T-1 line connection for ATMS, IEN and Video Distribution

- County funded capital improvements - $207,950
- City O&M cost - $8,232 per year

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Implementation Plan
City of Maywood Improvements

Field Elements	Number of Installations
ATMS	1 ATMS Workstation.
IEN	1 IEN Workstation.
Video Distribution	N/A
Controller Upgrades	17 Type 170.
CCTV Cameras	No CCTV cameras provided.
System Detection	No rewiring.
LCC	Provision of a desk and a rack for housing the ATMS & IEN equipment.
Field-to-Center Communication	Wireless Communication at 17 intersections.
Center-to-Center Communication	1 T-1 line connection to LA County TMC for ATMS and IEN Video distribution system access through existing Internet connection

- County funded capital improvements - $252,250
- City O&M cost - $11,477 to $45,277 per year

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Implementation Plan
City of Paramount Improvements

Field Elements	Number of Installations
ATMS	1 ATMS Workstation. To be hosted by City of Santa Fe Springs.
IEN	1 IEN Workstation. To be hosted by City of Santa Fe Springs.
Video Distribution	N/A
Controller Upgrades	2 Type 170 & 6 Type 170 E upgrades.
CCTV Cameras	No CCTV cameras provided.
System Detection	No rewiring.
LCC	Provision of a desk and a rack for housing the ATMS & IEN equipment.
Field-to-Center Communication	Wireless Communication to 11 intersections.
Center-to-Center Communication	Provided through I-105 Corridor Project

- County funded capital improvements - $145,000
- City O&M cost - $11,477 to $45,277 per year

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Implementation Plan
City of Signal Hill Improvements

Field Elements	Number of Installations
ATMS	Existing.
IEN	Not requested.
Video Distribution	N/A
Controller Upgrades	No upgrades.
CCTV Cameras	No CCTV cameras.
System Detection	No rewiring
LCC	Not required.
Field-to-Center Communication	Existing Communication media used.
Center-to-Center Communication	Video distribution system access through existing Internet connection

- County funded capital improvements - $23,450
- City O&M cost - $1,707 to $35,507 per year

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Implementation Plan
City of South Gate Improvements

Field Elements	Number of Installations
ATMS	ATMS Upgrades as part of I-105 Corridor Project
IEN	IEN Interface as part of I-105 Corridor Project
Video Distribution	N/A
Controller Upgrades	1 Type 170 E & 6 NEMA.
CCTV Cameras	No CCTV cameras.
System Detection	Rewiring at 3 locations
LCC	LCC equipment provided part of I-105 Corridor Project
Field-to-Center Communication	Wireless Communication to 6 intersections.
Center-to-Center Communication	Provided as part of I-105 Project

- County funded capital improvements - $85,000
- City O&M cost - $3,000 per year

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Implementation Plan
City of Vernon Improvements

Field Elements	Number of Installations
ATMS	Upgraded ATMS
IEN	CDI Interface
Video Distribution	Provision of a host Video Server
Controller Upgrades	1 Type 170, 1 Type 170 E and 5 NEMA.
CCTV Cameras	1 CCTV camera.
System Detection	No rewiring.
LCC	New LCC provided to house the ATMS, IEN and Video Distribution host servers, CCTV and communication equipment.
Field-to-Center Communication	Existing communication media used.
Center-to-Center Communication	1 T-1 line connection for ATMS, IEN and Video Distribution

- County funded capital improvements - $634,250
- City O&M cost - $40,027 to $73,827 per year

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Implementation Plan
Los Angeles County Improvements

Field Elements	Number of Installations
ATMS	Existing infrastructure.
IEN	Existing infrastructure.
Video Distribution	Existing infrastructure.
Controller Upgrades	19 Type 170 & 14 Type 170E.
CCTV Cameras	No CCTV cameras provided.
System Detection	Rewiring at 3 locations
LCC	Existing infrastructure.
Field-to-Center Communication	Wireless Communication to 16 intersections. 7 intersections connected via fiber along Alameda corridor.
Center-to-Center Communication	6 T-1 line connection for ATMS and IEN.

- County funded capital improvements - $262,400
- City O&M cost - $9,890 per year

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Implementation Plan

Breakdown of Capital Costs

Project Element	Capital Cost	Percentage of Total Project Capital Cost
ATMS	$330,000	10%
IEN	$490,000	15%
Video Distribution	$270,500	8%
Controller Upgrades	$307,000	9%
CCTV Cameras	$140,000	4%
Detection	$0	0%
LCC	$182,800	5%
Field-to-Center – Wireless	$1,390,000	42%
Field-to-Center – TWP	$28,300	1%
Field-to-Center – Fiber	$147,079	4%
Center-to-Center – T1 line	$44,500	1%
Total Cost	**$3,333,979**	

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Implementation Plan

Breakdown of Capital Costs By Agency

Agency	Capital Cost	Percentage of Total Project Capital Cost
Bell	$189,250	6%
Bell Gardens	$308,750	9%
Commerce	$144,800	4%
Compton	$207,950	6%
Cudahy	$97,450	3%
Huntington Park	$423,020	13%
Lynwood	$343,212	10%
Long Beach	$207,950	6%
Maywood	$247,250	7%
Paramount	$158,150	5%
Signal Hill	$0	0%
South Gate	$85,000	3%
Vernon	$634,250	19%
Los Angeles County	$286,947	9%

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Implementation Plan

Controller Upgrades and Communication Upgrade Summary

Agency	Controller	TWP Intersections	Fiber Intersections	Wireless Intersections
Bell	5			14
Bell Gardens	4			23
Commerce	16	17		
Compton				
Cudahy	5			6
Huntington Park	21		4	28
Lynwood	23		5	18
Long Beach				
Maywood	17			17
Paramount	8			11
Signal Hill				
South Gate	7			6
Vernon	7			
Los Angeles County	33		7	16

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Next Steps

- Finalize Implementation Plan.
- Prepare Scope of Work and Cost Estimate for Detailed Design.
- Start work on Detailed Design.
- Start Implementation where possible.