SIEMENS

Deliverable For:

Gateway Cities Traffic Signal Synchronization and Bus Speed Improvement Project

Atlantic Blvd. / I-710 Corridor

Deliverable 2.5.1.5

Draft CCTV Location Analysis

Version 1

Submitted To:

Los Angeles County
Department of Public Works

Submitted By:

Siemens ITS

February 21, 2005

SIEMENS

Revision History

Version	Date Submitted	Comments
Draft Version 1	February 21, 2005	Initial submittal

SIEMENS

TABLE OF CONTENTS

List of Tables and Figures

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 Atlantic Blvd./I-710 Corridor is one such project which will result in arterial infrastructure improvements on north-south and east-west arterials along I-710 freeway in the South-East LA County (Gateway Cities) Forum.

The objective of this project is to design, develop and deploy Advanced Traffic Control system(s) (ATMS) in the corridor so that the signals in the Project area can be synchronized across the jurisdictional boundaries. This project concentrates on the needs of the agencies in this corridor with respect to signal synchronization 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 Atlantic Blvd./ I-710 Corridor will have full access to a 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.

Earlier reports for the Atlantic Blvd. / I-710 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, LCC Recommendations Report and Alternative Analysis reports for ATMS, and communications systems.

This Closed Circuit Television (CCTV) Location Analysis report analyses all 102 major[1] intersections in the Project area and evaluates each intersection location for the need to deploy CCTV at that location. The locations are analyzed using a combination of factors such as traffic volumes, level of service, accident rates and proximity to freeways ramps. A ranking for camera placement for each location is derived based on these factors.

1.2 Methodology Used

The CCTV location analysis for the Atlantic Blvd. /I-710 Corridor Project was performed using the methodology which had been developed through a separate County Traffic Forum project. This methodology was applied as follows:

[1] For the purposes of this analysis an intersection is defined as a major intersection where two major project roadways meet or major project roadway meets with the freeway ramp. Major project roads are defined as having at least 4 through lanes in both directions.

1. Development of CCTV location prioritization criteria (See Table 1):
    a. Previous work identified four factors that affect the decision to place a camera at a given location. These are:
        i. Accident history: Average number of accidents per year over a 5 year period.
        ii. Level of service: Estimate of the quality of traffic flow of a approach based on traffic delays. LOS could range from A, representing free-flow conditions, to F, representing jammed conditions. It was calculated as follows:
            1) If both two approach at the intersection are project roads;
            Maximum East-West Directional Volume = Max {(InWB, InEB)}
            Maximum North-South Directional Volume = Max{(InSB, InNB)}
            if the intersection is freeway ramp intersection which has only one directional Volume (East-West or North-South), only the major street volume was used.
            2) Assume peak hour volume is approximately 1/10th of ADT, therefore the Directional Peak Hour Volume is: Max. Directional Volume*0.1
            3) Calculate Capacity as;
            Number of lanes*1600
            4) Calculate V/C Ratio by dividing Directional Peak Hour Volume by Capacity
            5) Calculate total V/C = Max (East-West V/C) + Max (North-South V/C) +0.1

            If the intersection is freeway ramp intersection, the

            V/C = East-West V/C or North-South V/C+0.1
            6) Assign LOS values as follows:

V/C Ratio	LOS
0 – 0.60	A
0.601 – 0.70	B
0.701 – 0.80	C
0.801 – 0.90	D
0.901 – 1.00	E
Over 1.001	F

        iii. Average daily traffic volume: this represents the average total number of vehicles including passenger cars, trucks and busses that pass through that intersection.
        iv. Proximity to freeway on–ramp: distance between the intersection and Freeway On-Ramp.
    b. An assignment of weight to these factors (factor weight) was made based on their relative importance to camera placement decision.

c. For each factor, ranges were developed based on their expected values. Each range was assigned a weight (range weight) to reflect its relative effect on camera placement decision.

Table 1: CCTV Prioritization Factors

Factors	Range	Range Weight	Factor Weight
1. Accident History (Average number of accidents per year over a 5 year period)	a. Greater than 5.6	4	5
	b. Between 4 and 5.6	3	
	c. Between 2.2 and 4	2	
	d. Less than or equal to 2.2	1	
2. Level of Service	a. F	4	4
	b. E	3	
	c. D	2	
	d. C,B or A	1	
3. Average Daily Traffic Volume	a. Over 60,000	4	3
	b. Between 45,000 and 60,000	3	
	c. Between 30,000 and 45,000	2	
	d. Less than 30,000	1	
4.Proximity to Freeway on -ramp	a. Adjacent	4	2
	b. Not Adjacent	0	

2. Data for each of the four factors was collected for all 102 potential CCTV locations. Appendix A presents a summary of data collection and extrapolation methodology.
3. Range weights were assigned to the factors based on their values according to the criteria.
4. For each location a weighted score was calculated by multiplying the range weight by the factor weight. The weighted scores for all factors were summed to derive a location score. (Appendix B presents the raw data; factor scores, weighted scores and location score for each location)
5. The location scores were analyzed to determine high priority, and low priority camera locations as follows:
    d. It was observed that:
        i. The highest score a location received is 56, the lowest score a location received is 12.
        ii. It was decided to assign 50% of the locations (52 locations) “high” priority and 50% of the locations (50 locations) “low” priority. It was observed that 50% of the locations had scores greater than 32. Thus the locations with scores 33 and

above were assigned “High” priority and locations with score 32 and lower were assigned “Low” priority.

Table 2 & Figure 1 presents the locations of High Priority ranking cameras by Jurisdiction. Appendix C contains the CCTV location sorted by ranking scores.

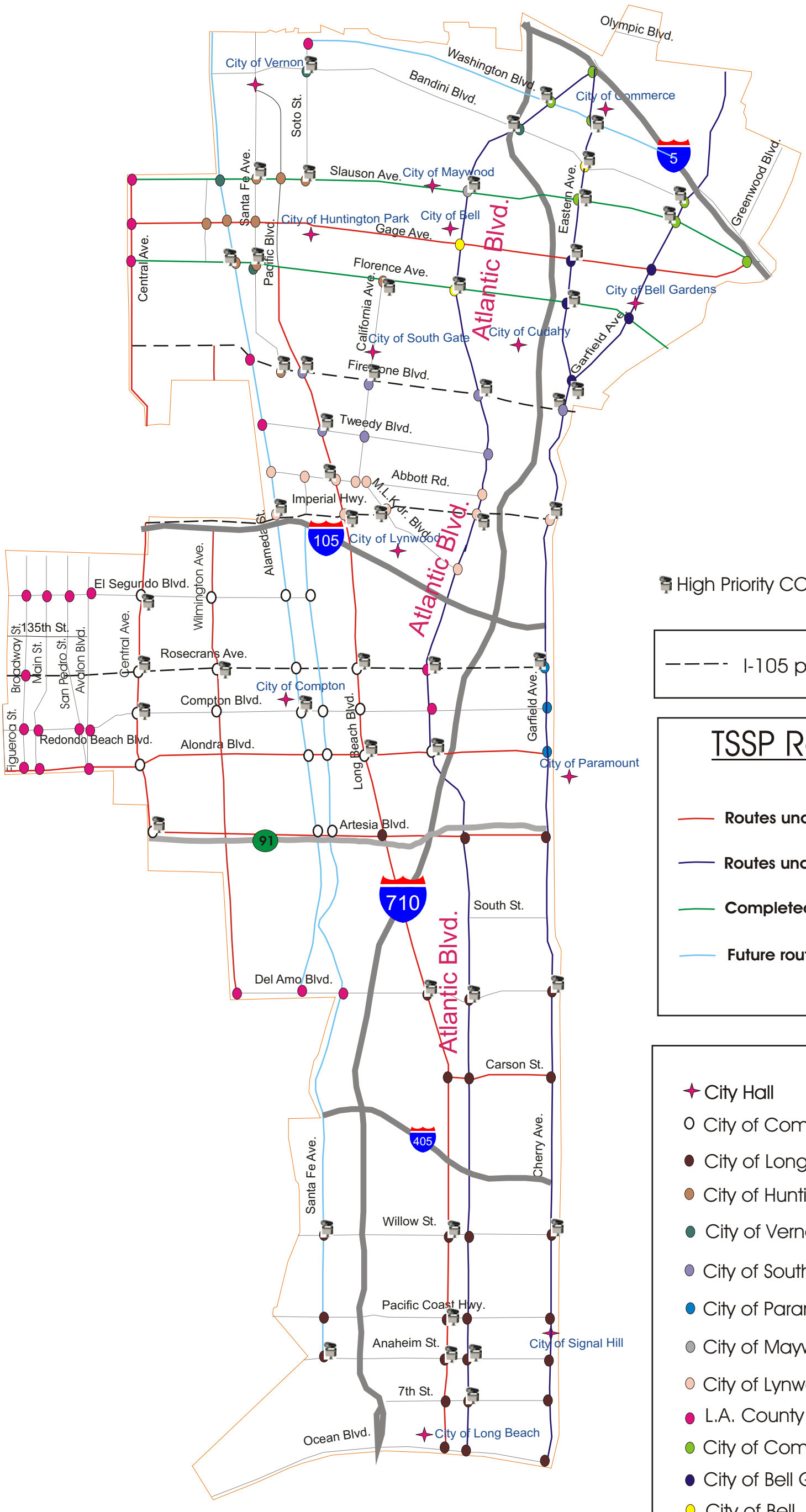
Table 2: Locations of High Priority Ranking Cameras

ID	Signal Intersection	Location Score	Jurisdiction
80	Alondra Blvd. /Atlantic Ave.	56	Compton
104	Artesia Blvd. /Central Ave	56	Compton
126	Atlantic Blvd. /Bandini Blvd.	56	Vernon
328	Eastern Ave. /Florence Ave.	56	Bell Gardens
420	Garfield Ave. /Firestone Blvd.	56	South Gate
447	Long Beach Blvd. /Imperial Hwy.	56	Lynwood
321	Eastern Ave. /Slauson Ave.	51	Commerce
38	Alameda St. /Imperial Hwy.	48	Lynwood
131	Atlantic Blvd. /Slauson Ave.	48	Maywood
146	Atlantic Ave. /Firestone Blvd.	48	South Gate
159	Atlantic Ave. /Rosecrans Ave.	48	County
670	Wilmington Ave. /Rosecrans Ave.	48	Compton
124	Atlantic Blvd. /Washington Blvd.	46	Commerce
150	Atlantic Ave. /Imperial Hwy.	45	Lywood
252	Central Ave. /El Segundo Blvd.	45	Compton
139	Atlantic Ave. / Florence Ave.	43	Bell
172	Atlantic Ave. /Del Amo Blvd.	43	Long Beach
312	Del Amo Blvd. /Long Beach Blvd.	43	Long Beach
440	Long Beach Blvd. /Firestone Blvd.	43	South Gate
504	M.L.K. Jr. Blvd. /Imperial Hwy.	43	Lynwood
49	Alameda St. /Compton Blvd.	41	Compton
220	Bandini Blvd. /Garfield Ave.	41	Commerce
233	California Ave. /Firestone Blvd.	41	South Gate
334	Eastern Ave. /Garfield Ave.	41	Bell Gardens
457	Long Beach Blvd. /Rosecrans Ave.	41	Compton
580	Santa Fe Ave. /Firestone Blvd.	41	South Gate
227	California Ave. /Florence Ave.	40	Huntington Park
355	Florence Ave. /Santa Fe Ave.	40	Huntington Park
590	Santa Fe Ave. /Willow St.	40	Long Beach
317	Eastern Ave. /Washington Blvd.	39	Commerce
411	Garfield Ave. /Slauson Ave.	38	Commerce
432	Garfield Ave. /Rosecrans Ave.	38	Paramount
96	Anaheim St. /Long Beach Blvd.	37	Long Beach
97	Anaheim St. /Atlantic Ave.	37	Long Beach
254	Central Ave. / Rosecrans Ave.	37	Compton
256	Central Ave. / Compton Blvd.	37	Compton
424	Garfield Ave. /Imperial Hwy.	37	South Gate
29	Alameda St. /Florence Ave.	36	Huntington Park
88	Anaheim St. /Santa Fe Ave.	36	Long Beach
218	Bandini Blvd. /Eastern Ave.	36	Bell
267	Cherry Ave. /Del Amo Blvd.	36	Long Beach
274	Cherry Ave. /Willow St.	36	Signal Hill
445	Long Beach Blvd. /M.L.K. Jr. Blvd.	36	Lynwood
574	Santa Fe Ave. /Slauson Ave.	36	Huntington Park
76	Alondra Blvd. /Long Beach Blvd.	35	Compton
324	Eastern Ave. /Gage Ave.	35	Bell Gardens
443	Long Beach Blvd. /Tweedy Blvd.	35	South Gate
10	7th St. /Atlantic Ave.	34	Long Beach

ID	Signal Intersection	Location Score	Jurisdiction
210	Bandini Blvd. /Soto St.	33	Vernon
484	Long Beach Blvd. /Willow St.	33	Long Beach
489	Long Beach Blvd. /Pacific Coast Hwy.	33	Long Beach
600	Slauson Ave. /Soto St.& Miles Ave.	33	Huntington Park

SIEMENS

Figure 1: Atlantic Blvd. /I-710 Corridor Project Area Showing High Priority CCTV Locations



Appendix A: Summary of Data Collection and Extrapolation

1. Accident History Data Collection and Data Reduction

Data Requirements: Annual Average Accident Data.

Data Sources:

1. California CHP
   Data provider: Roberta Tanger: 916-375-2850
   CHP provided Traffic Accident Records for all project intersections for last 5 years (01/01/1998 to 12/31/2002).

Data Extrapolation:

- The data received from CHP was converted into annual average accident data.

2. Level Of Service Data

Data Requirements: LOS data for each Intersection.

Data Extrapolation:

In order to keep the data consistent over all intersections, LOS calculations were made as follows:

1. If both two approach at the intersection are project roads;
   Maximum East-West Directional Volume = Max {(InWB, InEB)}
   Maximum North-South Directional Volume = Max{(InSB, InNB)}
   if the intersection is freeway ramp intersection which has only one directional Volume (East-West or North-South), only the major street volume was used.
2. Assume peak hour volume is approximately 1/10th of ADT, therefore the Directional Peak Hour Volume is: Max. Directional Volume*0.1
3. Calculate Capacity as;
   Number of lanes*1600
4. Calculate V/C Ratio by dividing Directional Peak Hour Volume by Capacity
5. Calculate total V/C = Max (East-West V/C) + Max (North-South V/C) +0.1

   If the intersection is freeway ramp intersection, the

   V/C = East-West V/C or North-South V/C+0.1
6. Assign LOS values as follows:

V/C Ratio	LOS
0 – 0.60	A
0.601 – 0.70	B
0.701 – 0.80	C
0.801 – 0.90	D
0.901 – 1.00	E
Over 1.001	F

LOS Calculation Example:

Intersection Name: Atlantic Ave. /Imperial Hwy.
ADT: InWB =14570 veh, InEB=14325,veh InSB=10985 veh, InNB=8539 veh
Lane Number: WB =2, EB =2, SB =2, NB =2

1) Max. East-West Directional Volume = Max{(InWB, InEB)}=14570, Direction is InWB
   Max. North-South Directional Volume = Max{(InSB, InNB)}=10985, Direction is InSB
2) Max. Directional Peak Hour Volume for E-W: 14570*0.1=1457
   Max. Directional Peak Hour Volume for N-S: 10985*0.1=1099
3) Capacity for E-W: 1600*2=3200
   Capacity for N-S: 1600*2=3200
4) V/C Ratio for E-W: 1457/3200 = 0.45
   V/C Ratio for N-S: 1099/3200= 0.34
5) Total V/C = 0.45+0.34+0.1=0.89
6) Because 0.89 is greater than 0.801 and less than 0.901, the LOS = D

3. Average Daily Traffic Data

Data Requirements: Approach (In EB, In NB, In WB, In SB) Daily Traffic Volumes.

Data Sources:

1. County of Los Angeles Department of Public Works
   Data provider: Fernando Villaluna: 626-300-2030
   County provided the Traffic Volumes retrived from L.A. County database. It covers traffic volume counts taken by the County of Los Angeles DPW during the years of 1997 through 2005.
   The traffic volume included most of the unincorporated areas of the County and some of the cities in the project areas.
   All are approach traffic counts.

2. City of Bell
   Data provider: Luis Ramirez: 323-588-6211. ext. 220
   Data provided for years 1998 and 2002.
   Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data.

3. City of Bell Gardens
   Data provider: Ishtiaque Ahmed from AAE: 714-940-0100
   Data provided for years 2004
   Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data.

4. City of Commerce
   Data provider: Victor San Lucas: 323-722-4805 ext 2206
   Data provided for years 2004
   Approach traffic counts provided for Atlantic Blvd. /Washington Blvd. vOther intersections data was supplemented by County Data.

5. City of Compton
   Data provider: Sarakki Associates: 949-851-3000
   Data provided for years 2001
   Section (Link) volume data provided for some links and being populated to approach volume. Other intersections data was supplemented by County Data.

6. City of Huntington Park
   Data provider: Patrick Fu: 323-584-6253
   Data provided for years 2001
   Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data.

7. City of Long Beach
   Data provider: Ed Norris: 562-570-5209
   Data provided for years 1998, 2000 and 2002
   Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data.

8. City of Lynwood
   Data provider: Helen Sanchez: 310-603-0220 ext 287
   Data provided for years 1997
   Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data

9. City of Maywood
   No data available for Project intersections.
   Data provided by County were used for analysis.

10. City of Paramount
    Data provider: Bill Pagett: 562-220-2108
    Data provided for years 2001
    Approach traffic counts provided for Alondra Blvd. / Garfield Ave. Other intersections data was supplemented by County Data

11. City of South Gate
    Data provider: Abdulla Ahmed: 323-563-9581
    Data provided for years 2002
    Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data

12. City of Vernon
    Data provider: Sherwood Natsuhara: 323-583-8811 ext 305
    Data provided for years 1998
    Approach traffic counts provided for intersections in the Project area. Other intersections data was supplemented by County Data

Data Extrapolation:

- In cases when only section volume data was available, all intersections within the section were populated with the available volume data. To estimate approach volumes, the link volumes were halved.

- If data was available for the same location from more than one source, the latest data was used.
- If data was available only for one approach of a pair, (e.g. EB in an EB/WB direction), the data for the opposite approach (WB) was assumed to be same.
- If data was unavailable for all the previous conditions, the same direction data from the nearest intersection was used.
- Raw data were normalized to the year 2004 by applying an annual growth factor of 1.4%.
- ADT equals to the sum of all approach data (InWB, InEB, InSB, InNB)

4. Proximity to Freeway On-Ramp

Data Requirements: Distance between the intersection and Freeway On-Ramp

Data Sources: Microsoft Street 98 software

Data Extrapolation: Those intersections along the major roadway where the distance to Freeway On-Ramp was less than 0.5 miles were categorized as "Adjacent". Others were categorized as: "Not Adjacent".

S

Appendix B: Raw Data, Factor Scores, Weighted Scores and Location Scores

ID	Signal Intersection	Accident History (Weight =5)			LOS (Weight =4)			AADT (Weight =3)			Proximity to Freeway on-ramp (Weight =2)			Location Score
		Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	
7	7th St. /Long Beach Blvd.	4.6	3	15	C	1	4	33,678	2	6	Not Adjacent	0	0	25
10	7th St. /Atlantic Ave.	12.0	4	20	D	2	8	41,104	2	6	Not Adjacent	0	0	34
19	Abbott Rd. /Atlantic Ave.	3.4	2	10	B	1	4	32,501	2	6	Adjacent	4	8	28
27	Alameda St. /Gage Ave.	2.4	2	10	C	1	4	41,309	2	6	Not Adjacent	0	0	20
29	Alameda St. /Florence Ave.	4.2	3	15	E	3	12	53,338	3	9	Not Adjacent	0	0	36
32	Alameda St. /Firestone Blvd.	2.0	1	5	F	4	16	56,610	3	9	Not Adjacent	0	0	30
38	Alameda St. /Imperial Hwy.	4.2	3	15	F	4	16	55,577	3	9	Adjacent	4	8	48
43	Alameda St. /El Segundo Blvd.	4.8	3	15	B	1	4	30,070	2	6	Not Adjacent	0	0	25
46	Alameda St. /Rosecrans Ave.	1.2	1	5	E	3	12	52,117	3	9	Not Adjacent	0	0	26
49	Alameda St. /Compton Blvd.	6.6	4	20	E	3	12	52,117	3	9	Not Adjacent	0	0	41
51	Alameda St. /Alondra Blvd.	5.4	3	15	B	1	4	35,845	2	6	Not Adjacent	0	0	25
58	Alameda St. /Del Amo Blvd.	1.4	1	5	A	1	4	24,607	1	3	Not Adjacent	0	0	12
60	Alondra Blvd. /S. Broadway	2.4	2	10	A	1	4	19,053	1	3	Adjacent	4	8	25
62	Alondra Blvd. /Avalon Blvd.	3.8	2	10	A	1	4	37,755	2	6	Not Adjacent	0	0	20
66	Alondra Blvd. /Central Ave.	1.8	1	5	E	3	12	54,953	3	9	Not Adjacent	0	0	26
67	Alondra Blvd. /Wilmington Ave.	5.0	3	15	D	2	8	47,069	3	9	Not Adjacent	0	0	32
76	Alondra Blvd. /Long Beach Blvd.	3.6	2	10	F	4	16	58,049	3	9	Not Adjacent	0	0	35
80	Alondra Blvd. /Atlantic Ave.	11.4	4	20	F	4	16	64,366	4	12	Adjacent	4	8	56
87	Alondra Blvd. /Garfield Ave.	2.0	1	5	D	2	8	52,824	3	9	Not Adjacent	0	0	22
88	Anaheim St. /Santa Fe Ave.	4.2	3	15	B	1	4	48,398	3	9	Adjacent	4	8	36
96	Anaheim St. /Long Beach Blvd.	10.4	4	20	D	2	8	45,433	3	9	Not Adjacent	0	0	37
97	Anaheim St. /Atlantic Ave.	9.4	4	20	D	2	8	50,934	3	9	Not Adjacent	0	0	37
104	Artesia Blvd. /Central Ave	14.0	4	20	F	4	16	82,037	4	12	Adjacent	4	8	56
120	Atlantic Blvd. /Eastern Ave.	2.6	2	10	B	1	4	36,722	2	6	Adjacent	4	8	28
124	Atlantic Blvd. /Washington Blvd.	3.4	2	10	F	4	16	94,249	4	12	Adjacent	4	8	46
126	Atlantic Blvd. /Bandini Blvd.	7.4	4	20	F	4	16	95,395	4	12	Adjacent	4	8	56
131	Atlantic Blvd. /Slauson Ave.	5.8	4	20	F	4	16	95,395	4	12	Not Adjacent	0	0	48
135	Atlantic Ave. /Gage Ave.	4.0	2	10	E	3	12	56,306	3	9	Not Adjacent	0	0	31
139	Atlantic Ave. / Florence Ave.	5.6	3	15	F	4	16	72,817	4	12	Not Adjacent	0	0	43
146	Atlantic Ave. /Firestone Blvd.	6.0	4	20	F	4	16	96,061	4	12	Not Adjacent	0	0	48
150	Atlantic Ave. /Imperial Hwy.	8.6	4	20	D	2	8	48,419	3	9	Adjacent	4	8	45
153	Atlantic Ave. /M.L.K. Jr. Blvd.	4.6	3	15	B	1	4	32,312	2	6	Not Adjacent	0	0	25
159	Atlantic Ave. /Rosecrans Ave.	5.0	3	15	F	4	16	58,088	3	9	Adjacent	4	8	48
161	Atlantic Ave. /Compton Blvd.	3.0	2	10	C	1	4	37,767	2	6	Not Adjacent	0	0	20
172	Atlantic Ave. /Del Amo Blvd.	4.8	3	15	F	4	16	64,795	4	12	Not Adjacent	0	0	43
204	Avalon Blvd. / El Segundo Blvd.	0.8	1	5	B	1	4	38,658	2	6	Not Adjacent	0	0	15
207	Avalon Blvd. / Rosecrans Ave.	3.6	2	10	D	2	8	43,300	2	6	Not Adjacent	0	0	24
208	Avalon Blvd. / Compton Blvd.	2.0	1	5	A	1	4	22,854	1	3	Not Adjacent	0	0	12
209	Avalon Blvd. / Redondo Beach Blvd.	2.0	1	5	A	1	4	27,306	1	3	Not Adjacent	0	0	12
210	Bandini Blvd. /Soto St.	1.8	1	5	F	4	16	63,249	4	12	Not Adjacent	0	0	33
218	Bandini Blvd. /Eastern Ave.	5.0	3	15	E	3	12	48,629	3	9	Not Adjacent	0	0	36

S

ID	Signal Intersection	Accident History (Weight =5)			LOS (Weight =4)			AADT (Weight =3)			Proximity to Freeway on-ramp (Weight =2)			Location Score
		Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	
220	Bandini Blvd. /Garfield Ave.	2.0	1	5	F	4	16	60,985	4	12	Adjacent	4	8	41
221	S. Broadway /El Segundo Blvd.	2.8	2	10	C	1	4	34,726	2	6	Adjacent	4	8	28
223	S. Broadway /Rosecrans Ave.	2.4	2	10	C	1	4	40,231	2	6	Adjacent	4	8	28
224	S. Broadway /Compton Blvd.	0.4	1	5	A	1	4	13,619	1	3	Adjacent	4	8	20
225	S. Broadway /Redondo Beach Blvd.	5.4	3	15	B	1	4	29,477	1	3	Adjacent	4	8	30
227	California Ave. /Florence Ave.	5.0	3	15	F	4	16	59,940	3	9	Not Adjacent	0	0	40
233	California Ave. /Firestone Blvd.	6.2	4	20	E	3	12	50,215	3	9	Not Adjacent	0	0	41
235	California Ave. /Tweedy Blvd.	7.6	4	20	A	1	4	30,916	2	6	Not Adjacent	0	0	30
236	California Ave. /M.L.K. Jr. Blvd.	7.6	4	20	C	1	4	37,695	2	6	Not Adjacent	0	0	30
252	Central Ave. /El Segundo Blvd.	7.2	4	20	F	4	16	51,546	3	9	Not Adjacent	0	0	45
254	Central Ave. / Rosecrans Ave.	6.0	4	20	D	2	8	48,348	3	9	Not Adjacent	0	0	37
256	Central Ave. / Compton Blvd.	6.0	4	20	D	2	8	50,049	3	9	Not Adjacent	0	0	37
267	Cherry Ave. /Del Amo Blvd.	5.8	4	20	C	1	4	62,828	4	12	Not Adjacent	0	0	36
274	Cherry Ave. /Willow St.	5.0	3	15	E	3	12	53,588	3	9	Not Adjacent	0	0	36
285	Compton Blvd. /Main St.	1.0	1	5	A	1	4	13,874	1	3	Adjacent	4	8	20
286	Compton Blvd. /San Pedro St.	1.4	1	5	A	1	4	13,151	1	3	Not Adjacent	0	0	12
290	Compton Blvd. /Wilmington Ave.	3.2	2	10	E	3	12	52,155	3	9	Not Adjacent	0	0	31
296	Compton Blvd. /Santa Fe Ave.	1.6	1	5	E	3	12	49,834	3	9	Not Adjacent	0	0	26
298	Compton Blvd. /Long Beach Blvd.	4.0	2	10	D	2	8	46,334	3	9	Not Adjacent	0	0	27
306	Somerset Blvd. /Garfield Ave.	2.8	2	10	E	3	12	52,824	3	9	Not Adjacent	0	0	31
307	Del Amo Blvd. /Wilmington Ave.	4.4	3	15	B	1	4	38,128	2	6	Not Adjacent	0	0	25
308	Del Amo Blvd. /Santa Fe Ave.	4.8	3	15	D	1	4	49,846	1	3	Adjacent	4	8	30
312	Del Amo Blvd. /Long Beach Blvd.	5.0	3	15	F	4	16	64,795	4	12	Not Adjacent	0	0	43
317	Eastern Ave. /Washington Blvd.	3.4	2	10	E	3	12	48,629	3	9	Adjacent	4	8	39
321	Eastern Ave. /Slauson Ave.	5.6	3	15	F	4	16	60,583	4	12	Adjacent	4	8	51
324	Eastern Ave. /Gage Ave.	3.0	2	10	D	2	8	48,447	3	9	Adjacent	4	8	35
328	Eastern Ave. /Florence Ave.	8.4	4	20	F	4	16	89,478	4	12	Adjacent	4	8	56
334	Eastern Ave. /Garfield Ave.	2.0	1	5	F	4	16	89,478	4	12	Adjacent	4	8	41
335	El Segundo Blvd. /Main St.	0.0	1	5	B	1	4	33,044	2	6	Not Adjacent	0	0	15
336	El Segundo Blvd. /San Pedro St.	2.6	2	10	A	1	4	29,478	1	3	Not Adjacent	0	0	17
342	El Segundo Blvd. /Wilmington Ave.	4.2	3	15	C	1	4	38,619	2	6	Not Adjacent	0	0	25
355	Florence Ave. /Santa Fe Ave.	4.4	3	15	F	4	16	54,539	3	9	Not Adjacent	0	0	40
374	Florence Ave. /Garfield Ave.	5.0	3	15	C	1	4	52,096	3	9	Not Adjacent	0	0	28
381	Gage Ave. /Wilmington Ave.	2.0	1	5	A	1	4	23,514	1	3	Not Adjacent	0	0	12
382	Gage Ave. /Santa Fe Ave.	0.0	1	5	F	4	16	46,508	3	9	Not Adjacent	0	0	30
385	Gage Ave. /Pacific Blvd.	5.4	3	15	C	1	4	38,758	2	6	Not Adjacent	0	0	25
406	Gage Ave. /Garfield Ave.	2.6	2	10	E	3	12	49,531	3	9	Not Adjacent	0	0	31
411	Garfield Ave. /Slauson Ave.	2.2	1	5	F	4	16	57,457	3	9	Adjacent	4	8	38
420	Garfield Ave. /Firestone Blvd.	9.8	4	20	F	4	16	104,614	4	12	Adjacent	4	8	56
424	Garfield Ave. /Imperial Hwy.	6.4	4	20	D	2	8	47,848	3	9	Not Adjacent	0	0	37
432	Garfield Ave. /Rosecrans Ave.	4.0	2	10	F	4	16	61,608	4	12	Not Adjacent	0	0	38
440	Long Beach Blvd. /Firestone Blvd.	4.8	3	15	F	4	16	63,897	4	12	Not Adjacent	0	0	43
443	Long Beach Blvd. /Tweedy Blvd.	2.8	2	10	F	4	16	51,147	3	9	Not Adjacent	0	0	35
445	Long Beach Blvd. /M.L.K. Jr. Blvd.	5.6	3	15	E	3	12	49,214	3	9	Not Adjacent	0	0	36
447	Long Beach Blvd. /Imperial Hwy.	17.6	4	20	F	4	16	74,506	4	12	Adjacent	4	8	56

S

ID	Signal Intersection	Accident History (Weight =5)			LOS (Weight =4)			AADT (Weight =3)			Proximity to Freeway on-ramp (Weight =2)			Location Score
		Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	Raw Data	Raw Score	Weighted Score	
457	Long Beach Blvd. /Rosecrans Ave.	6.4	4	20	E	3	12	53,144	3	9	Not Adjacent	0	0	41
484	Long Beach Blvd. /Willow St.	6.4	4	20	C	1	4	50,110	3	9	Not Adjacent	0	0	33
489	Long Beach Blvd. /Pacific Coast Hwy.	6.2	4	20	C	1	4	54,452	3	9	Not Adjacent	0	0	33
500	M.L.K. Jr. Blvd. /Santa Fe Ave.	0.8	1	5	A	1	4	17,994	1	3	Not Adjacent	0	0	12
504	M.L.K. Jr. Blvd. /Imperial Hwy.	4.4	3	15	F	4	16	67,248	4	12	Not Adjacent	0	0	43
510	Main St. / Rosecrans Ave.	3.0	2	10	C	1	4	37,366	2	6	Not Adjacent	0	0	20
511	Main St. / Redondo Beach Blvd.	1.2	1	5	A	1	4	26,291	1	3	Not Adjacent	0	0	12
533	Pacific Blvd. /Santa Fe Ave.	2.0	1	5	C	1	4	47,846	3	9	Not Adjacent	0	0	18
537	Pacific Blvd. /Slauson Ave.	3.0	2	10	E	3	12	49,256	3	9	Not Adjacent	0	0	31
560	Redondo Beach Blvd. /San Pedro St.	0.6	1	5	A	1	4	20,040	1	3	Not Adjacent	0	0	12
562	San Pedro St. / Rosecrans Ave.	2.0	1	5	B	1	4	33,974	2	6	Not Adjacent	0	0	15
574	Santa Fe Ave. /Slauson Ave.	4.2	3	15	E	3	12	51,400	3	9	Not Adjacent	0	0	36
580	Santa Fe Ave. /Firestone Blvd.	11.6	4	20	E	3	12	50,328	3	9	Not Adjacent	0	0	41
590	Santa Fe Ave. /Willow St.	5.0	3	15	D	2	8	46,237	3	9	Adjacent	4	8	40
600	Slauson Ave. /Soto St.& Miles Ave.	2.2	1	5	F	4	16	65,007	4	12	Not Adjacent	0	0	33
670	Wilmington Ave. /Rosecrans Ave.	6.0	4	20	F	4	16	64,684	4	12	Not Adjacent	0	0	48

S

Appendix C: CCTV Ranking By Scores

ID	Signal Intersection	Location Score	Priority Ranking
126	Atlantic Blvd. /Bandini Blvd.	56	High
420	Garfield Ave. /Firestone Blvd.	56	High
447	Long Beach Blvd. /Imperial Hwy.	56	High
80	Alondra Blvd. /Atlantic Ave.	56	High
104	Artesia Blvd. /Central Ave	56	High
328	Eastern Ave. /Florence Ave.	56	High
321	Eastern Ave. /Slauson Ave.	51	High
146	Atlantic Ave. /Firestone Blvd.	48	High
131	Atlantic Blvd. /Slauson Ave.	48	High
38	Alameda St. /Imperial Hwy.	48	High
159	Atlantic Ave. /Rosecrans Ave.	48	High
670	Wilmington Ave. /Rosecrans Ave.	48	High
124	Atlantic Blvd. /Washington Blvd.	46	High
150	Atlantic Ave. /Imperial Hwy.	45	High
252	Central Ave. /El Segundo Blvd.	45	High
440	Long Beach Blvd. /Firestone Blvd.	43	High
504	M.L.K. Jr. Blvd. /Imperial Hwy.	43	High
172	Atlantic Ave. /Del Amo Blvd.	43	High
312	Del Amo Blvd. /Long Beach Blvd.	43	High
139	Atlantic Ave. / Florence Ave.	43	High
233	California Ave. /Firestone Blvd.	41	High
580	Santa Fe Ave. /Firestone Blvd.	41	High
49	Alameda St. /Compton Blvd.	41	High
457	Long Beach Blvd. /Rosecrans Ave.	41	High
220	Bandini Blvd. /Garfield Ave.	41	High
334	Eastern Ave. /Garfield Ave.	41	High
590	Santa Fe Ave. /Willow St.	40	High
227	California Ave. /Florence Ave.	40	High
355	Florence Ave. /Santa Fe Ave.	40	High
317	Eastern Ave. /Washington Blvd.	39	High
432	Garfield Ave. /Rosecrans Ave.	38	High
411	Garfield Ave. /Slauson Ave.	38	High
424	Garfield Ave. /Imperial Hwy.	37	High
96	Anaheim St. /Long Beach Blvd.	37	High
97	Anaheim St. /Atlantic Ave.	37	High
254	Central Ave. / Rosecrans Ave.	37	High
256	Central Ave. / Compton Blvd.	37	High
274	Cherry Ave. /Willow St.	36	High
445	Long Beach Blvd. /M.L.K. Jr. Blvd.	36	High
88	Anaheim St. /Santa Fe Ave.	36	High
267	Cherry Ave. /Del Amo Blvd.	36	High
29	Alameda St. /Florence Ave.	36	High
574	Santa Fe Ave. /Slauson Ave.	36	High
218	Bandini Blvd. /Eastern Ave.	36	High
443	Long Beach Blvd. /Tweedy Blvd.	35	High
76	Alondra Blvd. /Long Beach Blvd.	35	High
324	Eastern Ave. /Gage Ave.	35	High
10	7th St. /Atlantic Ave.	34	High
210	Bandini Blvd. /Soto St.	33	High
484	Long Beach Blvd. /Willow St.	33	High
489	Long Beach Blvd. /Pacific Coast Hwy.	33	High
600	Slauson Ave. /Soto St.& Miles Ave.	33	High
67	Alondra Blvd. /Wilmington Ave.	32	Low

S

ID	Signal Intersection	Location Score	Priority Ranking
306	Somerset Blvd. /Garfield Ave.	31	Low
537	Pacific Blvd. /Slauson Ave.	31	Low
290	Compton Blvd. /Wilmington Ave.	31	Low
406	Gage Ave. /Garfield Ave.	31	Low
135	Atlantic Ave. /Gage Ave.	31	Low
235	California Ave. /Tweedy Blvd.	30	Low
236	California Ave. /M.L.K. Jr. Blvd.	30	Low
382	Gage Ave. /Santa Fe Ave.	30	Low
32	Alameda St. /Firestone Blvd.	30	Low
225	S. Broadway /Redondo Beach Blvd.	30	Low
308	Del Amo Blvd. /Santa Fe Ave.	30	Low
19	Abbott Rd. /Atlantic Ave.	28	Low
221	S. Broadway /El Segundo Blvd.	28	Low
223	S. Broadway /Rosecrans Ave.	28	Low
120	Atlantic Blvd. /Eastern Ave.	28	Low
374	Florence Ave. /Garfield Ave.	28	Low
298	Compton Blvd. /Long Beach Blvd.	27	Low
46	Alameda St. /Rosecrans Ave.	26	Low
66	Alondra Blvd. /Central Ave.	26	Low
296	Compton Blvd. /Santa Fe Ave.	26	Low
153	Atlantic Ave. /M.L.K. Jr. Blvd.	25	Low
7	7th St. /Long Beach Blvd.	25	Low
385	Gage Ave. /Pacific Blvd.	25	Low
60	Alondra Blvd. /S. Broadway	25	Low
307	Del Amo Blvd. /Wilmington Ave.	25	Low
43	Alameda St. /El Segundo Blvd.	25	Low
51	Alameda St. /Alondra Blvd.	25	Low
342	El Segundo Blvd. /Wilmington Ave.	25	Low
207	Avalon Blvd. / Rosecrans Ave.	24	Low
87	Alondra Blvd. /Garfield Ave.	22	Low
27	Alameda St. /Gage Ave.	20	Low
62	Alondra Blvd. /Avalon Blvd.	20	Low
161	Atlantic Ave. /Compton Blvd.	20	Low
224	S. Broadway /Compton Blvd.	20	Low
285	Compton Blvd. /Main St.	20	Low
510	Main St. / Rosecrans Ave.	20	Low
533	Pacific Blvd. /Santa Fe Ave.	18	Low
336	El Segundo Blvd. /San Pedro St.	17	Low
204	Avalon Blvd. / El Segundo Blvd.	15	Low
335	El Segundo Blvd. /Main St.	15	Low
562	San Pedro St. / Rosecrans Ave.	15	Low
500	M.L.K. Jr. Blvd. /Santa Fe Ave.	12	Low
381	Gage Ave. /Wilmington Ave.	12	Low
58	Alameda St. /Del Amo Blvd.	12	Low
208	Avalon Blvd. / Compton Blvd.	12	Low
209	Avalon Blvd. / Redondo Beach Blvd.	12	Low
286	Compton Blvd. /San Pedro St.	12	Low
511	Main St. / Redondo Beach Blvd.	12	Low
560	Redondo Beach Blvd. /San Pedro St.	12	Low