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LONG BEACH DOWNTOWN COMMUNITY PLAN EIR TRAFFIC IMPACT ANALYSIS

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1.0 EXECUTIVE SUMMARY

This report summarizes the results of a traffic impact analysis that was undertaken for the Long Beach Downtown Community Plan EIR (hereafter know as the Project). The report summarizes the methodology, findings and conclusions of that traffic analysis. A total of 53 intersections in and adjacent to Downtown Long Beach were analyzed. The analysis considered new vehicle trip making that will result from the Project, as well as traffic growth from other development (identified related projects) in the surrounding area. The study covers local and arterial roadways serving the project area. County of Los Angeles Congestion Management Program (CMP) guidelines were also used to assess the designated CMP roadway system.

1.1 STUDY AREA

The Downtown Community Plan area is located in the central business district of Long Beach. It encompasses the Downtown Core, and residential areas, totaling 631 acres, or approximately 1 square mile. The boundaries are roughly the 710 freeway to the west, Ocean Boulevard to the south, and Alamitos Avenue to the east. The northern boundary is varied, extending to 10th Street on the eastern portion, to 5th Street on the west, and 7th Street or 10th Street at the central portion.

1.2 EXISTING CONDITIONS

AM and PM peak-hour LOS analyses were conducted for the 53 study intersections based on the measured traffic volumes, geometries, and the previously described methodologies. The results, indicate that 4 of the 53 study intersections are currently operating at LOS E or F during either the AM or PM peak hour or both. The remaining 49 intersections currently operate at LOS D or better. The intersections that currently operate at level of service of E or worse are:

- Alamitos Avenue and Anaheim Street (#41)
- Alamitos Avenue and 7th Street (#43)
- Alamitos Avenue and Broadway (#47)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard (#48)

1.3 FUTURE YEAR TRAFFIC CONDITIONS AND ANALYSIS

The anticipated build out year of the Cumulative Projects and Downtown Community Plan is year 2035. Per guidance from the City of Long Beach staff, future year analysis is based on existing intersection geometry. The projection of year 2035 “Without Project” traffic consists of existing traffic plus growth in traffic generated by specific Cumulative Projects expected to be completed by 2035. The year 2035 “With Project” traffic consists of Without Project plus the Downtown Community Plan growth within the study area with the build out anticipated to be completed by year 2035. The City provided with a list of Cumulative Projects to include in the Without Project scenario. The Cumulative Projects are known as reasonably foreseeable developments that will occur before build out of Community Plan. The Cumulative Projects list includes residential, office, retail, restaurant and hotel land uses. Traffic resulting from these

projects is used to assess conditions prior to the implementation of the Downtown Community Plan.

1.3.1 Trip Generation

The trip generation analysis was completed in a two step process. The first step was to estimate the unadjusted trip generation rates for the Cumulative Projects and the Downtown Community Plan using the ITE trip rates. Morning and evening peak-hour trip estimates were developed based on rates published in the Institute of Transportation Engineer's (ITE) publication *Trip Generation, 8th Edition*. The second step was to then apply the trip reduction adjustments discussed above to the ITE trip rates to provide customized trip rates for the Downtown Long Beach area. Reasonable trip reductions have been developed to account for pass-by and non-auto trips based on various sources including information in the *ITE Trip Generation* publications, *Year 2000 US Census Journey to Work* and empirical studies of transit mode split in Downtown Long Beach. The total added vehicle trips associated with the Cumulative Projects as well as the Downtown Community Plan are 130,433 daily trips, 7,757 AM peak hour trips (accounting for all adjustments) and 9,034 PM peak hour trips (accounting for all adjustments).

1.3.2 Trip Distribution

The next step in the traffic study process is to apply the trips estimated in the trip generation analysis to the roadway network. There are two sets of trip distribution assumptions, representing the western and eastern portions of Downtown. The distribution differs for each of the two areas because of the proximity to the I-710 freeway, the proximity to various major arterials and other factors that influence route choice in east versus west Downtown Long Beach. In addition, a unique trip distribution pattern is applied in the model for various traffic analysis zones based on which arterial roadways serve a particular zone, the type of land uses, and proximity to the freeway. The trips generated by the Cumulative Projects and the Community Plan were assigned to the area street system based on this data and the resulting directional distribution.

At this point, due to the conceptual stage of the Downtown Community Plan, the precise locations of the land uses are not known. Therefore, Downtown study area was divided into a series of Traffic Analysis Zones (TAZ). Trip generation and trip distribution are determined for each project zone based on the forecast land use within each zone. These added trips were applied to the current traffic volumes on the study area roadway system, and the resultant system level of service conditions was then analyzed.

1.4 Cumulative Projects (Without Project Scenario)

To evaluate the potential impact of the proposed project on local traffic conditions, it is first necessary to develop a forecast of future traffic volumes in the study area under conditions without the Project (land uses associated with the Downtown Community Plan). This provides a basis against which to measure the Project's traffic impacts. Cumulative Projects are approved, pending and reasonably foreseeable projects in the Downtown area that will generate future daily as well as AM and PM trips impacting the study area. For this analysis, all Cumulative Projects in the Without Project scenario were assumed to be completed prior to build out of the Plan.

1.4.1 CUMULATIVE PROJECT TRIP GENERATION

Table E-1 summarizes total net future trip generation of the Cumulative Projects (Without Project) within the study area by traffic analysis zone. Note that the trips are net trips and they account for all of the adjustments described above. The trip generation forecasts for the Cumulative Projects are – 38,994 daily trips, 2,419 AM peak hour trips (accounting for all adjustments) and 2,716 PM peak hour trips (accounting for all adjustments)

TABLE E-1: SUMMARY TRIP GENERATION OF CUMULATIVE PROJECTS

Land Use Zones	Pending/Approved Projects					Total Trips						
						AM			PM			Daily
	Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)	Total Trips	Ins	Outs	Total Trips	Ins	Outs	Total Trips
Cumulative Projects (without Project Scenario)												
3	291	535.00	8.00	2.00		673	513	160	683	195	488	5,965
12	624		16.74	4.18		258	81	177	329	200	128	5,821
13	166		14.90	3.72		141	58	83	185	106	79	3,444
14	96		3.70	0.92	191	158	72	86	196	109	87	3,617
24	324		10.10	2.53		161	53	108	205	123	82	3,640
28	1,586	340.00	37.42	9.36	265	1,027	554	473	1,163	552	611	16,507
Subtotal	1,501	535.00	53.44	13.35	191	**2,419**	**1,331**	**1,087**	**2,761**	**1,285**	**1,476**	**38,994**

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.
Reduction for Pass-By, Transit Trips were applied only to the AM and PM peak hours only.
Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density.
No reductions are applied to the daily total trips.

1.4.2 YEAR 2035 WITHOUT-PROJECT TRAFFIC OPERATIONS

11 intersections are projected to be operating at LOS E or LOS F (4 are currently operating at LOS E or F). The 11 intersections are:

- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and Broadway – LOS E (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)

- Martin Luther King Avenue and 7th Street – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM Peak Hour) and LOS E (PM Peak hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

All other intersections are anticipated to be operating and LOS D or better during the AM and PM peak hours.

1.5 Downtown Community Plan (With Project Scenario)

The City provided a list of building areas within the influence area that are planned to be associated with the Downtown Community Plan. The list included apartments, condominiums, hotels, shopping centers and restaurants. For this analysis, the Downtown Community Plan was anticipated to be built out by year 2035.

1.5.1 Cumulative Project Trip Generation

Tables E-2 summarizes total net future trip generation of the Downtown Community Plan (With Project) within the study area by traffic analysis zone. Note that the trips are net trips and they account for all of the adjustments described above. The trip generation forecasts for the Downtown Community Plan are – 91,439 daily trips, 5,338 AM peak hours trips (accounting for all adjustments) and 6,273 PM peak hour trips (accounting for all adjustments)

The total added vehicle trips associated with the Cumulative Projects as well as the Downtown Community Plan are 130,433 daily trips, 7,757 AM peak hours trips (accounting for all adjustments) and 9,034 PM peak hour trips (accounting for all adjustments).

TABLE E-2: SUMMARY TRIP GENERATION OF DOWNTOWN COMMUNITY PLAN

Land Use Zones	Downtown Community Plan					Total Trips Generated by the Community Plan						
						AM			PM			Daily
	Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)	Total Trips	Ins	Outs	Total Trips	Ins	Outs	Total Trips
Downtown Community Plan (with Project Scenario)												
2	40					18	3	15	21	14	7	290
3		150.00	4.00	1.00		224	188	36	227	54	174	1,880
4	500	250.00	12.00	3.00	60	521	331	190	567	227	341	7,039
5	80					32	5	27	37	25	12	530
6	20					11	2	9	12	8	4	159
7	280		48.00	12.00		298	133	165	392	220	172	7,315
8	320					97	16	80	115	77	38	1,769
9	800	460.00	64.00	16.00		938	597	341	1,045	428	617	13,468
10	320	55.00				183	92	91	219	95	124	2,151
11	280	60.00				179	96	83	212	88	124	1,987
12	340	110.00				251	149	102	271	107	164	2,564
13	320	175.00	100.00	25.00		698	421	277	832	383	449	12,786
14	180	175.00				278	202	77	275	83	193	2,120
15	120					44	8	37	52	35	17	754
16	20					11	2	9	12	8	4	159
17	280		64.00	16.00	60	374	175	199	500	277	222	9,600
18	20		28.00	7.00	120	199	107	92	273	144	129	5,465
19	220		64.00	16.00	240	449	220	229	546	297	249	10,913
20	110	65.00				140	94	46	160	51	109	1,141
21	20					11	2	9	12	8	4	159
22	240				40	90	20	70	115	74	41	2,109
23	140				120	101	36	66	129	77	53	2,309
24	180				100	102	32	70	131	80	52	2,341
25	20				20	16	5	11	24	14	9	711
26	40					18	3	15	21	14	7	290
27	110				40	54	14	40	72	45	27	1,430
Subtotal	5,000	1,500.00	384.00	96.00	800	**5,338**	**2,952**	**2,386**	**6,273**	**2,932**	**3,341**	**91,439**
TOTAL						**7,757**	**4,284**	**3,474**	**9,034**	**4,217**	**4,817**	**130,433**

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.
Reduction for Pass-By, Transit Trips were applied only to the AM and PM peak hours only.
Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density.
No reductions are applied to the daily total trips.

1.5.2 Year 2035 With Project Traffic Operations

16 intersections are projected to be operating at LOS E or LOS F (11 intersections are anticipated to be operating at LOS E or F in the Without Project scenario). The 16 intersections are:

- Magnolia Avenue and 7th Street – LOS E (AM Peak Hour)
- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS F (AM Peak Hour)
- Pacific Avenue and Broadway – LOS E (PM Peak Hour)
- Pacific Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and 6th Street – LOS E (PM Peak Hour)
- Pine Avenue and Broadway – LOS F (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)
- Long Beach Boulevard and Ocean Boulevard – LOS E (AM Peak Hour)
- Martin Luther King Avenue and 7th Street – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM and PM Peak Hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (AM Peak Hour) and LOS F (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

All other intersections are anticipated to be operating and LOS D or better during the AM and PM peak hours.

1.6 Threshold of Significance

Based on the City of Long Beach Traffic Impact Guidelines, an impact is considered significant when the resulting level-of service with the project traffic is E or F and project related traffic (impact associated with the Community Plan) contributes a V/C of 0.020 or more to the critical movements. Of the 16 intersections impacted with the "With Project" traffic conditions, 15 intersections are considered significant impacts per the Threshold of Significance criteria.

1.7 Transportation System Improvement Recommendations

With the completion of Cumulative Projects and the Downtown Community Plan in the Downtown and Central area of the City, the capacity of the street system will become more intensely utilized. In 2009, only 4 of the 53 intersections are operating at LOS E or worse. In 2035, 16 intersections are expected to be operating at LOS E or worse. As the system's capacity is utilized, it will become important to manage the street system in a more efficient and coordinated manner. Improvements to the study area transportation system are proposed as part of the overall Downtown development including part of other area projects previously approved by the City of Long Beach.

1.8 Recommended Transportation Mitigation Measures

As discussed in this report, 15 intersections are forecasted to experience significant impacts as a result of the implementation of the Downtown Strategic Plan. However, due to right of way constraints and the inability to add physical capacity via widening, removal of parking or other measures, the ability to add physical roadway capacity is very limited. Thus, the mitigation must focus on achievable projects that will not require significant additional right-of-way and that are achievable within the life of the plan. There are five proposed mitigation measures for the Downtown Community Plan, as follows:

1. Implement Traffic Control System Improvements in Downtown on selected arterials
2. Improve Alamitos Avenue corridor via removal of selected parking spaces and the implementation of additional travel lanes plus bike lanes in each direction.
3. Reconfigure/reconstruct the Martin Luther King Avenue/Alamitos Avenue/6th Street/7th Street location for safety and traffic flow enhancements.
4. Enhance Freeway Access to I-710 to and from Downtown Long Beach.
5. Transit Facilities / Programs to Encourage Public Transit Usage and TDM Policies

With the implementation of the improvements mentioned above, **Table E-3** illustrates that seven of the 15 intersections significantly impacted by the Community Plan, operate at LOS D or better. The 15 intersections are:

- Magnolia Avenue and 7th Street – LOS E (AM Peak Hour)
- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS F (AM Peak Hour)
- Pacific Avenue and Broadway – LOS E (PM Peak Hour)
- Pacific Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and 6th Street – LOS E (PM Peak Hour)
- Pine Avenue and Broadway – LOS F (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)
- Long Beach Boulevard and Ocean Boulevard – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM and PM Peak Hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (AM Peak Hour) and LOS F (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

TABLE E-3: YEAR 2035-WITH-PROJECT INTERSECTION OPERATING CONDITIONS WITH MITIGATION

	Intersection	Existing				Future Without Project				Future With Project				Community Plan Impact (Future With Community Plan - Future Without Projects)		Significant Impact Before Mitigation	Future With Project with Mitigation				Significant Impact Before Mitigation	Mitigation Type
		AM		PM		AM		PM		AM		PM		AM	PM		AM		PM			
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	V/C	V/C		LOS	V/C	LOS	V/C		
1	Ocean Blvd / Golden Shore Ave	A	0.47	B	0.63	A	0.56	B	0.69	B	0.63	C	0.79	0.07	0.10		B	0.63	C	0.79		
2	Magnolia Ave / Anaheim St	C	0.72	C	0.71	C	0.73	C	0.72	C	0.74	C	0.72	0.00	0.00		C	0.74	C	0.72		
3	Magnolia Ave / 10th St	A	0.42	A	0.46	A	0.44	A	0.49	A	0.45	A	0.50	0.01	0.01		A	0.45	A	0.50		
4	Magnolia Ave / 7th St	B	0.67	A	0.48	D	0.89	C	0.74	E	0.92	C	0.76	0.03	0.02	YES	D	0.83	B	0.69		ATCS Implementation
5	Magnolia Ave / 6th St	A	0.57	B	0.64	C	0.77	E	0.93	D	0.82	E	0.97	0.05	0.04	YES	C	0.74	D	0.87		ATCS Implementation
6	Magnolia Ave / 3rd St	A	0.58	A	0.43	C	0.74	B	0.63	D	0.84	B	0.70	0.10	0.06		D	0.84	B	0.70		
7	Magnolia Ave / Broadway	B	0.61	A	0.54	C	0.74	B	0.70	C	0.78	C	0.79	0.04	0.09		B	0.70	C	0.71		ATCS Implementation
8	Magnolia Ave / Ocean Blvd	D	0.82	C	0.71	E	0.92	C	0.79	F	1.02	D	0.84	0.09	0.06	YES	E	0.91	C	0.76	YES	ATCS Implementation
9	Pacific Ave / Anaheim St	A	0.58	B	0.69	B	0.61	C	0.72	B	0.62	C	0.73	0.01	0.01		A	0.56	B	0.66		ATCS Implementation
10	Pacific Ave. / 10th Street	A	0.49	A	0.51	A	0.53	A	0.57	A	0.55	A	0.59	0.02	0.01		A	0.49	A	0.53		ATCS Implementation
11	Pacific Ave / 7th St	B	0.66	A	0.50	D	0.80	B	0.68	D	0.87	C	0.73	0.07	0.05		C	0.79	B	0.65		ATCS Implementation
12	Pacific Ave / 6th St	A	0.40	B	0.67	A	0.52	D	0.84	A	0.55	D	0.87	0.03	0.04		A	0.50	C	0.78		ATCS Implementation
13	Pacific Ave / 3rd St	A	0.52	A	0.42	B	0.64	A	0.55	B	0.69	A	0.59	0.05	0.04		B	0.62	A	0.53		ATCS Implementation
14	Pacific Ave / Broadway	A	0.39	B	0.69	A	0.54	D	0.86	A	0.57	E	0.92	0.03	0.07	YES	A	0.51	D	0.83		ATCS Implementation
15	Pacific Ave / Ocean Blvd	C	0.75	B	0.62	D	0.82	B	0.66	E	0.92	C	0.75	0.10	0.09	YES	D	0.83	B	0.68		ATCS Implementation
16	Pine Ave / Anaheim St	A	0.56	B	0.66	A	0.56	B	0.66	A	0.56	B	0.66	0.00	0.00		A	0.50	A	0.60		ATCS Implementation
17	Pine Ave. / 10th Street	A	0.46	A	0.43	A	0.48	A	0.46	A	0.48	A	0.47	0.01	0.01		A	0.44	A	0.42		ATCS Implementation
18	Pine Ave / 7th St	A	0.57	A	0.39	C	0.71	A	0.53	C	0.73	A	0.55	0.02	0.02		B	0.66	A	0.49		ATCS Implementation
19	Pine Ave / 6th St	A	0.44	B	0.69	A	0.56	D	0.88	A	0.59	E	0.91	0.02	0.03	YES	A	0.53	D	0.82		ATCS Implementation
20	Pine Ave / 3rd St	A	0.58	A	0.31	C	0.74	A	0.44	D	0.82	A	0.49	0.08	0.05		C	0.73	A	0.44		ATCS Implementation
21	Pine Ave / Broadway	A	0.42	B	0.67	B	0.67	E	0.97	C	0.74	F	1.09	0.07	0.12	YES	B	0.66	E	0.98	YES	ATCS Implementation
22	Pine Ave / Ocean Blvd	A	0.54	B	0.67	B	0.64	B	0.67	C	0.73	C	0.75	0.09	0.09		B	0.66	B	0.68		ATCS Implementation
23	Shoreline Dr / Pine Ave	A	0.33	A	0.49	A	0.33	A	0.50	A	0.37	A	0.54	0.04	0.05		A	0.37	A	0.54		
24	Long Beach Blvd / Anaheim St	A	0.55	B	0.70	B	0.62	C	0.78	B	0.64	D	0.82	0.03	0.04		B	0.64	D	0.82		
25	Long Beach Blvd / 10th St	A	0.59	B	0.66	B	0.67	C	0.76	C	0.70	C	0.80	0.03	0.04		B	0.70	C	0.80		
26	Long Beach Blvd / 7th St	C	0.71	A	0.56	E	0.92	C	0.76	E	0.96	D	0.80	0.04	0.04	YES	C	0.86	C	0.72		ATCS Implementation
27	Long Beach Blvd / 6th St	A	0.45	B	0.64	B	0.60	D	0.85	B	0.64	D	0.89	0.03	0.04		A	0.57	C	0.80		ATCS Implementation
28	Long Beach Blvd / 3rd St	A	0.53	A	0.42	C	0.77	B	0.67	D	0.83	C	0.72	0.06	0.04		D	0.83	C	0.72		
29	Long Beach Blvd / Broadway	A	0.32	B	0.61	A	0.41	C	0.76	A	0.44	D	0.82	0.03	0.06		A	0.40	C	0.73		ATCS Implementation
30	Long Beach Blvd / Ocean Blvd	C	0.70	B	0.67	D	0.82	C	0.74	E	0.92	D	0.85	0.09	0.11	YES	D	0.82	C	0.76		ATCS Implementation
31	Atlantic Ave / Anaheim St	B	0.65	D	0.81	C	0.71	D	0.87	C	0.73	D	0.90	0.03	0.03		C	0.73	D	0.90		
32	Atlantic Ave / 10th St	B	0.67	B	0.69	C	0.76	C	0.79	C	0.78	D	0.82	0.03	0.03		C	0.78	D	0.82		
33	Atlantic Ave / 7th St	C	0.73	A	0.48	D	0.86	B	0.61	D	0.90	B	0.64	0.04	0.04		D	0.81	B	0.58		ATCS Implementation
34	Atlantic Ave / 6th St	A	0.47	A	0.58	A	0.55	B	0.68	A	0.58	C	0.72	0.03	0.04		A	0.52	B	0.65		ATCS Implementation
35	Atlantic Ave / 3rd St	A	0.45	A	0.37	A	0.57	A	0.50	B	0.62	A	0.55	0.05	0.05		B	0.62	A	0.55		
36	Atlantic Ave / Broadway	A	0.24	A	0.58	A	0.31	B	0.70	A	0.34	C	0.74	0.03	0.05		A	0.31	B	0.67		ATCS Implementation
37	Atlantic Ave / Ocean Blvd	B	0.61	A	0.58	B	0.68	B	0.65	C	0.76	C	0.72	0.08	0.08		B	0.69	B	0.65		ATCS Implementation
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74	C	0.77	C	0.74	C	0.77	C	0.74	0.00	0.00		C	0.77	C	0.74		
39	Martin Luther King Ave / 10th	A	0.52	B	0.66	A	0.54	B	0.69	A	0.54	B	0.69	0.00	0.00		A	0.54	B	0.69		
40	Martin Luther King Ave / 7th S	D	0.83	B	0.69	E	0.93	C	0.79	E	0.94	D	0.80	0.01	0.01		E	0.94	C	0.80		
41	Alamiitos Ave / Anaheim St	B	0.63	E	0.93	C	0.71	F	1.01	C	0.75	F	1.05	0.04	0.04	YES	B	0.67	E	0.95	YES	ATCS Implementation
42	Alamitos Ave / 10th St	B	0.68	B	0.65	C	0.79	C	0.73	D	0.83	C	0.78	0.04	0.04		C	0.74	B	0.70		ATCS Implementation
43	Alamitos Ave / 7th St	E	0.92	C	0.75	F	1.05	E	0.92	F	1.09	F	1.04	0.04	0.12	YES	E	0.98	E	0.94	YES	ATCS Implementation
44	Alamitos Ave / 6th St	A	0.36	A	0.40	A	0.45	A	0.53	A	0.51	A	0.60	0.06	0.07		A	0.46	A	0.54		ATCS Implementation
45	Alamitos Ave / 4th St	A	0.55	D	0.88	C	0.73	F	1.04	D	0.81	F	1.14	0.08	0.10	YES	C	0.73	F	1.02	YES	ATCS Implementation
46	Alamitos Ave / 3rd St (*)	C	0.74	D	0.88	D	0.88	F	1.26	D	0.88	F	1.31	0.00	0.05	YES	C	0.74	F	1.18	YES	Geometric Improvement/ATCS
47	Alamitos Ave / Broadway	C	0.78	E	0.91	D	0.84	E	0.98	E	0.91	F	1.04	0.07	0.05	YES	D	0.64	E	0.94	YES	Geometric Improvement/ATCS
48	Alamitos/Shoreline Ave / Ocean	F	1.06	F	1.02	F	1.18	F	1.18	F	1.32	F	1.31	0.14	0.13	YES	F	1.19	F	1.18	YES	ATCS Implementation
49	Orange Ave / 10th St	C	0.78	C	0.75	C	0.79	C	0.75	C	0.79	C	0.75	0.00	0.00		C	0.79	C	0.75		
50	Orange Ave / 7th St	C	0.75	C	0.71	D	0.82	C	0.80	D	0.85	D	0.83	0.03	0.03		D	0.85	D	0.83		
51	Orange Ave / 3rd St	A	0.51	A	0.38	A	0.57	A	0.40	A	0.58	A	0.40	0.02	0.00		A	0.58	A	0.40		
52	Orange Ave / Broadway	A	0.47	B	0.66	A	0.47	C	0.70	A	0.48	C	0.73	0.01	0.02		A	0.48	C	0.73		
53	Orange Ave / Ocean Blvd	B	0.70	C	0.72	C	0.80	D	0.84	D	0.85	D	0.89	0.05	0.06		D	0.85	D	0.89		

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
(*) LOS reported is based on analysis using SYNCHRO 6 software because of the unique signal phase at this intersection.
The V/C (with mitigation conditions) with ATCS Implementation is based on 10% improvement in V/C over the "Future With Project" conditions
The V/C (with mitigation conditions) for intersections #46 and #47 is based on 10% improvement in V/C over the "Future With Project" with the ATCS implementation plus the geometric improvement (addition of southbound through) conditions

2.0 INTRODUCTION AND ENVIRONMENTAL SETTING

This report summarizes the results of a traffic impact analysis that was undertaken for the Long Beach Downtown Community Plan EIR (hereafter know as the Project). The report summarizes the methodology, findings and conclusions of that traffic analysis. A total of 53 intersections in and adjacent to Downtown Long Beach were analyzed. The analysis considered new vehicle trip making that will result from the Project, as well as traffic growth from other development (background growth and identified related projects) in the surrounding area. The study covers local and arterial roadways serving the project area. County of Los Angeles Congestion Management Program (CMP) guidelines were also used to assess the designated CMP roadway system.

2.1 STUDY AREA

The Downtown Plan area is located in the central business district of the City of Long Beach. It encompasses the Downtown Core, and residential areas, totaling 631 acres, or approximately 1 square mile. The boundaries are roughly the 710 freeway to the west, Ocean Boulevard to the south, and Alamitos Avenue to the east. The northern boundary is varied, extending to 10th Street on the eastern portion, to 5th Street on the west, and 7th Street or 10th Street at the central portion. Downtown Long Beach is situated in the southwest portion of the City of Long Beach. It is directly east and northeast of the Port of Long Beach, just across the 710 Freeway, the Los Angeles River, and the Queensway Bay. Downtown is about three miles south of the 405 freeway and is the terminus of the Blue Line, which runs from Downtown Long Beach to Downtown Los Angeles.

Figure 1 depicts the study area in the regional context and **Figure 2** illustrates the locations of the study intersections and the traffic study zones. Based on consultation with the City of Long Beach, 53 key intersections were selected for analysis. These are intersections deemed most likely to experience significant impacts from the Project and therefore warrant detailed analysis. All 53 study intersections are currently signalized. The study intersections are:

1. Golden Shore Street and Ocean Boulevard
2. Magnolia Avenue and Anaheim Street
3. Magnolia Avenue and 10th Street
4. Magnolia Avenue and 7th Street
5. Magnolia Avenue and 6th Street
6. Magnolia Avenue and 3rd Street
7. Magnolia Avenue and Broadway
8. Magnolia Avenue and Ocean Boulevard
9. Pacific Avenue and Anaheim Street
10. Pacific Avenue and 10th Street
11. Pacific Avenue and 7th Street
12. Pacific Avenue and 6th Street
13. Pacific Avenue and 3rd Street
14. Pacific Avenue and Broadway
15. Pacific Avenue and Ocean Boulevard
16. Pine Avenue and Anaheim Street
17. Pine Avenue and 10th Street
18. Pine Avenue and 7th Street
19. Pine Avenue and 6th Street
20. Pine Avenue and 3rd Street
21. Pine Avenue and Broadway
22. Pine Avenue and Ocean Boulevard

23. Pine Avenue and Shoreline Drive
24. Long Beach Boulevard and Anaheim Street
25. Long Beach Boulevard and 10th Street
26. Long Beach Boulevard and 7th Street
27. Long Beach Boulevard and 6th Street
28. Long Beach Boulevard and 3rd Street
29. Long Beach Boulevard and Broadway
30. Long Beach Boulevard and Ocean Boulevard
31. Atlantic Avenue and Anaheim Street
32. Atlantic Avenue and 10th Street
33. Atlantic Avenue and 7th Street
34. Atlantic Avenue and 6th Street
35. Atlantic Avenue and 3rd Street
36. Atlantic Avenue and Broadway
37. Atlantic Avenue and Ocean Boulevard
38. Martin Luther King Avenue and Anaheim Avenue
39. Martin Luther King Avenue and 10th Street
40. Martin Luther King Avenue and 7th Street
41. Alamitos Avenue and Anaheim Street
42. Alamitos Avenue and 10th Street
43. Alamitos Avenue and 7th Street
44. Alamitos Avenue and 6th Street
45. Alamitos Avenue and 4th Street
46. Alamitos Avenue and 3rd Street
47. Alamitos Avenue and Broadway
48. Alamitos Avenue and Ocean Boulevard
49. Orange Avenue and 10th Street
50. Orange Avenue and 7th Street
51. Orange Avenue and 3rd Street
52. Orange Avenue and Broadway
53. Orange Avenue and Ocean Boulevard

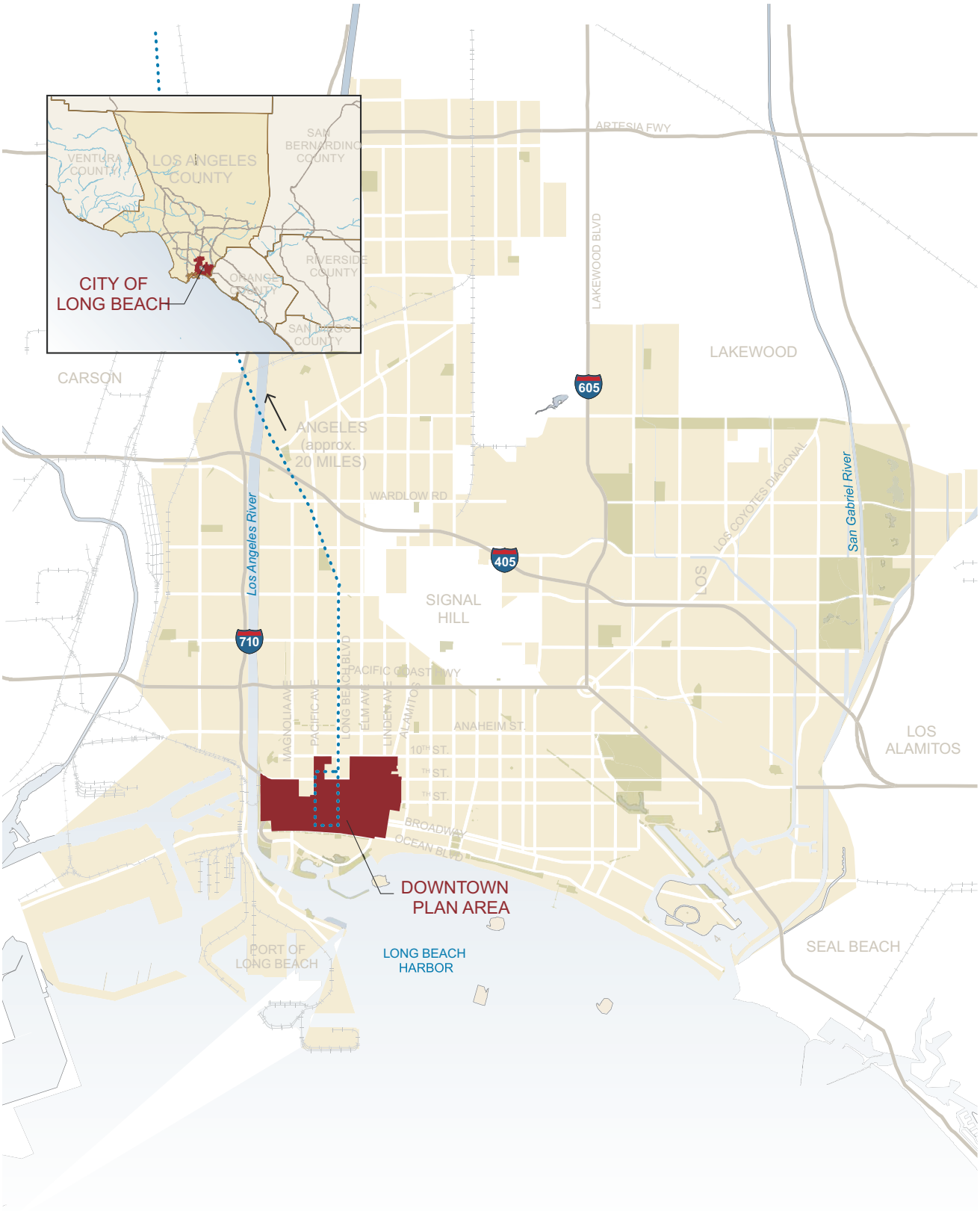

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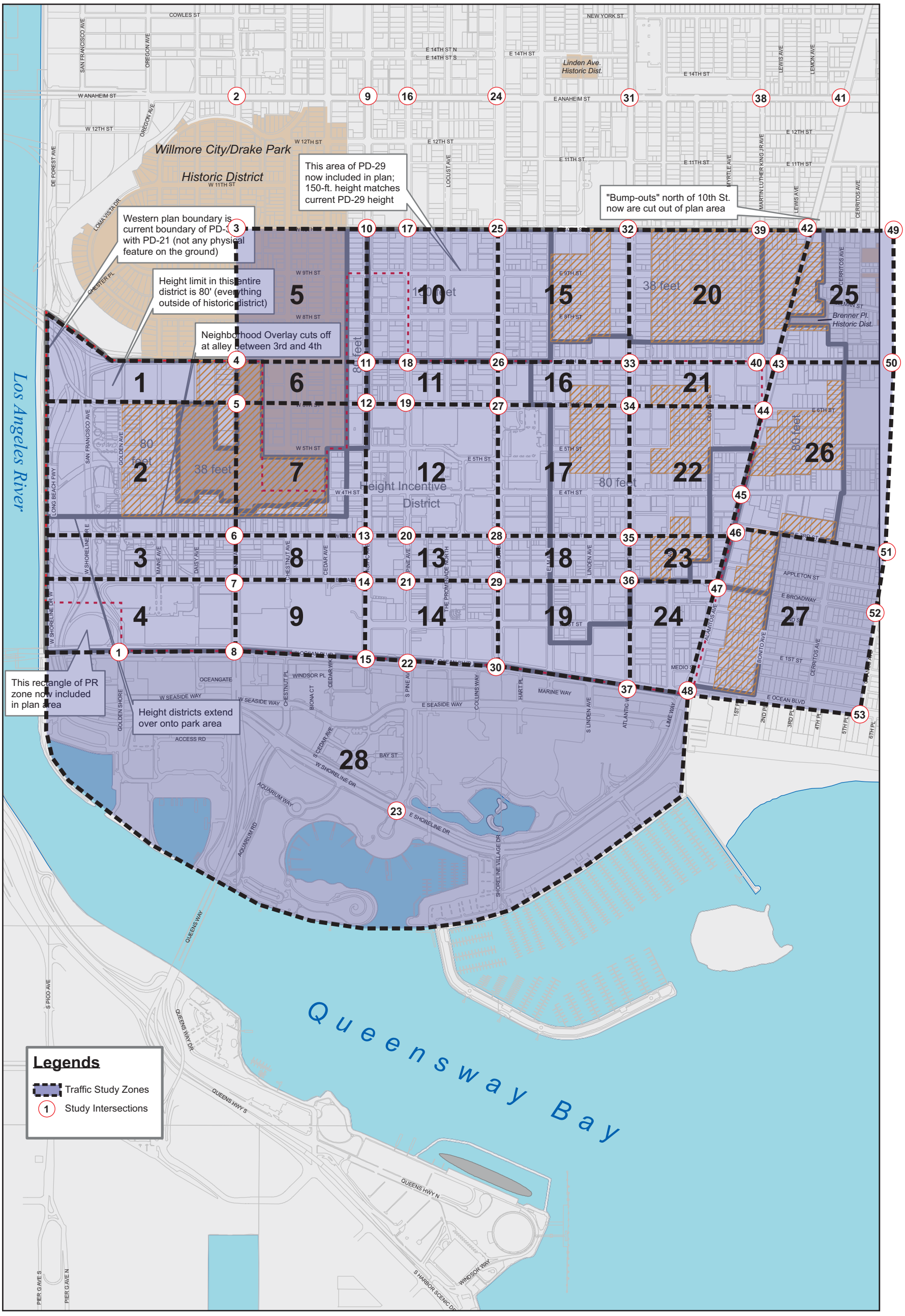
FIGURE 1
Project Location
Long Beach Downtown Community Plan



Source: EDAW

FIGURE 2
Study Intersections & Traffic Study Zones
Long Beach Downtown Community Plan

2.2 KEY ROADWAY DESCRIPTIONS

The following describes key roadways within and adjacent to the study area:

Shoreline Drive is a Regional Corridor in the City of Long Beach Transportation Element of the General Plan is a major east-west access route for Downtown Long Beach and provides direct access to and from I-710. It has three lanes in each direction with a raised median and the posted speed limit is 45 miles per hour (mph). On-street parking is allowed along Shoreline Drive between Chestnut and Pine Avenues. Shoreline Drive is parallel to Ocean Boulevard and provides direct access to the convention center, Shoreline Village, Long Beach Arena and the Waterfront shopping and restaurant areas.

Ocean Boulevard provides east-west linkage through Downtown and provides indirect access to the I-710 and eastern Long Beach. It is classified as a Major Arterial west of Alamitos Avenue and provides three lanes in each direction with a raised center median. To the east of Alamitos it is a four-lane, Minor Arterial. Parking is allowed on both sides of the street west of Magnolia Avenue and the posted speed limit is 30 mph.

Broadway is a three lane, one-way eastbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Minor Arterial to the east of Alamitos. Currently, parking is allowed along the north side of the street between Maine Avenue and Magnolia Avenue and between Cedar Avenue and Pacific Avenue. Parking is also allowed on both sides between Magnolia and Cedar Avenue and between Pacific Avenue and Alamitos Avenue. The posted speed limit is 30 mph.

3rd Street is currently designated as a Major Arterial between the I-710 Freeway and Alamitos Avenue in the City of Long Beach Transportation Element of the General Plan. West of Alamitos Avenue, 3rd Street is one-way and provides three lanes in the westbound direction. Parking is allowed on both sides of the roadway. The typical posted speed limit is 30 mph.

6th Street is a three lane, one-way eastbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Minor Arterial to the east of Alamitos. Parking is allowed along some sections of the street and the posted speed limit is 30 mph.

7th Street is a three lane, one-way westbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Regional Corridor to the east of Alamitos. Parking is allowed along some sections of the street and the posted speed limit is 30 mph.

Alamitos Avenue is north-south Regional Corridor extending south from Pacific Coast Highway to Shoreline Drive. In the study area it generally has two northbound and one southbound lane with exclusive turn lanes at most intersections. Alamitos Avenue is an important gateway street for traffic coming into and out of Downtown Long Beach. On-street parking contributes congestion along Alamitos Avenue and along some blocks restricts the southbound traffic to one through lane, except between 7th and 3rd Streets where two southbound lanes are provided between 7AM and 9AM weekdays.

Atlantic Avenue is a four lane, north-south Major Arterial that extends north from Ocean Boulevard to north of I-405. On-street parking is allowed along most of Atlantic Avenue in the study area.

Long Beach Boulevard is a north-south Major Arterial that extends north from Ocean Boulevard to north of I-405. It has a wide median that accommodates the MTA Blue Line light rail with midblock turns restricted at some intersections to accommodate train movements and limit vehicles turning across the tracks.

Pine Avenue is a two-lane, north-south Minor Arterial that is a primary entertainment corridor in the Downtown with many shops, restaurants, and theaters. It extends north from Shoreline Drive to Willow Street.

Pacific Avenue is a north-south Major Arterial that provides access to the Downtown area and contains the northbound portion of the MTA Blue Line transit route Downtown loop. Pacific Avenue has two travel lanes in each direction with no or limited on-street parking depending on the location. The posted speed limit on Pacific Avenue is 30 mph.

Magnolia Avenue provides north-south linkage to the Downtown and the Project area. It is classified as Major Arterial south of 3rd Street and a Minor Arterial to the north in the City of Long Beach Transportation Element of the General Plan. It provides two lanes in each direction south of Broadway and one through lane in each direction to the north, with two-way left-turn lanes and on-street parking on both sides north of Broadway. The posted speed limit on Magnolia Avenue is 25 mph.

I-710 Freeway is a north-south Regional Highway and provides access to the Project area from the communities to the north, as well as the regional Interstate system. The Shoemaker Bridge connects I-710 to Downtown Long Beach and it provides three travel lanes in the northbound direction with the outside lane dropping off as an off-ramp. In the southbound direction, I-710 provides three travel lanes and an auxiliary lane between the 9th Street/Pico Avenue/Pier B/Harbor Scenic Drive on-ramp and off-ramp to 6th Street, which serves Downtown.

South of Anaheim Street interchange, I-710 provides two travel lanes in the northbound and southbound direction with three southbound diverge lanes and two northbound merge lanes to/from Harbor Scenic Drive. North of the study area I-710 is part of the Los Angeles County Congestion Management Program's regional freeway system. Based on year 2008 Caltrans data, average daily traffic (ADT) along I-710 Freeway south of Ocean Boulevard/Harbor Scenic Drive/Pico Avenue Interchange was 51,000 vehicles per day (vpd) and 115,000 vpd south of the Anaheim Street interchange.

The Downtown Community Plan applies to the area shown in **Figure 3**. This area represents the heart of Long Beach and is approximately 631 acres in size, generally lying between Golden Avenue to the west, Alamitos Avenue to the east, 10th Street to the north, and Ocean Boulevard to the south. The Community Plan incorporates zoning, development standards, and design

guidelines to establish design and development criteria in order to guide new development in a way that is consistent with the vision for the Downtown. The Downtown Community Plan area is well connected to the region. It is located in the southwestern portion of Long Beach, within Los Angeles County, approximately 20 miles south of Los Angeles.

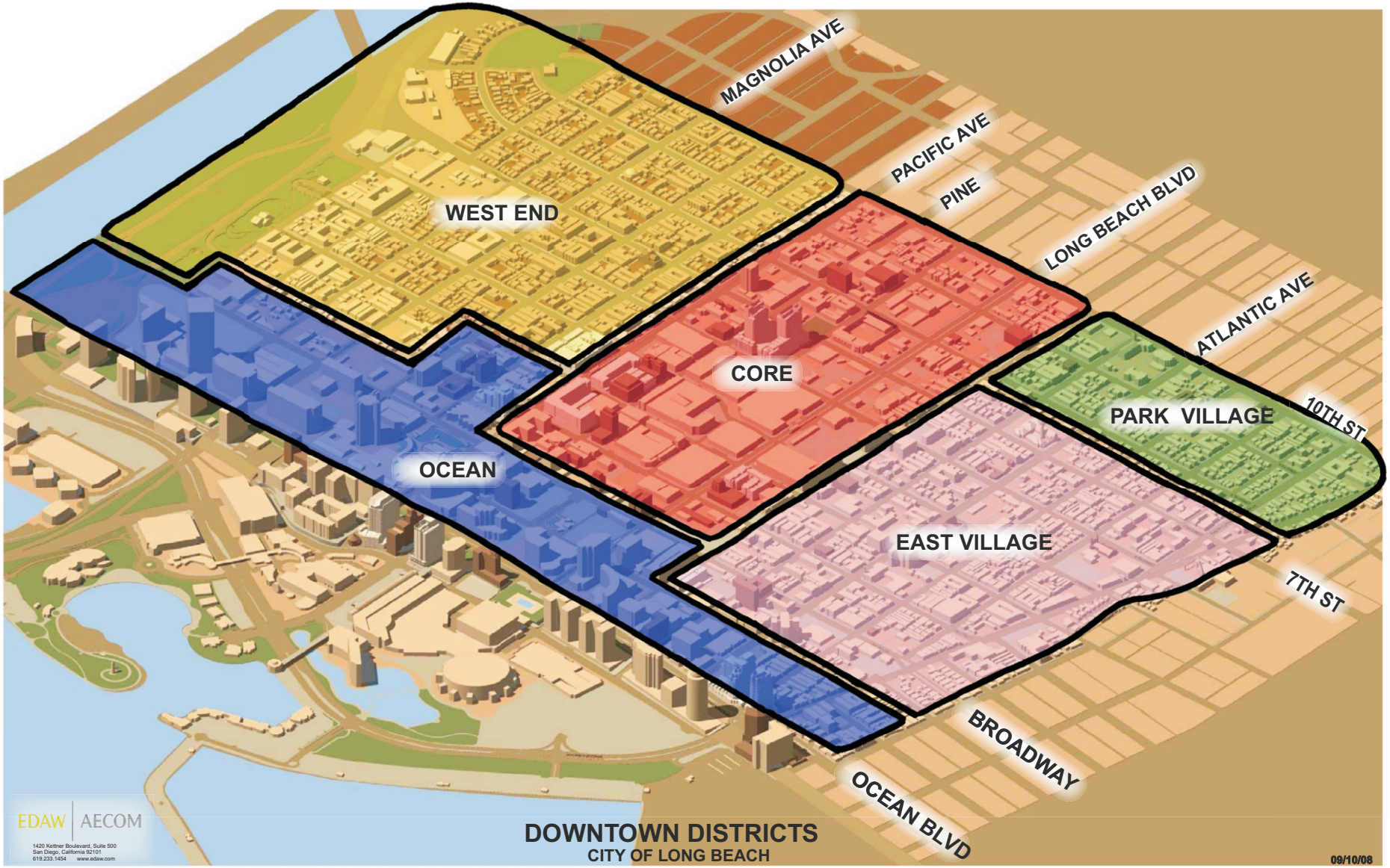


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FIGURE 3
Project Area
Long Beach Downtown Community Plan

3.0 EXISTING CONDITIONS

3.1 TRAFFIC DATA COLLECTION

An extensive field review was undertaken to establish existing traffic operations and conditions within the study area. This included verification of project descriptions, trip generation rates, ambient growth factors, trip distribution patterns, study intersections to be analyzed and special issues to be addressed in the study. A field inventory of intersection geometries, traffic controls, and other roadway conditions was completed with assistance from the City. The existing roadway lane configurations and traffic control are illustrated in **Figures 4A**, **4B** and **4C**. Of the 53 study intersections, new turning movement traffic counts were collected at 28 intersections during the morning (7-9 AM) and afternoon (4-6 PM) peak period during a typical weekday in October 2009. For the remaining 25 study intersections, traffic counts were obtained from counts collected in July, 2008 which are considered current for purposes of this analysis. A summary of the existing intersection traffic volumes are illustrated in **Figures 5A**, **5B** and **5C**.

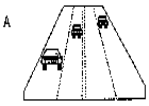
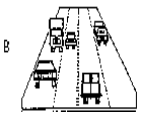
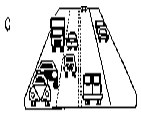
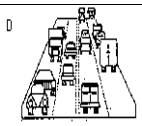
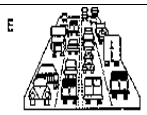
3.2 TRAFFIC OPERATIONS ANALYSIS METHODOLOGY

Consistent with City of Long Beach guidelines for traffic impact analyses, traffic conditions in the vicinity of the project area were analyzed using intersection capacity-based methodology known as the "Intersection Capacity Utilization Methodology" which is referred to hereinafter as the ICU Methodology.

The efficiency of traffic operations at a location is measured in terms of Level of Service (LOS). Level of service is a description of traffic performance at intersections. The level of service concept is a measure of average operating conditions at intersections during an hour. It is based on volume-to-capacity (V/C) ratio. Levels range from A to F with A representing excellent (free-flow) conditions and F representing extreme congestion. The ICU methodology compares the level of traffic during the peak hours at an intersection (volume) to the amount of traffic that intersection is able to carry (capacity). Intersections with vehicular volumes that are at or near capacity ($V/C \cong 1.0$) experience greater congestion and longer vehicle delays.

Table 1 describes the LOS concept and the operating conditions for signalized and stop-controlled intersections.

TABLE 1: INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Signalized Intersection Volume to Capacity Ratio (V/C)
A 	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	0.000-0.600
B 	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	>0.610-0.700
C 	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>0.710-0.800
D 	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues.	>0.810-0.900
E 	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	>0.910-1.000
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 1.000

Source: *Highway Capacity Manual 2000*, Transportation Research Board, Washington, D.C., 2000.

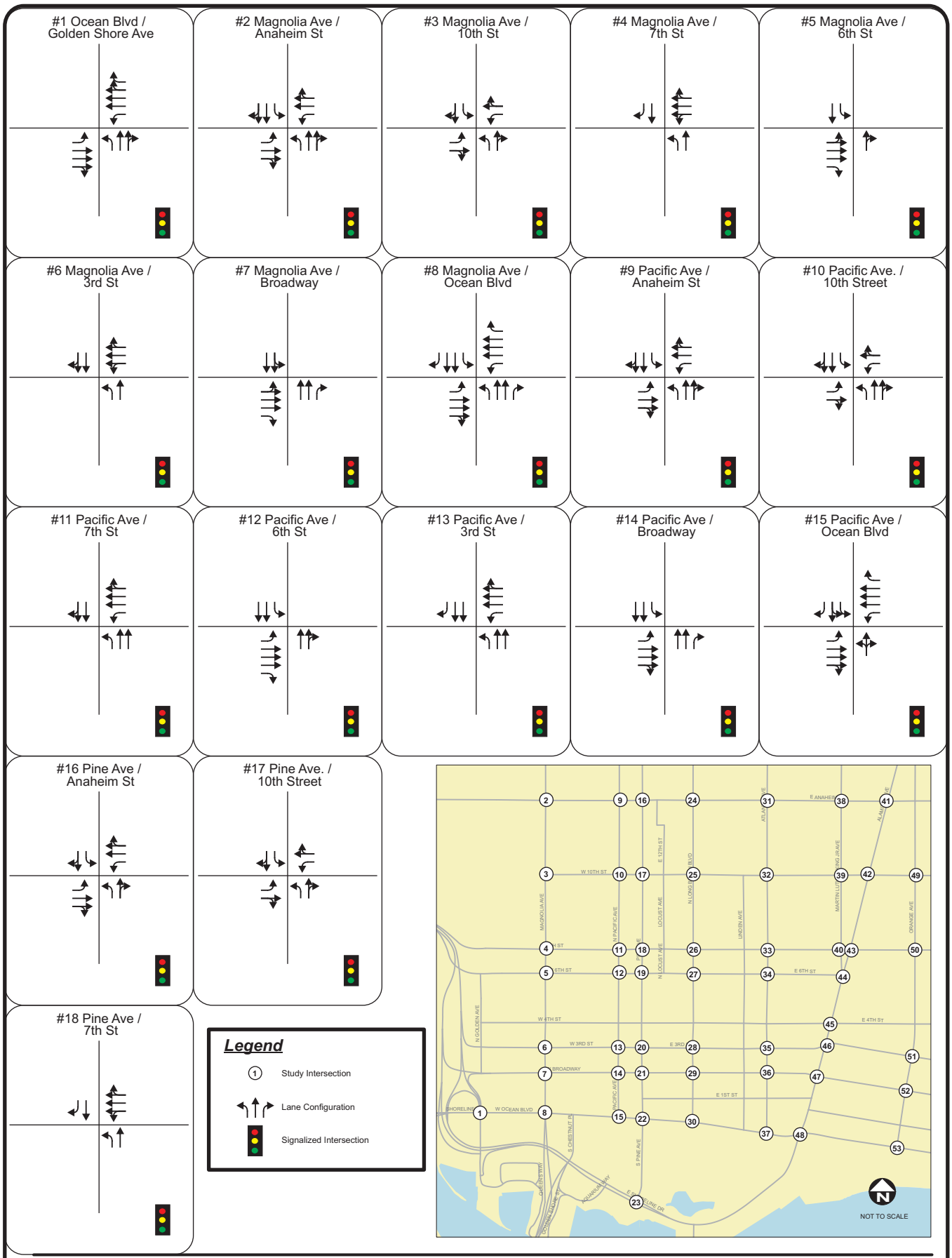


FIGURE 4A
Existing Lane Configuration & Traffic Control
Long Beach Downtown Community Plan

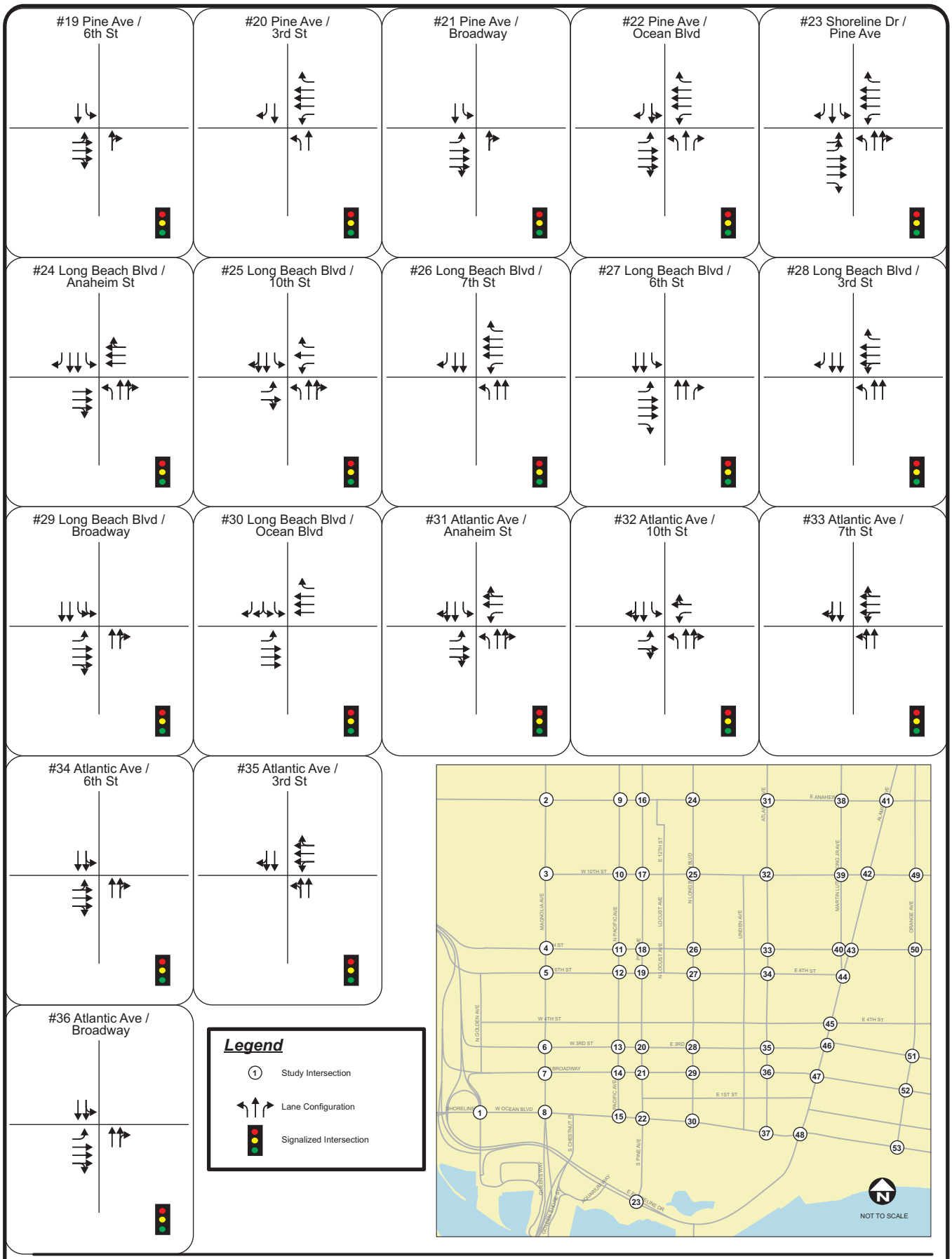


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FIGURE 4B
Existing Lane Configuration & Traffic Control
Long Beach Downtown Community Plan

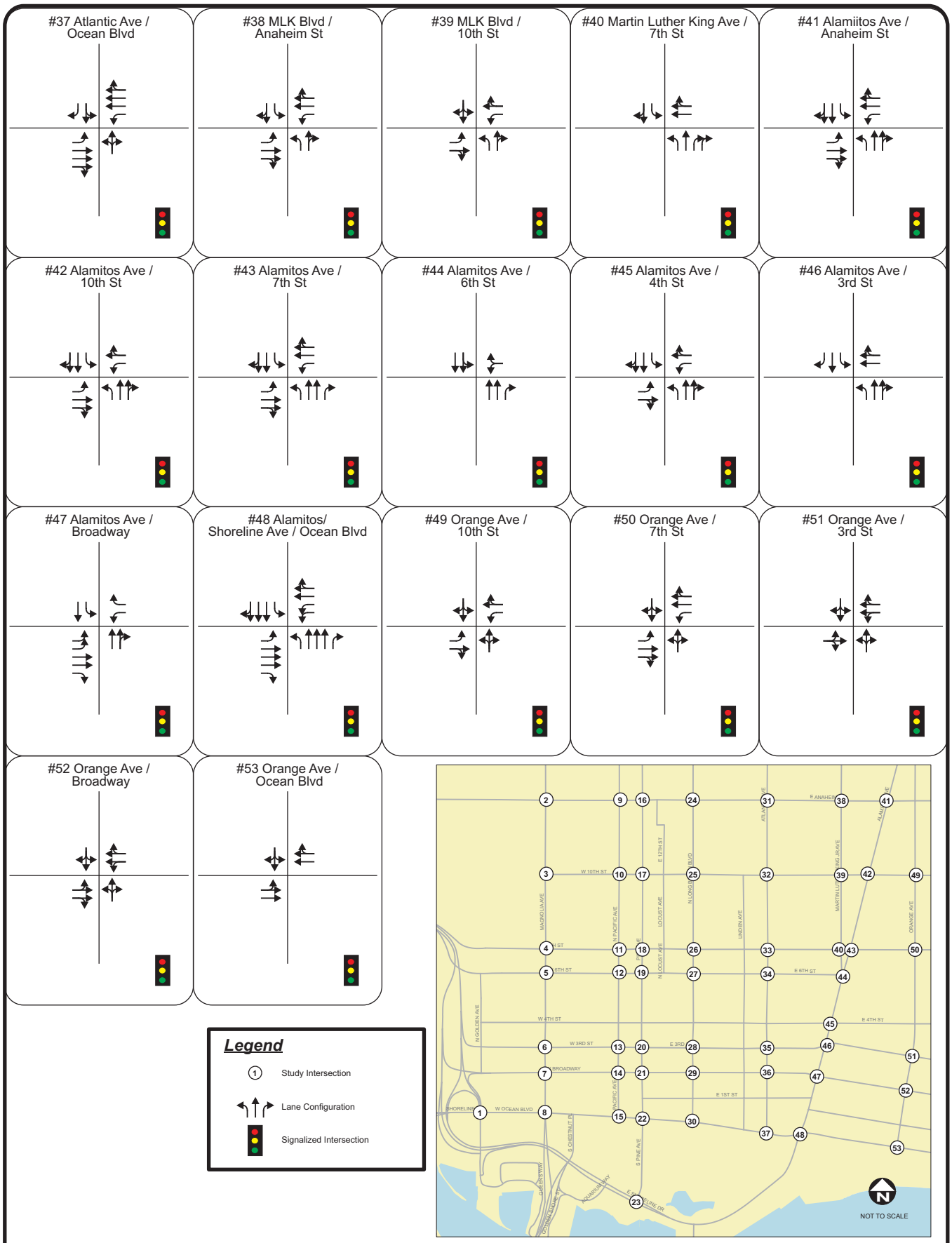

FIGURE 4C
Existing Lane Configuration & Traffic Control
Long Beach Downtown Community Plan

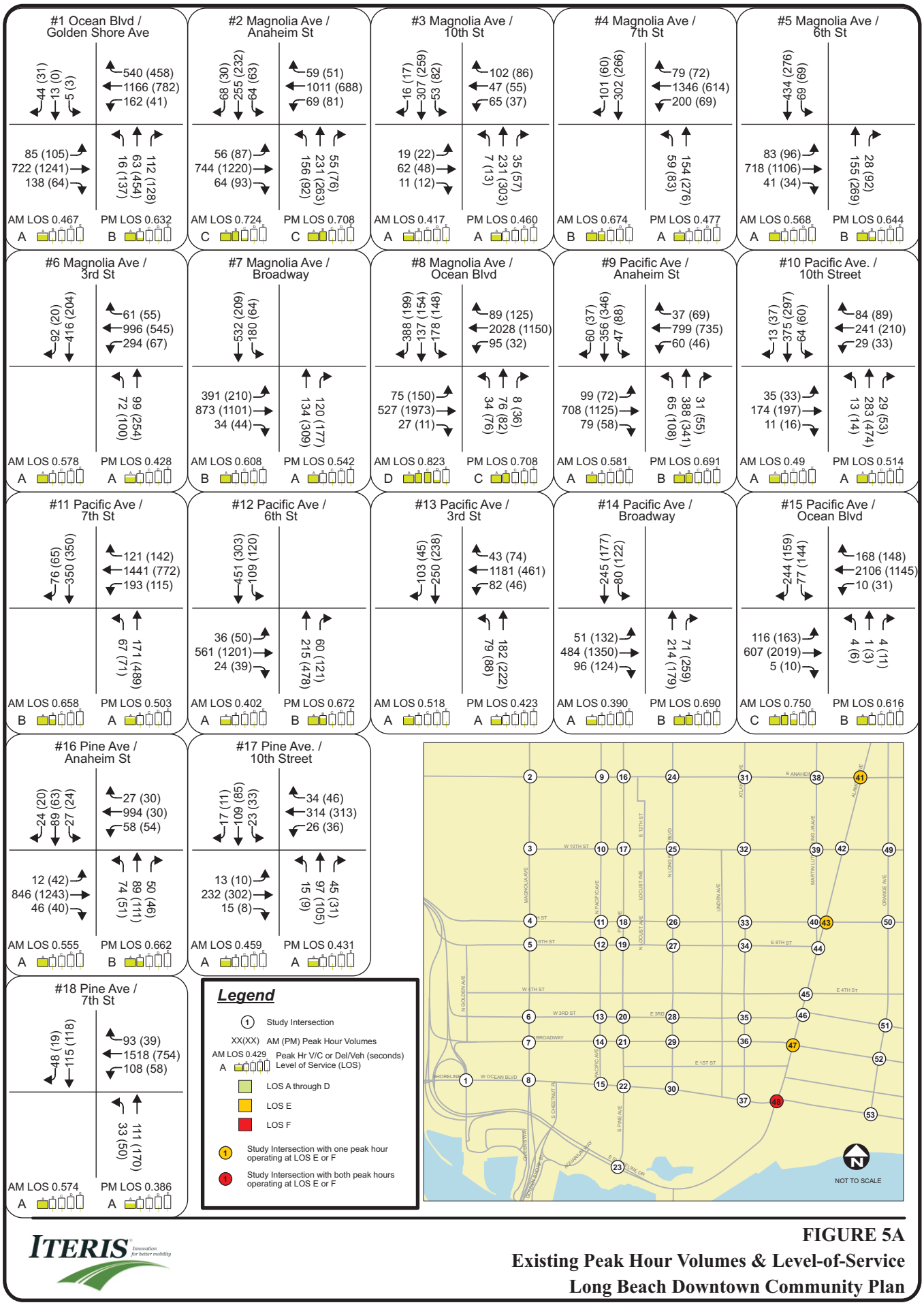

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FIGURE 5A

Existing Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

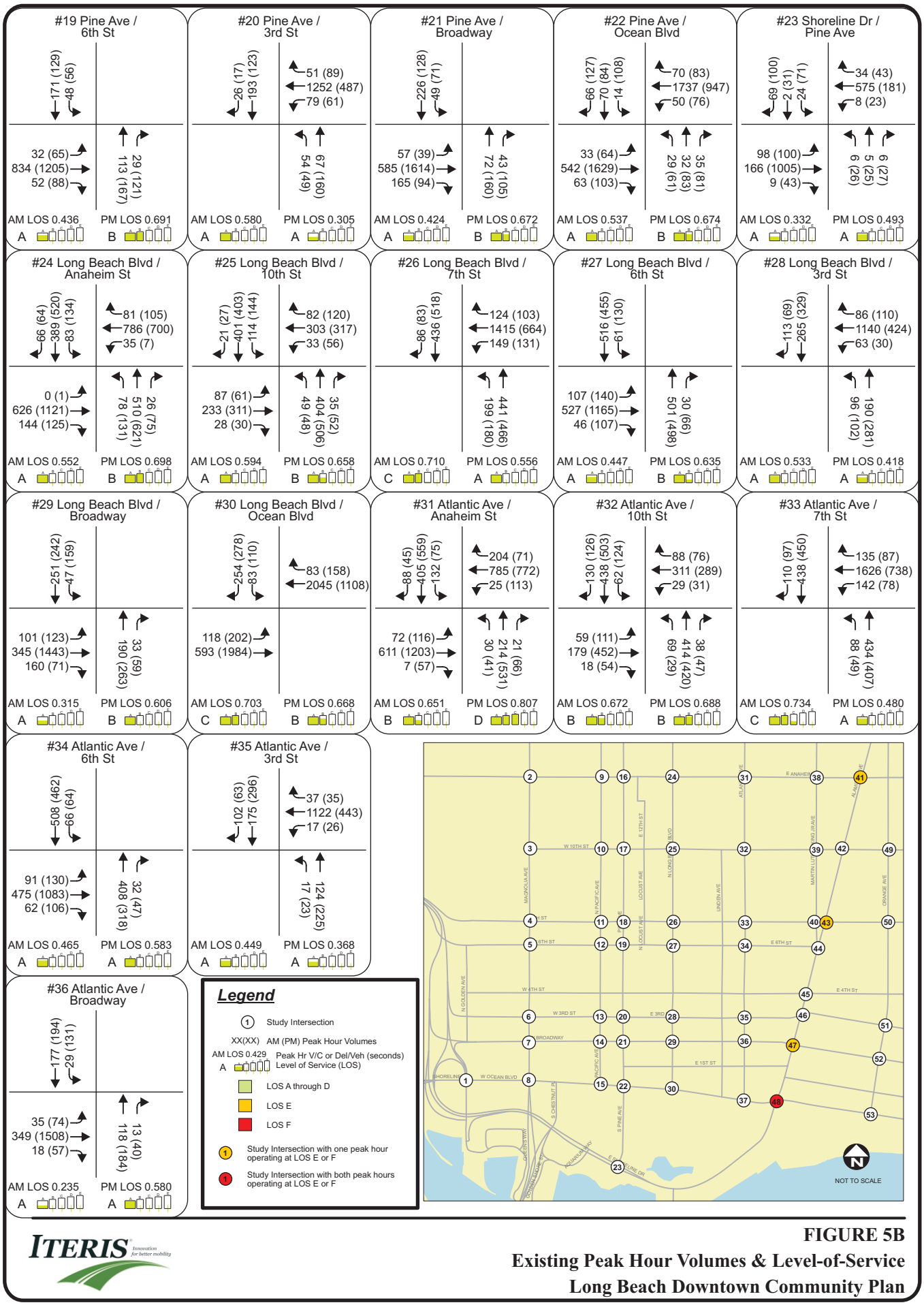

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FIGURE 5B

Existing Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

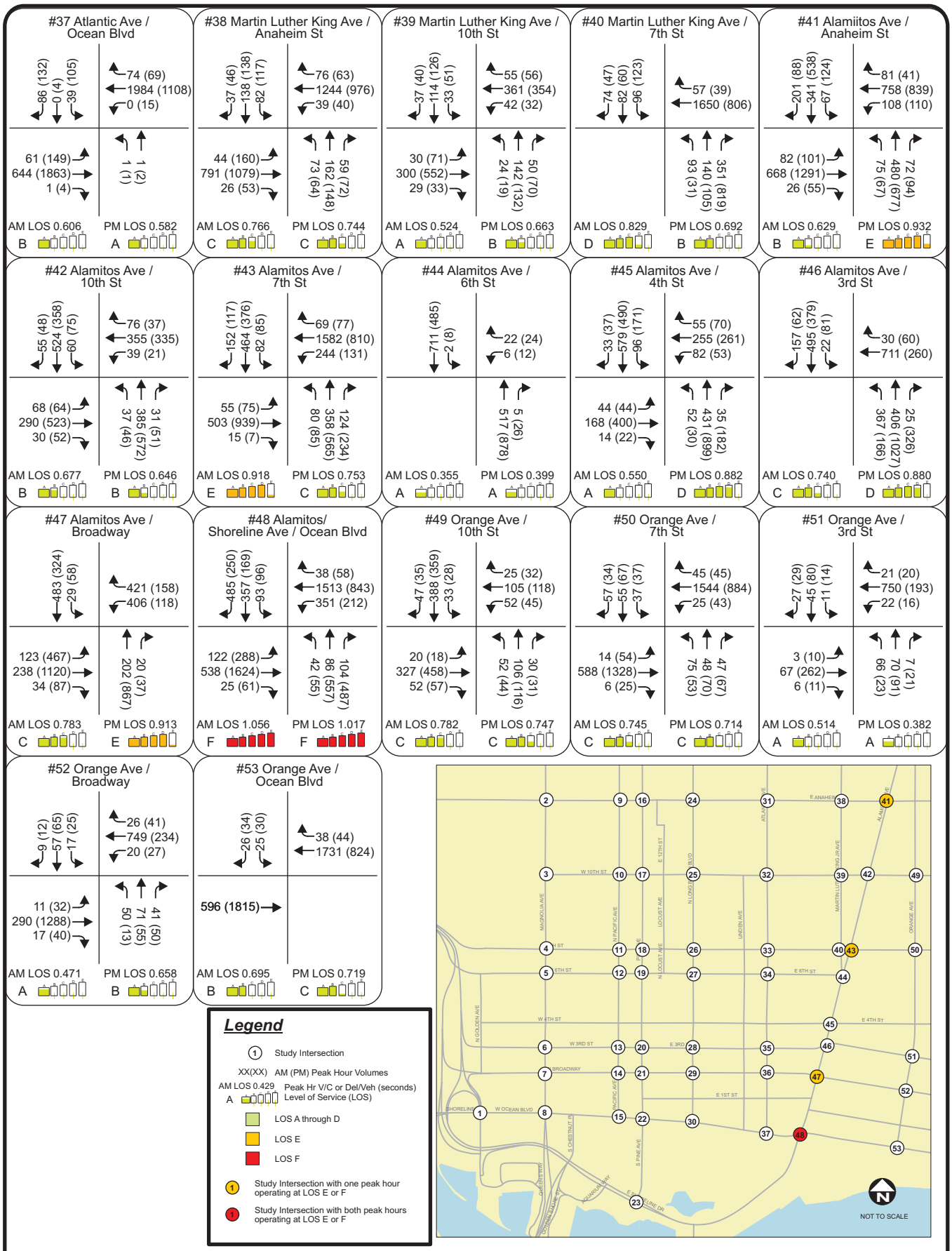


FIGURE 5C

Existing Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

3.3 EXISTING TRAFFIC OPERATIONS ANALYSIS

AM and PM peak-hour LOS analyses were conducted for the 53 study intersections based on the measured traffic volumes, geometries, and the previously described methodologies. All intersection analyses are performed using the TRAFFIX (Traffic Impact Analysis) software program except the Alamitos Avenue/3rd Street intersection (#46), where SYNCHRO 6 traffic analysis software is used. The Alamitos Avenue/3rd Street intersection operates with unique signal phasing where the northbound left-turn movement and the westbound through movement share the same signal phase. The west leg of 3rd Street at this intersection has three receiving lanes and therefore no conflict is associated with the northbound left-turning traffic and the westbound through traffic. The existing conditions LOS analyses results are summarized in **Table 2** and are also shown in **Figures 5A**, **5B** and **5C**.

LOS D is generally considered to be the lowest acceptable LOS in an urban such as the Long Beach Downtown plan area. LOS E and F are considered to be unacceptable operating conditions that warrant mitigation. The results, shown in **Table 2**, indicate that 4 of the 53 study intersections are currently operating at LOS E or F during either the AM or PM peak hour or both. The remaining 49 intersections currently operate at LOS D or better. The intersections that currently operate at levels of service E or F are:

- Alamitos Avenue and Anaheim Street (#41) – LOS E (PM Peak Hour)
- Alamitos Avenue and 7th Street (#43) – LOS E (AM Peak Hour)
- Alamitos Avenue and Broadway (#47) – LOS E (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard (#48) – LOS F (AM and PM Peak Hour)

TABLE 2: EXISTING INTERSECTION LEVELS OF SERVICE

	Intersection	Existing			
		AM		PM	
		LOS	V/C	LOS	V/C
1	Ocean Blvd / Golden Shore Ave	A	0.47	B	0.63
2	Magnolia Ave / Anaheim St	C	0.72	C	0.71
3	Magnolia Ave / 10th St	A	0.42	A	0.46
4	Magnolia Ave / 7th St	B	0.67	A	0.48
5	Magnolia Ave / 6th St	A	0.57	B	0.64
6	Magnolia Ave / 3rd St	A	0.58	A	0.43
7	Magnolia Ave / Broadway	B	0.61	A	0.54
8	Magnolia Ave / Ocean Blvd	D	0.82	C	0.71
9	Pacific Ave / Anaheim St	A	0.58	B	0.69
10	Pacific Ave. / 10th Street	A	0.49	A	0.51
11	Pacific Ave / 7th St	B	0.66	A	0.50
12	Pacific Ave / 6th St	A	0.40	B	0.67
13	Pacific Ave / 3rd St	A	0.52	A	0.42
14	Pacific Ave / Broadway	A	0.39	B	0.69
15	Pacific Ave / Ocean Blvd	C	0.75	B	0.62
16	Pine Ave / Anaheim St	A	0.56	B	0.66
17	Pine Ave. / 10th Street	A	0.46	A	0.43
18	Pine Ave / 7th St	A	0.57	A	0.39
19	Pine Ave / 6th St	A	0.44	B	0.69
20	Pine Ave / 3rd St	A	0.58	A	0.31
21	Pine Ave / Broadway	A	0.42	B	0.67
22	Pine Ave / Ocean Blvd	A	0.54	B	0.67
23	Shoreline Dr / Pine Ave	A	0.33	A	0.49
24	Long Beach Blvd / Anaheim St	A	0.55	B	0.70
25	Long Beach Blvd / 10th St	A	0.59	B	0.66
26	Long Beach Blvd / 7th St	C	0.71	A	0.56
27	Long Beach Blvd / 6th St	A	0.45	B	0.64
28	Long Beach Blvd / 3rd St	A	0.53	A	0.42
29	Long Beach Blvd / Broadway	A	0.32	B	0.61
30	Long Beach Blvd / Ocean Blvd	C	0.70	B	0.67
31	Atlantic Ave / Anaheim St	B	0.65	D	0.81
32	Atlantic Ave / 10th St	B	0.67	B	0.69
33	Atlantic Ave / 7th St	C	0.73	A	0.48
34	Atlantic Ave / 6th St	A	0.47	A	0.58
35	Atlantic Ave / 3rd St	A	0.45	A	0.37
36	Atlantic Ave / Broadway	A	0.24	A	0.58
37	Atlantic Ave / Ocean Blvd	B	0.61	A	0.58
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74
39	Martin Luther King Ave / 10th	A	0.52	B	0.66
40	Martin Luther King Ave / 7th S	D	0.83	B	0.69
41	Alamiitos Ave / Anaheim St	B	0.63	E	0.93
42	Alamitos Ave / 10th St	B	0.68	B	0.65
43	Alamitos Ave / 7th St	E	0.92	C	0.75
44	Alamitos Ave / 6th St	A	0.36	A	0.40
45	Alamitos Ave / 4th St	A	0.55	D	0.88
46	Alamitos Ave / 3rd St (*)	C	0.74	D	0.88
47	Alamitos Ave / Broadway	C	0.78	E	0.91
48	Alamitos/Shoreline Ave / Ocean	F	1.06	F	1.02
49	Orange Ave / 10th St	C	0.78	C	0.75
50	Orange Ave / 7th St	C	0.75	C	0.71
51	Orange Ave / 3rd St	A	0.51	A	0.38
52	Orange Ave / Broadway	A	0.47	B	0.66
53	Orange Ave / Ocean Blvd	B	0.70	C	0.72

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
(*) LOS reported is based on analysis using SYNCHRO 6 software because of the unique signal phase at this intersection.

3.4 EXISTING TRANSIT SERVICE

The four transit agencies that provide service to Downtown Long Beach are Metropolitan Transportation Authority (METRO), Long Beach Transit (LBT), Los Angeles Department of Transportation (LADOT) and Orange County Transportation Authority (OCTA). Together, the four transit agencies run bus routes and a rail line within and adjacent to the boundaries of the proposed project area, as described below:

<u>METRO Bus Service</u>
METRO operates two bus lines daily through the 1st Street transit mall:
Metro Line 6 (Long Beach Boulevard - Santa Fe Avenue)
Metro Line 232 (Long Beach Transit Station – LAX City Bus Center)

<u>METRO "Blue Line" Rail Service</u>
In addition to the 17 bus lines operating within the proposed project area, there is also one Metro light rail line that travels through Downtown Long Beach. The Metro Blue Line is part of the Metro Rail Transit System that runs north-south from Los Angeles to Long Beach. The Metro Blue Line starts at 7th Street/Metro Center/Julian Dixon in Downtown Los Angeles and travels south via Long Beach Avenue, Willowbrook Avenue, and Long Beach Boulevard to its final destination at the Long Beach Transit Mall. The train operates Monday through Sunday, including all major holidays.

<u>Long Beach Transit Bus Service</u>
Long Beach Transit operates 28 bus routes through the 1st Street transit mall:
Long Beach Transit Line 1 (Easy Avenue)
Long Beach Transit Line 7 (Orange Avenue)
Long Beach Transit Line 21 (Cherry Avenue)
Long Beach Transit Line 22 (Downey Avenue)
Long Beach Transit Line 23 (Cherry to Carson Street Only)
Long Beach Transit Line 46 (Anaheim Street to Downtown Long Beach)
Long Beach Transit Line 51 (Long Beach Boulevard to Artesia Station)
Long Beach Transit Line 52 (Long Beach Boulevard to Artesia Boulevard)
Long Beach Transit Line 61 (Atlantic Avenue to Artesia Station)
Long Beach Transit Line 62 (Atlantic Avenue to Alondra Boulevard)
Long Beach Transit Line 63 (Atlantic Avenue to Artesia Boulevard)
Long Beach Transit Line 66 (ZAP Atlantic)
Long Beach Transit Line 81 (10th Street to CSULB)
Long Beach Transit Line 91 (7th Street / Bellflower Boulevard)
Long Beach Transit Line 92 (7th Street / Woodruff Avenue)
Long Beach Transit Line 93 (7th Street / Clark Avenue)
Long Beach Transit Line 94 (7th Street to Los Altos Only)
Long Beach Transit 96 ZAP (The 96 ZAP 7th Street)
Long Beach Transit Line 111 (Broadway / Lakewood Boulevard)
Long Beach Transit Line 112 (Broadway / Clark Avenue)

Long Beach Transit Line 172 (PCH / Palo Verde)
Long Beach Transit Line 173 (PCH / Studebaker)
Long Beach Transit Line 174 (PCH / Ximeno Avenue Only)
Long Beach Transit Line 181 (Magnolia / 4th Street)
Long Beach Transit Line 182 (Pacific Avenue / 4th Street)
Long Beach Transit Line 191 (Santa Fe / Del Amo Boulevard)
Long Beach Transit Line 192 (Santa Fe / South Street)
Long Beach Transit Line 193 (Santa Fe via McHelen to Del Amo Station)

Passport Routes A, B, C and D:
In addition, LBT operates free shuttle buses (the Passport) in the Downtown area and between major attractions near the Downtown:

Route A provides free ride service between Alamitos Bay Landing and Catalina Landing.
Route B runs from Pine Avenue at 1st Street through Downtown Long Beach's East Village, West Gateway and hotspots. Route C provides service between Pine Avenue, Downtown Long Beach and Queen Mary. Route D provides service between Los Altos Market Center and Catalina Landing.

Within the study area, Routes A and D traverse the study area on Ocean Boulevard and operate throughout the day, Monday through Sunday. Route B and C traverse the study area on 3rd Street. On weekdays, Route B's Daily East Village Tour only operates from 10:00 AM to 6:55 PM and Route B's Daily West Gateway Tour only operates from 9:40 AM to 7:15 PM. Route C operates throughout the day, Monday through Sunday.

During the AM and PM peak hour in the eastbound/westbound directions, Routes A and D provides headways of 2 buses in each direction. During the PM peak hour the Route B's Daily East Village Tour provides headways of 1 bus and the Route B's Daily West Gateway Tour provides headways of 2 buses. During AM peak hour in the southbound/northbound directions, Route C provides headways of 4 buses in each direction. During PM peak hour in the southbound/northbound directions, Route C provides headways of 6 buses in each direction.

<u>LADOT Transit Service</u>
The Los Angeles Department of Transportation (LADOT) Commuter Express Line 142 (San Pedro / Terminal Island / Long Beach Express) runs predominately east-west from Ports O'Call and Sampson in San Pedro to the Long Beach Transit Mall via 10th Street, SR-47, Ocean Boulevard and Long Beach Boulevard. It operates Monday through Sunday, including all major holidays.

<u>OCTA Transit Service</u>
Orange County Transportation Authority (OCTA) Route 60 (Long Beach to Tustin) operates through the 1st Street transit mall. It runs east-west from the Long Beach Transit Mall to Larwin Square in Tustin via 7th Street, Westminster and 17th Street. It operates Monday through Sunday, including all major holidays.

4.0 FUTURE YEAR TRAFFIC CONDITIONS AND ANALYSIS

The anticipated build out year of the Cumulative Projects and Downtown Community Plan is expected to be completed by year 2035. The projection of year 2035 "Without Project" traffic consists of existing traffic plus growth in traffic generated by specific Cumulative Projects expected to be completed by 2035. The year 2035 "With Project" traffic consists of Without Project plus the Downtown Community Plan growth within the study area with the build out anticipated to be completed by year 2035. Per guidance from the City of Long Beach staff, future year analysis is based on existing intersection geometry.

4.1 GROWTH FROM CUMULATIVE PROJECTS AND THE DOWNTOWN COMMUNITY PLAN

The City provided with a list of Cumulative Projects to include in the Without Project scenario. The Cumulative Projects are known as reasonably foreseeable developments that will occur before build out of Community Plan. The Cumulative Projects list includes residential, office, retail, restaurant and hotel land uses. Traffic resulting from these projects is used to assess conditions prior to the implementation of the Downtown Community Plan. Traffic studies sometimes utilize a background ambient growth rate to account for miscellaneous smaller projects and growth, plus area wide growth, which cannot be predicted by the specified cumulative project. In the case of the Downtown Long Beach Community Plan, however, there is no need to apply an ambient growth factor. In fact, use of an additional ambient background growth factor would have resulted in an unrealistically high growth forecast for the following reasons:

- The plan itself accounts for all potential development and growth within the plan's study area, including residential, office, commercial, hotel and other growth, and
- Due to the unique geographic location of Downtown, very little or no "through traffic" growth is anticipated within the study area. While some traffic today passes through Downtown as "through" traffic (such as traffic from I-710 to the East Long Beach area, nominal growth in such traffic is projected to occur in the future. Also, there is no through traffic growth to the south since Downtown is bordered by the ocean, and to the west the growth is primarily port-oriented, and port traffic will primarily use I-710 and other routes and will not travel within Downtown.

Thus, the use of the Cumulative Projects in combination with the estimated build out of the Downtown Community Plan is considered reasonably conservative for forecasting future conditions in the study area.

4.2 TRIP GENERATION

The trip generation analysis was completed in a two step process. The first step was to estimate the unadjusted trip generation rates for the Cumulative Projects and the Downtown Community Plan using the ITE trip rates. The second step was to then apply the trip reduction adjustments discussed above to the ITE trip rates to provide customized trip rates for the Downtown Long Beach area. The specific commercial land uses are not known until actual projects come forward

in the future. For example, commercial zoning allows many different types of land uses including various types of retail as well as restaurant uses. Per guidance from city staff, the restaurant land use density was calculated assuming it represents 20% of the total retail land uses.

The Downtown area is a very unique location in that it has a wide mix of land uses, relatively higher density and is very pedestrian and bicycle friendly. In addition, the transit services in Long Beach in general, and especially within Downtown, provides more person carrying capacity than in the rest of the southern California region. Thus, it is important to make adjustments to the ITE trip rates to reflect the types of trip interactions and mode share of transit and bike/walk that occur in Downtown. ITE trip rates generally represent suburban locations with little mixed land use interaction and very low transit, bike or walk mode split, thus they must be adjusted to reflect the conditions with Downtown Long Beach. Reasonable trip reductions have been developed to account for pass-by and non-auto trips based on various sources including information in the *ITE Trip Generation* publications, *Year 2000 US Census Journey to Work* and empirical studies of transit mode split in Downtown Long Beach. The following adjustments are made to the trip generation to reflect the unique characteristics of Downtown Long Beach:

- Pass-by trip generation rate adjustments – pass-by trips are those trips that are not made specifically from home to a destination such as shopping, but instead are made as part of another trip. For example, a trip from home to work may result in a "drop-in" trip to the shopping area or to a grocery store. These are known as "pass-by" trips because they occur when the driver is passing by the commercial area, on route to/from a different origin/destination. Thus they are not unique new trips but are part of another trip that is already on the roadway system. These types of trips are well known and researched and are documented in the ITE Trip Generation Manual. The ITE pass-by trip reduction adjustments were used in this study for commercial and restaurant uses. For this study, the pass-by reduction was assumed to be 50%, applied to retail commercial uses and a conservative 20% to 43% to restaurant land uses based on its proximity to the Pine Avenue core commercial district.

- Transit service trip generation rate adjustment – Downtown Long Beach has significant transit services which are much more comprehensive than most of southern California. The Downtown area is served by many Long Beach Transit (LBT) bus routes, METRO bus routes, the METRO Blue Line light rail line, DASH services from the Los Angeles Department of Transportation and also by the local fixed route shuttle run by LBT called the Passport. An analysis was completed of mode share (percent of trips via auto versus transit) based on review of actual vehicle trips into and out of Downtown Long beach, plus data from the 2000 US Census Journey to Work data. That analysis was used to develop an adjustment to trip rates to reflect the trips that will occur via transit instead of passenger auto mode. The transit mode share adjustment that has been applied is 26% percent. Note that it is applied only to home-to-work trips, which are the most common type of trips to occur on transit. This is a conservative assumption, since some of the

commercial trips will also occur on transit, but are not included thus they are all assumed to occur via passenger auto.

- Other mode trip generation rate adjustments - Adjustments are applied for other modes including walk and bike to account for the density in Downtown and the mixed use nature of the area. There is a strong initiative to increase bicycle ridership via both bicycle facility expansion and also bicycle programs and education. In addition, both the Downtown plan and City's Framework element strongly encourage and plan for more walk and bike trips in the City and in Downtown. Downtown Long Beach is also a very favorable area for walking due to the mixed use nature of the lane uses, the density and the weather conditions year around. While there is no way to precisely forecast the number of walk and bike trips that will occur, it is known that many people currently walk from work to lunch, to shopping and other uses. As the residential component in Downtown increases, there will be more trips from home to shopping and work made without using autos. Thus, a conservative walk/bike mixed use adjustment of ten percent is applied to office/work trips. This adjustment is not applied to commercial trips, to be conservative, since the pass-by adjustment was already applied.

Tables 3 and 4 summarize total net future trip generation of the Cumulative Projects (Without Project) and other Downtown Community Plan (With Project) growth within the study area by traffic analysis zone. Note that the trips are net trips and they account for all of the adjustments described above. The trip generation forecasts for the Cumulative Projects and the Downtown Community Plan are summarized as follows:

- Cumulative Project Vehicle Trips – 38,994 daily trips, 2,419 Am peak hours trips (accounting for all adjustments) and 2,716 PM peak hour trips (accounting for all adjustments)
- Downtown Plan Vehicle Trips – 91,439 daily trips, 5,338 Am peak hours trips (accounting for all adjustments) and 6,273 PM peak hour trips (accounting for all adjustments)
- Total Added Vehicle Trips – 130,433 daily trips, 7,757 Am peak hours trips (accounting for all adjustments) and 9,034 PM peak hour trips (accounting for all adjustments)

At this point, due to the conceptual stage of the Downtown Community Plan, the precise locations of the land uses are not known. Therefore, Downtown study area was divided into a series of Traffic Analysis Zones (TAZ) as shown in **Figure 2**. Trip generation and trip distribution are determined for each project zone based on the forecast land use within each zone. These added trips were applied to the current traffic volumes on the study area roadway system, and the resultant system level of service conditions was then analyzed.

TABLE 3: SUMMARY TRIP GENERATION OF CUMULATIVE PROJECTS

Land Use Zones	Pending/Approved Projects					Total Trips Generated by Cumulative Projects						
						AM			PM			Daily
	Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)	Total Trips	Ins	Outs	Total Trips	Ins	Outs	Total Trips
Cumulative Projects (without Project Scenario)												
3	291	535.00	8.00	2.00		673	513	160	683	195	488	5,965
12	624		16.74	4.18		258	81	177	329	200	128	5,821
13	166		14.90	3.72		141	58	83	185	106	79	3,444
14	96		3.70	0.92	191	158	72	86	196	109	87	3,617
24	324		10.10	2.53		161	53	108	205	123	82	3,640
28	1,586	340.00	37.42	9.36	265	1,027	554	473	1,163	552	611	16,507
Subtotal	1,501	535.00	53.44	13.35	191	**2,419**	**1,331**	**1,087**	**2,761**	**1,285**	**1,476**	**38,994**

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.
Reduction for Pass-By, Transit Trips were applied only to the AM and PM peak hours only.
Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density.
No reductions are applied to the daily total trips.

TABLE 4: SUMMARY TRIP GENERATION OF DOWNTOWN COMMUNITY PLAN

Land Use Zones	Downtown Community Plan					Total Trips Generated by the Community Plan						
						AM			PM			Daily
	Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)	Total Trips	Ins	Outs	Total Trips	Ins	Outs	Total Trips
Downtown Community Plan (with Project Scenario)												
2	40					18	3	15	21	14	7	290
3		150.00	4.00	1.00		224	188	36	227	54	174	1,880
4	500	250.00	12.00	3.00	60	521	331	190	567	227	341	7,039
5	80					32	5	27	37	25	12	530
6	20					11	2	9	12	8	4	159
7	280		48.00	12.00		298	133	165	392	220	172	7,315
8	320					97	16	80	115	77	38	1,769
9	800	460.00	64.00	16.00		938	597	341	1,045	428	617	13,468
10	320	55.00				183	92	91	219	95	124	2,151
11	280	60.00				179	96	83	212	88	124	1,987
12	340	110.00				251	149	102	271	107	164	2,564
13	320	175.00	100.00	25.00		698	421	277	832	383	449	12,786
14	180	175.00				278	202	77	275	83	193	2,120
15	120					44	8	37	52	35	17	754
16	20					11	2	9	12	8	4	159
17	280		64.00	16.00	60	374	175	199	500	277	222	9,600
18	20		28.00	7.00	120	199	107	92	273	144	129	5,465
19	220		64.00	16.00	240	449	220	229	546	297	249	10,913
20	110	65.00				140	94	46	160	51	109	1,141
21	20					11	2	9	12	8	4	159
22	240				40	90	20	70	115	74	41	2,109
23	140				120	101	36	66	129	77	53	2,309
24	180				100	102	32	70	131	80	52	2,341
25	20				20	16	5	11	24	14	9	711
26	40					18	3	15	21	14	7	290
27	110				40	54	14	40	72	45	27	1,430
Subtotal	5,000	1,500.00	384.00	96.00	800	**5,338**	**2,952**	**2,386**	**6,273**	**2,932**	**3,341**	**91,439**
TOTAL						**7,757**	**4,284**	**3,474**	**9,034**	**4,217**	**4,817**	**130,433**

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.
Reduction for Pass-By, Transit Trips were applied only to the AM and PM peak hours only.
Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density.
No reductions are applied to the daily total trips.

Table 6 provides a summary of trips based on type of land use. As seen in **Table 5**, office land uses contribute approximately 37% and 30% (in the AM and PM peak hour, respectively) of the total trips associated with the Cumulative Projects. Similarly, office land uses contribute approximately 34% and 28% during the AM and PM peak hours of the total trips associated with

implementation of the Community Plan within the study area. Residential land uses contribute a third of the added cumulative project trips and 30 percent of the trips associated with the Community Plan growth. The next highest generator of trips is retail, restaurant land use, and hotels contribute ten percent or less of the added new trips. Thus residential and office land uses combined account for approximately two-thirds of the added trips.

TABLE 5: FUTURE PEAK HOUR TRIPS BY LAND USE TYPE

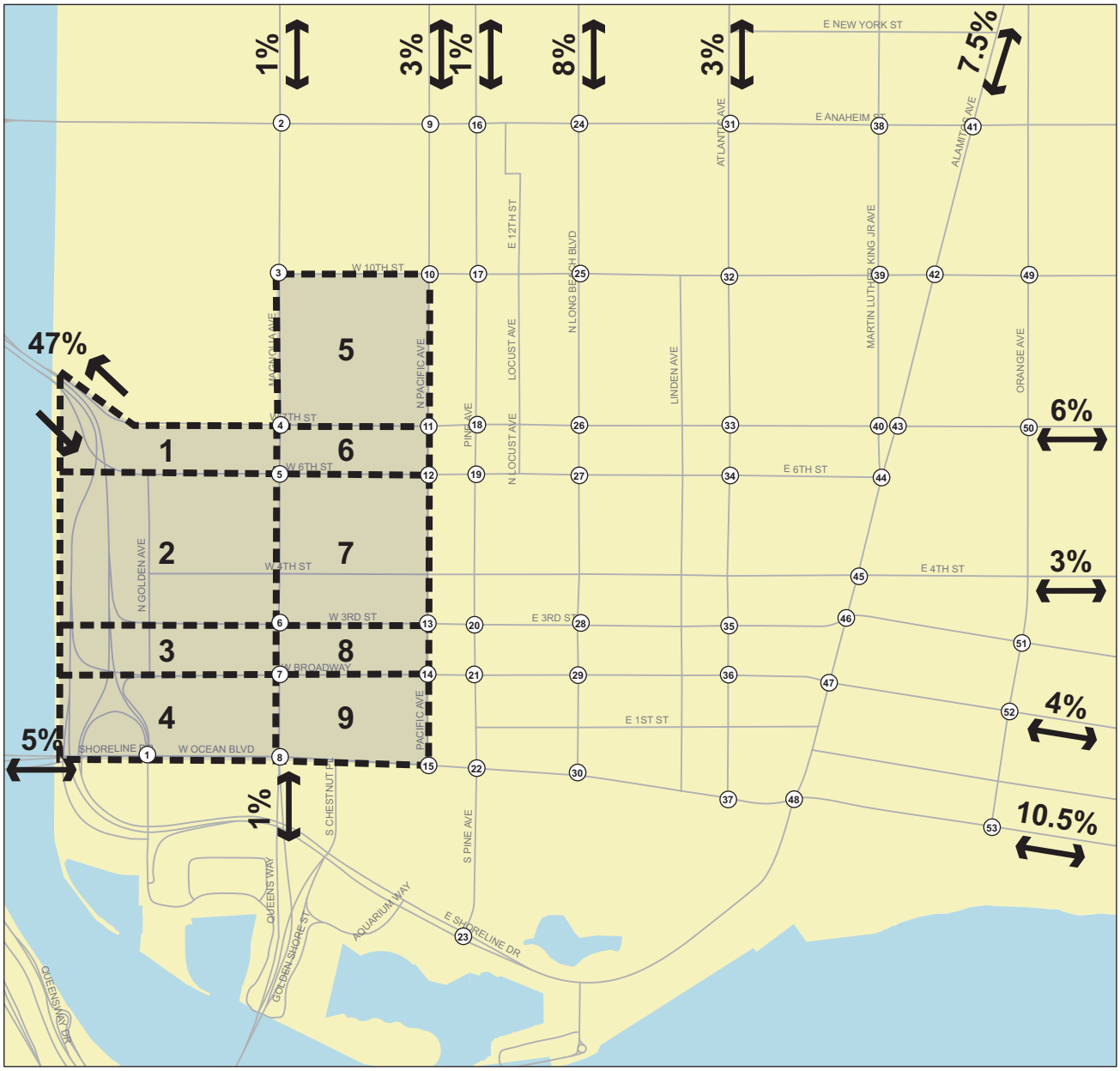
	Land Use	Total AM Trips	Ins	Outs	Total PM Trips	Ins	Outs	Total Daily Trips	Percent Total Daily Trips by land use type	
									AM	PM
Cumulative Projects	Residential	796	135	661	963	645	318	15,325	33%	35%
	Office	900	792	108	842	143	699	4,632	37%	30%
	Shopping Center	286	175	112	511	251	261	11,321	12%	19%
	Restaurant	208	108	100	176	104	72	2,888	9%	6%
	Hotel	228	121	107	269	143	126	4,828	9%	10%
	Sub-Total	**2,419**	**1,331**	**1,087**	**2,761**	**1,285**	**1,476**	**38,994**		
Downtown Community Plan	Residential	1,563	266	1,297	1,855	1,243	612	28,153	29%	30%
	Office	1,812	1,595	217	1,768	301	1,468	8,797	34%	28%
	Shopping Center	749	457	292	1,469	720	749	31,767	14%	23%
	Restaurant	875	455	420	709	418	291	12,205	16%	11%
	Hotel	340	180	160	472	250	222	10,517	6%	8%
	Sub-Total	**5,338**	**2,952**	**2,386**	**6,273**	**2,932**	**3,341**	**91,439**		
	Grand Total	**7,757**	**4,284**	**3,474**	**9,034**	**4,217**	**4,817**	**130,433**		

4.3 TRIP DISTRIBUTION

The next step in the traffic study process is to apply the trips estimated in the trip generation analysis to the roadway network. This requires an estimation of the geographic distribution of trips and the direction and routes the added trips will take to, from and within the Downtown Plan area. The routes people will use traveling to and from the related project sites and the plan area was determined based on several sources of information including the patterns of existing traffic for similar types of developments, patterns listed in previous traffic studies for the area, and based on a review of the regional travel demand model developed by the Southern California Association of Governments. The trips generated by the related projects were assigned to the area street system based on this data and the resulting directional distribution.

Figures 6 and **7** illustrate the trip distribution assumptions for future added project trips. There are two sets of trip distribution assumptions, representing the western and eastern portions of Downtown. The distribution differs for each of the two areas because of the proximity to the I-710 freeway, the proximity to various major arterials and other factors that influence route choice in east versus west Downtown Long Beach. In addition, a unique trip distribution pattern is applied in the model for various traffic analysis zones based on which arterial roadways serve a particular zone, the type of land uses, and proximity to the freeway. For the zones in the west area, the percent of traffic to/from I-710 is assumed to be just less than half, or 47 percent of the trips. Five percent is distributed to the west over Ocean Boulevard, 23.5 percent is distributed to

the north on various roadways (Magnolia Avenue, Pacific Avenue, Pine Avenue, Long Beach Boulevard, Atlantic Avenue and Alamitos Avenue), and 26.5 percent is distributed to the east via various roadways including Ocean Avenue, Broadway, 4th Street and 7th Street. For the zones in the eastern portion of Downtown, the freeway percentage is lower, down to 39 percent. The percent taking surface streets to/from the north is higher (30 percent) accounting for the further distance to the freeway (and greater use of arterials rather than the freeway), while the percent to the east is slightly higher at 25 percent.



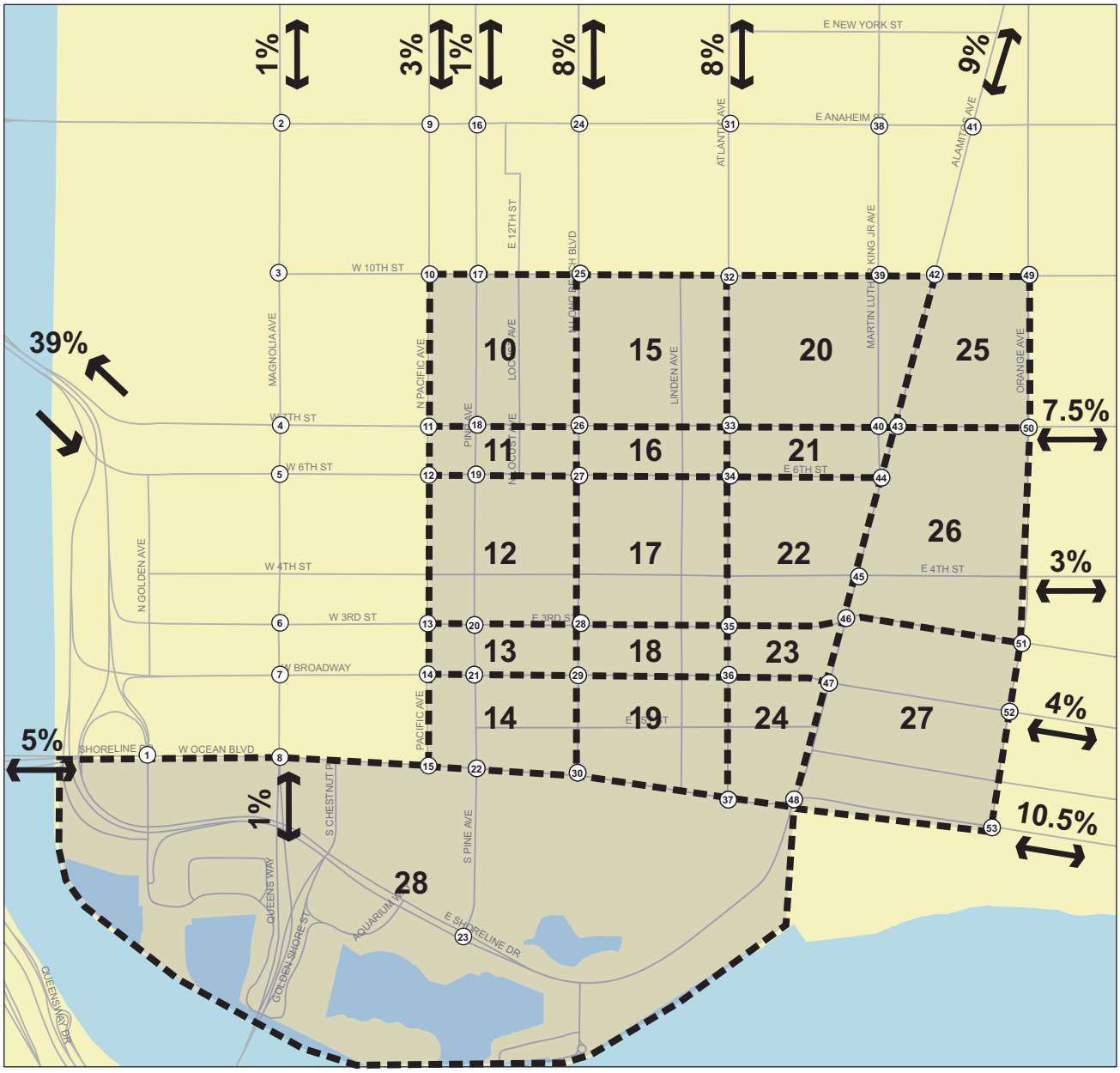
Legend

1	Study Intersection
20%	Percentage Distribution
	Traffic Study Zones

NOT TO SCALE

ITERIS innovation for better mobility

FIGURE 6
Project Distribution (Zones 1-9)
Long Beach Downtown Community Plan



Legend

1	Study Intersection
20%	Percentage Distribution
	Traffic Study Zones

NOT TO SCALE

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FIGURE 7
Project Distribution (Zones 10-28)
Long Beach Downtown Community Plan

5.0 CUMULATIVE PROJECTS (WITHOUT PROJECT SCENARIO)

To evaluate the potential impact of the proposed project on local traffic conditions, it is first necessary to develop a forecast of future traffic volumes in the study area under conditions without the Project (land uses associated with the Downtown Community Plan). This provides a basis against which to measure the Project's traffic impacts. Cumulative Projects are approved, pending and reasonably foreseeable projects in the Downtown area that will generate future daily as well as AM and PM trips impacting the study area.

The City provided a list of pending and approved building areas within the influence area. It was recognized that additional traffic growth occurred from cumulative development projects within and adjacent to the study area including apartments, condominiums, hotels, theatres, shopping centers, clubs, and restaurants. For this analysis, all Cumulative Projects in the Without Project scenario were assumed to be completed prior to build out of the Plan.

5.1 CUMULATIVE PROJECT TRIP GENERATION

Morning and evening peak-hour trip estimates for these Cumulative Projects were developed based on rates published in the Institute of Transportation Engineer's (ITE) publication *Trip Generation, 8th Edition*. Detailed trip generation estimates of the Cumulative Projects with discounts for pass-by, transit and bike/walk are illustrated in **Table 6**.

5.2 CUMULATIVE PROJECT TRIP ASSIGNMENT

Based on the trip distribution methodology described in Section 4.3, the AM and PM peak hour trips generated by the Cumulative Projects were assigned to the area street system. The cumulative project trip assignment is illustrated in **Figures 8A, 8B and 8C**.

Table 6 - Trip Generation of Cumulative Projects (Without Project Scenario)

Land Use Zones	Pending/Approved Projects: Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)	Notes	Land Use Types	ITE Rate Type & In/Out Percentages: ITE Rate Code	AM In	AM Out	PM In	PM Out	AM Rate In	AM Rate Out	PM Rate In	PM Rate Out	ITE Trip Generation Rate/Development Generated Trips: AM Total Rate: Residential Condos	Office	Retail	Restaurant	Hotel		Total AM Trips	PM Total Rate: Residential Condos	Office	Retail	Restaurant	Hotel		Total PM Trips	Reduction for Pass-By Trips (%): Retail - PM	Restaurant - AM	Restaurant - PM	Reduction for Transit Trips (%): Residential	Office	Reduction for Bike, Walk, Mixed Use (%): Restaurant - PM	Total Trips: AM: Total Trips	AM Ins	AM Outs	PM: Total Trips	PM Ins	PM Outs	Daily: Total Trips
Cumulative Projects (without Project Scenario)																																											
3	291					Superior Court Phase 1, Lyon Apartments (under contruction)	Residential Condos	230	17%	83%	67%	33%	0.07	0.35	0.00	0.00	0.42						121	0.50						144				26%			90	15	75	107	72	35	1,629
		535.00					Office	710	88%	12%	17%	83%	1.18	0.16	0.22	1.05		1.34					718		1.27					678					26%		531	467	64	502	85	416	2,767
			8.00				Shopping Center	820	61%	39%	49%	51%	2.65	1.69	7.17	7.47			4.34				35			14.64				117	50%						35	21	14	59	29	30	1,315
				2.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			23				11.15			22		20%	20%			10%	18	9	9	16	9	7	254
																																					673	**513**	**160**	**683**	**195**	**488**	**5,965**
12	624					PT Lofts, 4th St/Long Beach Boulevard	Residential Condos	230	17%	83%	67%	33%	0.06	0.30	0.00	0.00	0.36						223	0.43						270				26%			165	28	137	200	134	66	3,164
			16.74				Shopping Center	820	61%	39%	49%	51%	1.96	1.25	5.62	5.85			3.21				54			11.48				192	50%						54	33	21	96	47	49	2,125
				4.18			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			48				11.15			47		20%	20%			10%	39	20	19	33	19	14	532
																																					258	**81**	**177**	**329**	**200**	**128**	**5,821**
13	166					Promenade Condos, Long Beach Promenade	Residential Condos	230	17%	83%	67%	33%	0.08	0.39	0.00	0.00	0.47						77	0.55						91				26%			57	10	48	67	45	22	1,000
			14.90				Shopping Center	820	61%	39%	49%	51%	2.05	1.31	5.84	6.08			3.36				50			11.92				178	50%						50	31	20	89	44	45	1,970
				3.72			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			43				11.15			42		20%	20%			10%	34	18	16	29	17	12	474
																																					141	**58**	**83**	**185**	**106**	**79**	**3,444**
14	96					Aloft and Long Beach Promenade	Residential Condos	230	17%	83%	67%	33%	0.09	0.43	0.00	0.00	0.52						50	0.61						58				26%			37	6	31	43	29	14	621
			3.70				Shopping Center	820	61%	39%	49%	51%	3.63	2.32	9.26	9.63			5.95				22			18.89				70	50%						22	13	9	35	17	18	796
				0.92			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			11				11.15			10		25%	43%			10%	8	4	4	5	3	2	117
					191		Hotel	310	61%	39%	53%	47%	0.29	0.19	0.31	0.28					0.48		91					0.59		113							91	48	43	113	60	53	2,083
																																					158	**72**	**86**	**196**	**109**	**87**	**3,617**
24	324					Shoreline Gateway	Residential Condos	230	17%	83%	67%	33%	0.07	0.34	0.00	0.00	0.41						132	0.49						158				26%			98	17	81	117	78	38	1,789
			10.10				Shopping Center	820	61%	39%	49%	51%	2.41	1.54	6.64	6.91			3.94				40			13.56				137	50%						40	24	16	68	34	35	1,530
				2.53			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			29				11.15			28		20%	20%			10%	23	12	11	20	12	8	321
																																					161	**53**	**108**	**205**	**123**	**82**	**3,640**
28	1,586					Golden Shore, Ocean Aire, Aloft, Hotel Sierra, Inn at Pike	Residential Condos	230	17%	83%	67%	33%	0.05	0.25	0.00	0.00	0.30						471	0.37						580				26%			349	59	289	429	287	142	7,122
		340.00					Office	710	88%	12%	17%	83%	1.29	0.18	0.23	1.12		1.47					499		1.35					460					26%		369	325	44	340	58	282	1,865
			37.42				Shopping Center	820	61%	39%	49%	51%	1.41	0.90	4.31	4.49			2.30				86			8.80				329	50%						86	53	34	165	81	84	3,585
				9.36			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			108				11.15			104		20%	20%			10%	86	45	41	73	43	30	1,190
					265		Hotel	310	61%	39%	53%	47%	0.32	0.20	0.31	0.28					0.52		137					0.59		156							137	73	64	156	83	73	2,745
																																					1,027	**554**	**473**	**1,163**	**552**	**611**	**16,507**
Subtotal	3,087	875.00	90.85	22.71	456																		3,069							3,983							2,419	1,331	1,087	2,761	1,285	1,476	38,994

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.

Reduction for Pass-By are based on the *Shoreline Gateway EIR Traffic Study*.

Reduction for Transit Trips were based on 2000 US Census Journey to Work and analysis of other local data

Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density .

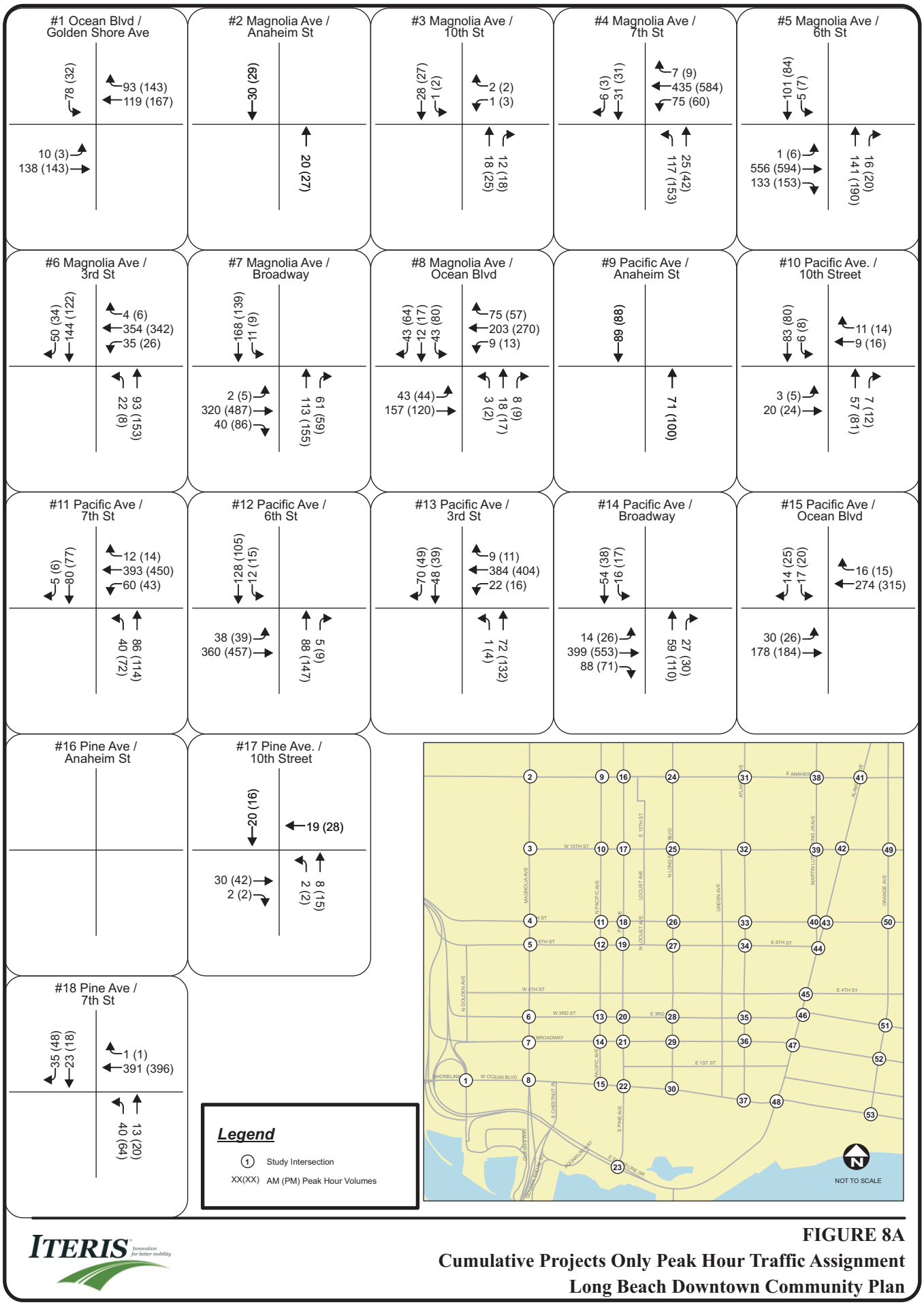

FIGURE 8A
Cumulative Projects Only Peak Hour Traffic Assignment
Long Beach Downtown Community Plan

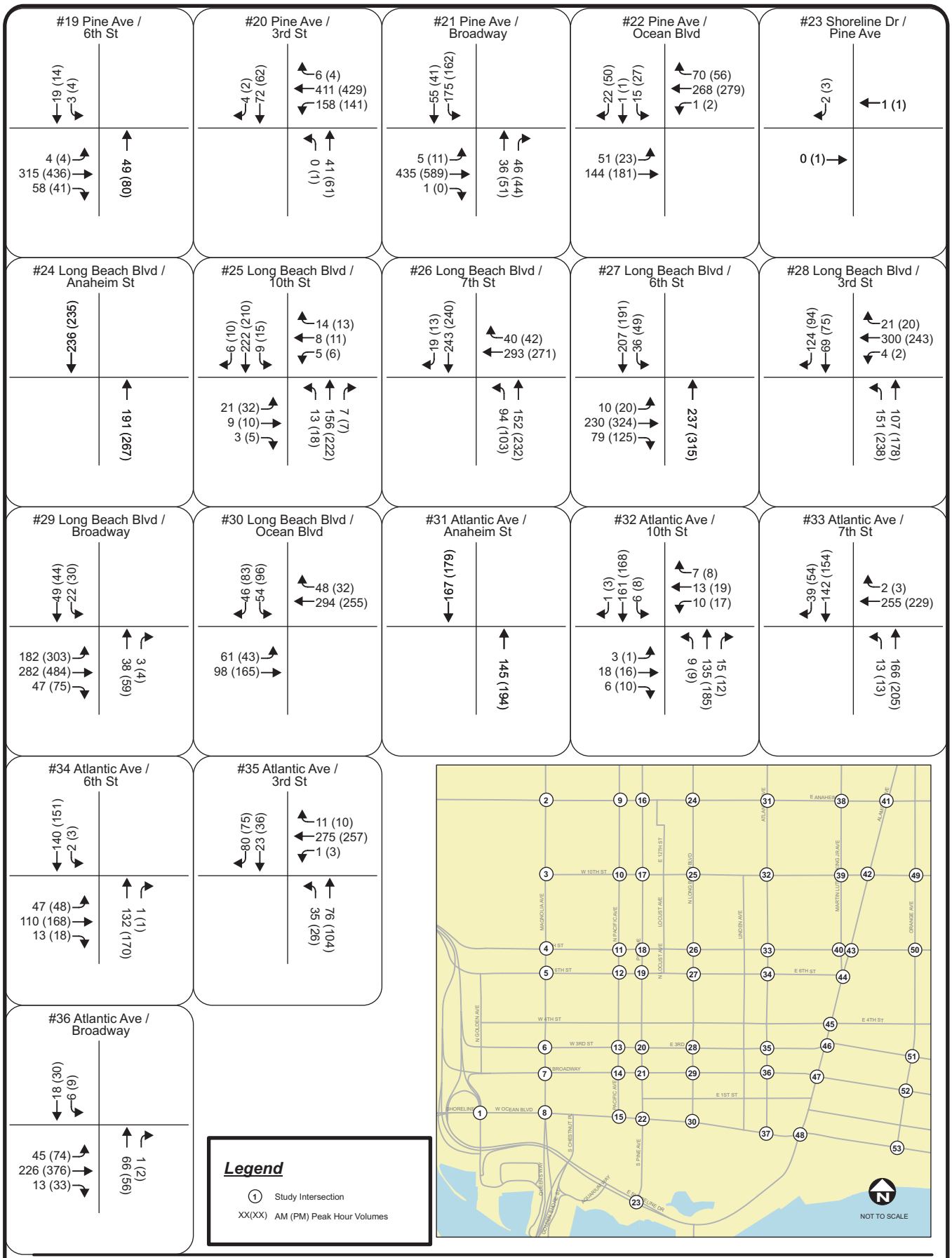

FIGURE 8B
Cumulative Projects Only Peak Hour Traffic Assignment
Long Beach Downtown Community Plan

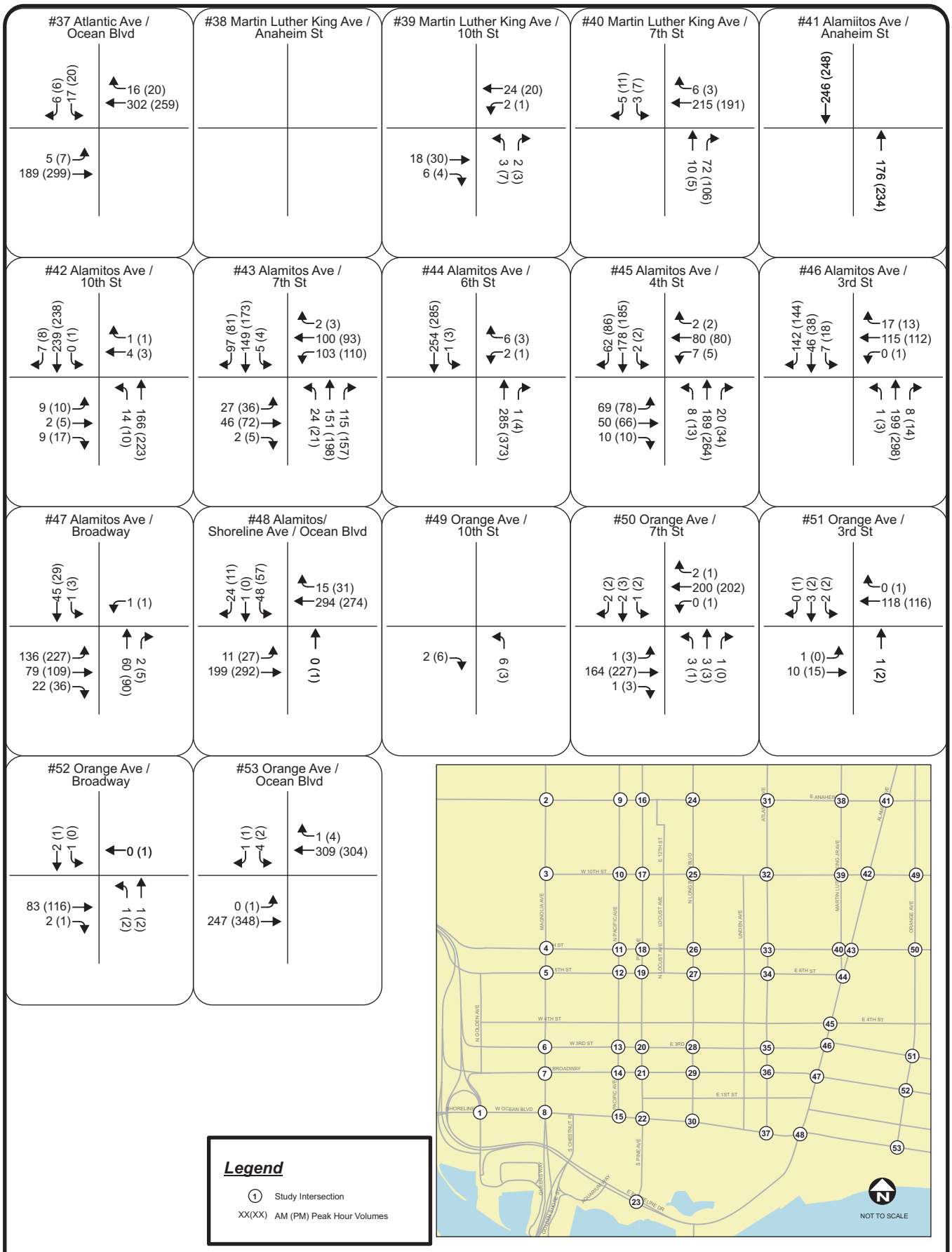

FIGURE 8C
Cumulative Projects Only Peak Hour Traffic Assignment
Long Beach Downtown Community Plan

5.3 YEAR 2035 WITHOUT-PROJECT TRAFFIC OPERATIONS

The projection of Without-Project traffic consists of existing traffic plus traffic generated by the Cumulative Projects, all of which were assumed to be completed by the year 2035. The total Without-Project traffic volumes are illustrated in **Figures 9A**, **9B** and **9C**. Based on these traffic forecasts, 11 intersections are projected to be operating at LOS E or LOS F (4 are currently operating at LOS E or F). The 11 intersections are:

- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and Broadway – LOS E (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)
- Martin Luther King Avenue and 7th Street – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM Peak Hour) and LOS E (PM Peak hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

All other intersections are anticipated to be operating and LOS D or better during the AM and PM peak hours. **Table 7** summarizes the capacity analysis results.

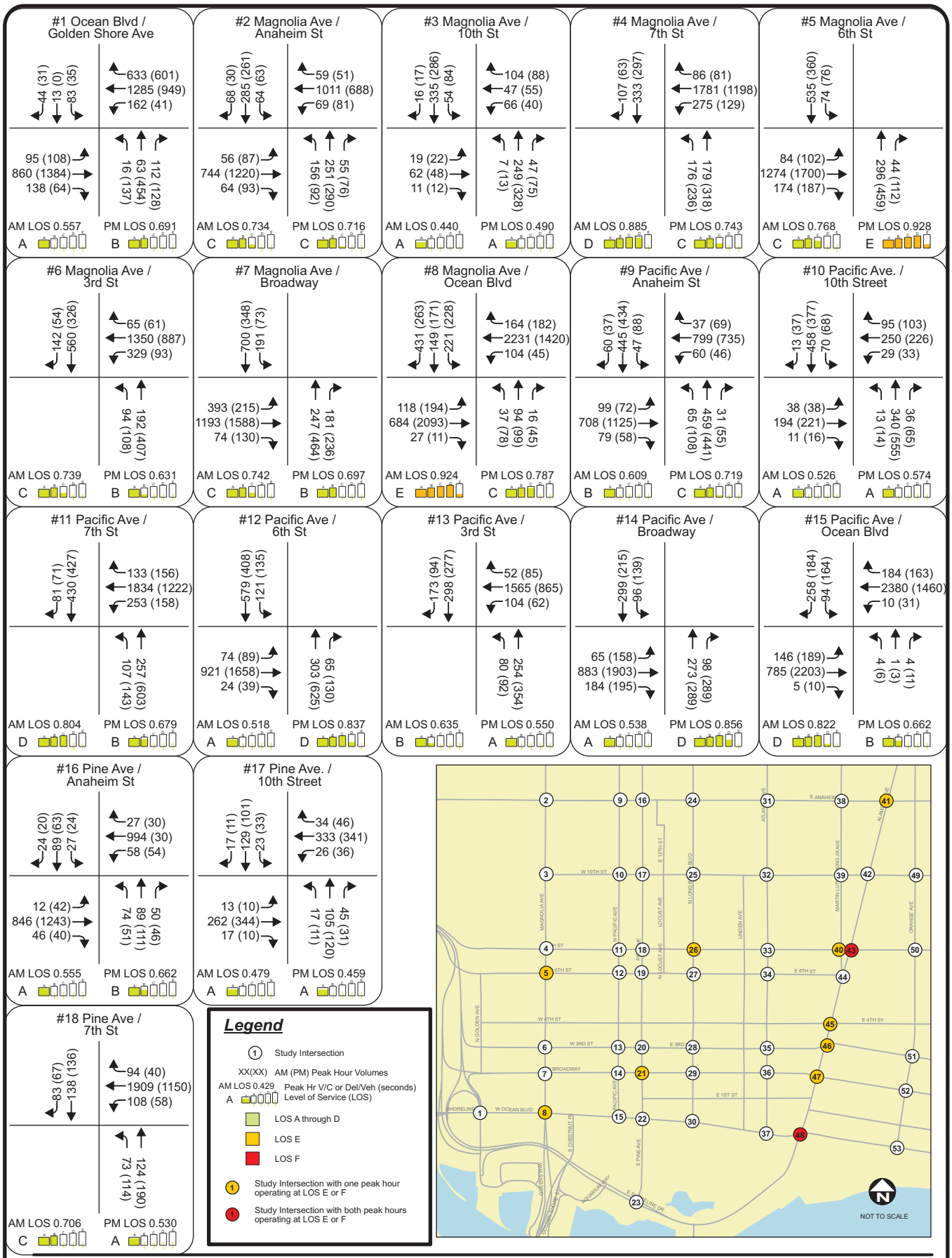

FIGURE 9A

Future Without Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

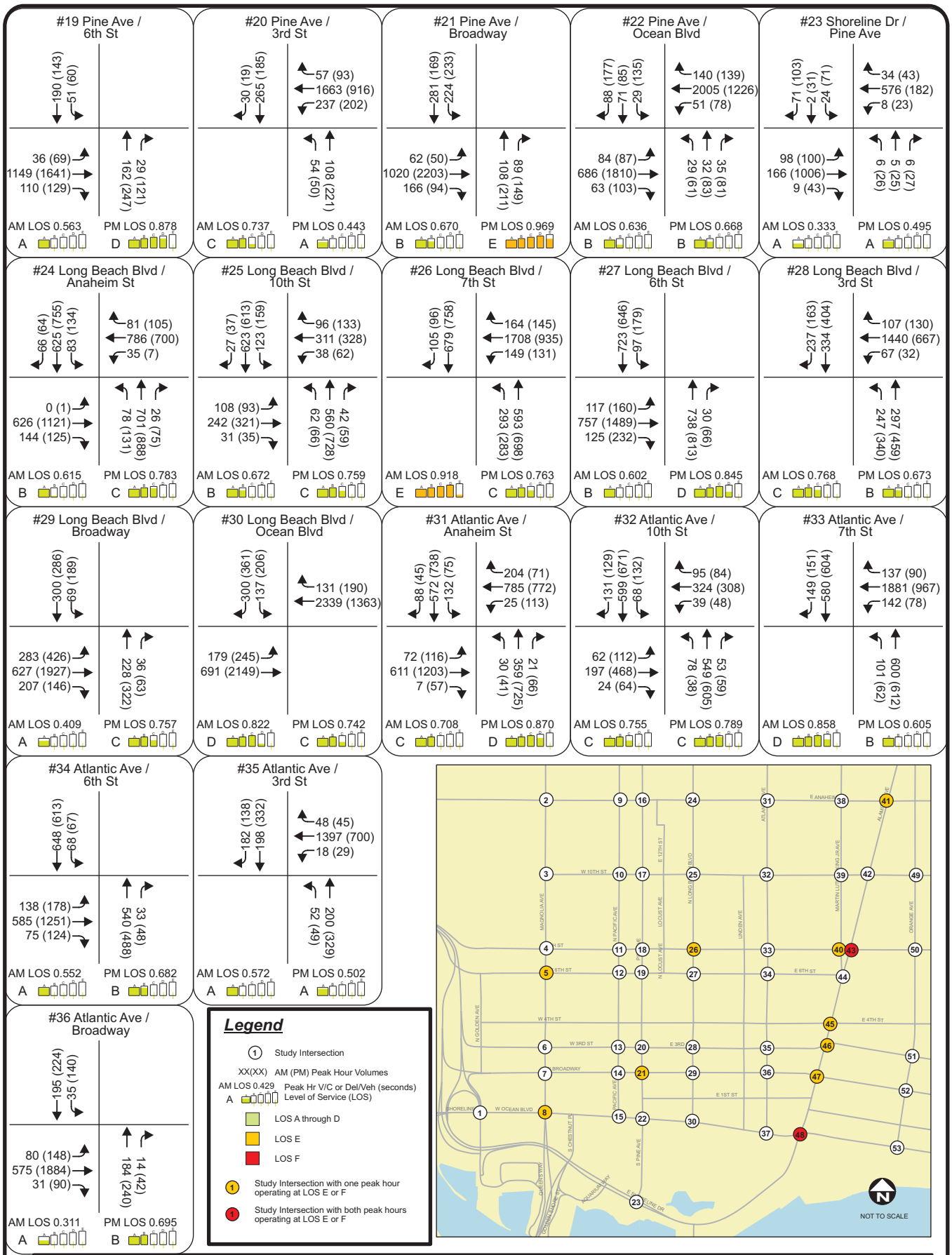

FIGURE 9B

Future Without Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

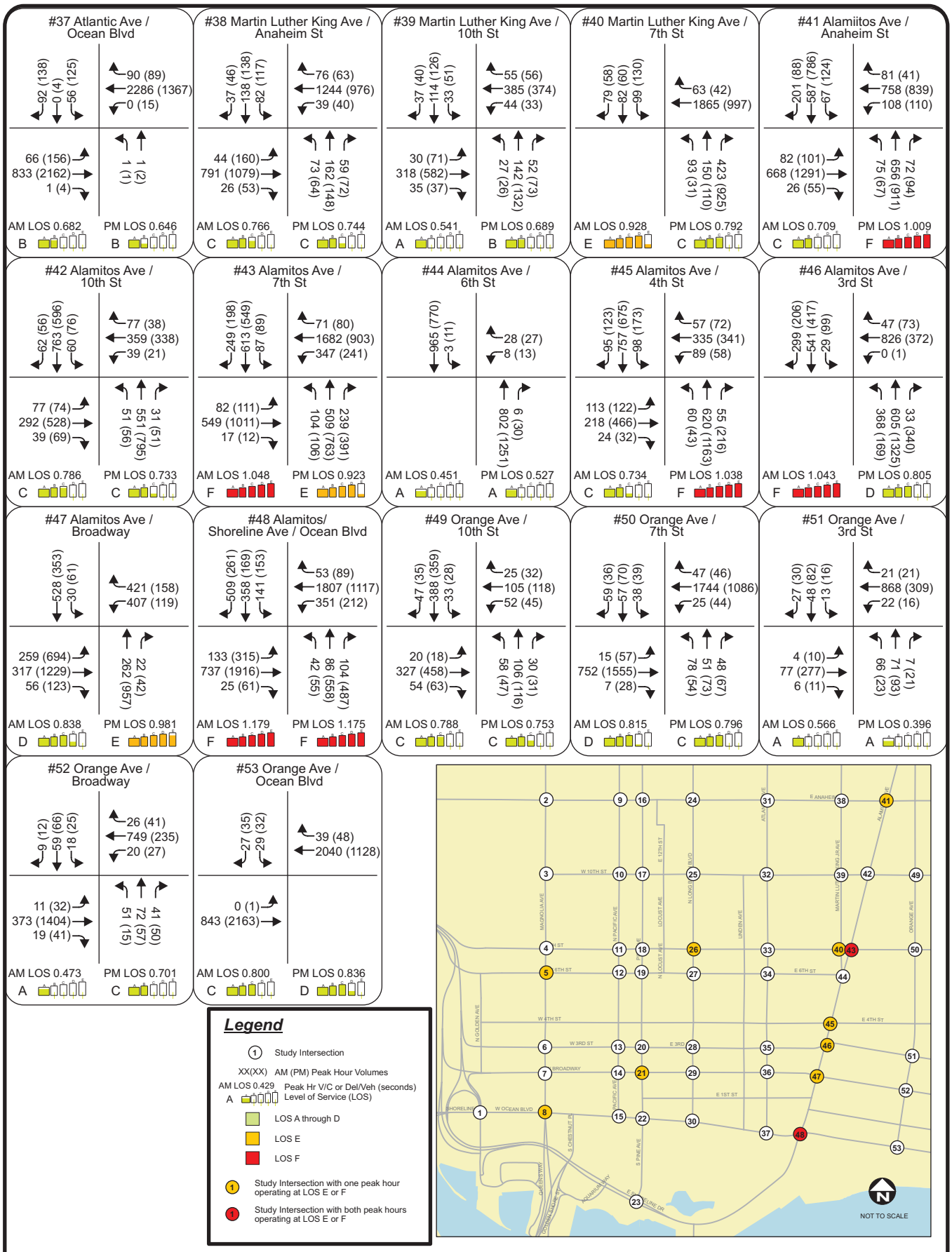

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FIGURE 9C

Future Without Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

TABLE 7: FUTURE WITHOUT PROJECT LEVEL OF SERVICE

	Intersection	Future Without Project			
		AM		PM	
		LOS	V/C	LOS	V/C
1	Ocean Blvd / Golden Shore Ave	A	0.56	B	0.69
2	Magnolia Ave / Anaheim St	C	0.73	C	0.72
3	Magnolia Ave / 10th St	A	0.44	A	0.49
4	Magnolia Ave / 7th St	D	0.89	C	0.74
5	Magnolia Ave / 6th St	C	0.77	E	0.93
6	Magnolia Ave / 3rd St	C	0.74	B	0.63
7	Magnolia Ave / Broadway	C	0.74	B	0.70
8	Magnolia Ave / Ocean Blvd	E	0.92	C	0.79
9	Pacific Ave / Anaheim St	B	0.61	C	0.72
10	Pacific Ave. / 10th Street	A	0.53	A	0.57
11	Pacific Ave / 7th St	D	0.80	B	0.68
12	Pacific Ave / 6th St	A	0.52	D	0.84
13	Pacific Ave / 3rd St	B	0.64	A	0.55
14	Pacific Ave / Broadway	A	0.54	D	0.86
15	Pacific Ave / Ocean Blvd	D	0.82	B	0.66
16	Pine Ave / Anaheim St	A	0.56	B	0.66
17	Pine Ave. / 10th Street	A	0.48	A	0.46
18	Pine Ave / 7th St	C	0.71	A	0.53
19	Pine Ave / 6th St	A	0.56	D	0.88
20	Pine Ave / 3rd St	C	0.74	A	0.44
21	Pine Ave / Broadway	B	0.67	E	0.97
22	Pine Ave / Ocean Blvd	B	0.64	B	0.67
23	Shoreline Dr / Pine Ave	A	0.33	A	0.50
24	Long Beach Blvd / Anaheim St	B	0.62	C	0.78
25	Long Beach Blvd / 10th St	B	0.67	C	0.76
26	Long Beach Blvd / 7th St	E	0.92	C	0.76
27	Long Beach Blvd / 6th St	B	0.60	D	0.85
28	Long Beach Blvd / 3rd St	C	0.77	B	0.67
29	Long Beach Blvd / Broadway	A	0.41	C	0.76
30	Long Beach Blvd / Ocean Blvd	D	0.82	C	0.74
31	Atlantic Ave / Anaheim St	C	0.71	D	0.87
32	Atlantic Ave / 10th St	C	0.76	C	0.79
33	Atlantic Ave / 7th St	D	0.86	B	0.61
34	Atlantic Ave / 6th St	A	0.55	B	0.68
35	Atlantic Ave / 3rd St	A	0.57	A	0.50
36	Atlantic Ave / Broadway	A	0.31	B	0.70
37	Atlantic Ave / Ocean Blvd	B	0.68	B	0.65
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74
39	Martin Luther King Ave / 10th	A	0.54	B	0.69
40	Martin Luther King Ave / 7th S	E	0.93	C	0.79
41	Alamiitos Ave / Anaheim St	C	0.71	F	1.01
42	Alamitos Ave / 10th St	C	0.79	C	0.73
43	Alamitos Ave / 7th St	F	1.05	E	0.92
44	Alamitos Ave / 6th St	A	0.45	A	0.53
45	Alamitos Ave / 4th St	C	0.73	F	1.04
46	Alamitos Ave / 3rd St (*)	D	0.88	F	1.26
47	Alamitos Ave / Broadway	D	0.84	E	0.98
48	Alamitos/Shoreline Ave / Ocean	F	1.18	F	1.18
49	Orange Ave / 10th St	C	0.79	C	0.75
50	Orange Ave / 7th St	D	0.82	C	0.80
51	Orange Ave / 3rd St	A	0.57	A	0.40
52	Orange Ave / Broadway	A	0.47	C	0.70
53	Orange Ave / Ocean Blvd	C	0.80	D	0.84

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
using SYNCHRO 6 software because of
the unique signal phase at this

6.0 DOWNTOWN COMMUNITY PLAN DESCRIPTION

The Downtown Community Plan applies to the area shown in **Figure 3**. This area represents the heart of Long Beach and is approximately 631 acres in size, generally lying between Golden Avenue to the west, Alamitos Avenue to the east, 10th Street to the north, and Ocean Boulevard to the south. The Plan incorporates zoning, development standards, and design guidelines to establish design and development criteria in order to guide new development in a way that is consistent with the vision for the Downtown. The Downtown Community Plan area is well connected to the region and is located in the southwestern portion of Long Beach, within Los Angeles County, approximately 20 miles south of Los Angeles. The land uses under this scenario are in addition to the Cumulative Projects included in the Without Project scenario.

6.1 PROJECT TRAFFIC GENERATION

Similar to the Cumulative Projects in the previous chapter, the *ITE Trip Generation*, 8th Edition rates were used to estimate future trips associated with the Downtown Community Plan. For this analysis, it was assumed that all of the Community Plan growth would be completed by the year 2035. Therefore no phasing analysis was completed. Detailed trip generation of the community plan with discounts for pass-by, transit and bike/walk are illustrated in **Table 8**. The Downtown Community Plan is expected to generate approximately 5,338 new trips in the AM peak hour and 6,273 new trips in the PM peak hour. These trips represent the number of additional trips that will be generated in addition to the trips associated with the Without Project conditions.

6.2 WITH PROJECT TRIP ASSIGNMENT

Based on the trip distribution methodology described in Section 4.3, the AM and PM peak hour trips generated by the Downtown Community Plan were assigned to the area street system. The Community Plan project trip assignment is illustrated in **Figures 10A, 10B and 10C**.

Table 8 - Trip Generation of Downtown Community Plan (With Project Scenario)
Long Beach Downtown Community Plan - Downtown Community Plan (with Project Scenario)

Land Use Zones	Downtown Community Plan						Land Use Types	ITE Rate Code	ITE Rate Type & In/Out Percentages								ITE Trip Generation Rate/Development Generated Trips														Reduction for Pass-By Trips (%)			Reduction for Transit Trips (%)		Reduction for Bike, Walk, Mixed Use (%)	Total Trips						
									AM		PM		AM		PM		AM Total Rate						Total AM Trips	PM Total Rate						Total PM Trips						AM			PM			Daily
	Residential (DUs)	Office (KSF)	Shopping Center (KSF)	Restaurant (KSF)	Hotel (Rooms)				In	Out	In	Out	Rate In	Rate Out	Rate In	Rate Out	Residential Condos	Office	Retail	Restaurant	Hotel			Residential Condos	Office	Retail	Restaurant	Hotel			Retail - PM	Restaurant - AM	Restaurant - PM	Residential	Office	Restaurant - PM	Total Trips	Ins	Outs	Total Trips	Ins	Outs	Total Trips
Downtown Community Plan (with Project Scenario)																																										
2	40						Residential Condos	230	17%	83%	67%	33%	0.11	0.51	0.00	0.00	0.62						25	0.71						28				26%			**18**	**3**	**15**	**21**	**14**	**7**	**290**
3		150.00					Office	710	88%	12%	17%	83%	1.52	0.21	0.28	1.37		1.73					259		1.65					247					26%		192	169	23	183	31	152	915
			4.00				Shopping Center	820	61%	39%	49%	51%	3.52	2.25	9.02	9.39			5.76				23			18.40				74	50%						23	14	9	37	18	19	838
				1.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			12				11.15			11		20%	20%			10%	9	5	4	8	5	3	127
																																					224	**188**	**36**	**227**	**54**	**174**	**1,880**
4	500						Residential Condos	230	17%	83%	67%	33%	0.06	0.31	0.00	0.00	0.37						187	0.45						225				26%			138	24	115	166	112	55	2,609
		250.00					Office	710	88%	12%	17%	83%	1.37	0.19	0.24	1.19		1.56					390		1.44					359					26%		289	254	35	266	45	220	1,427
			12.00				Shopping Center	820	61%	39%	49%	51%	2.24	1.43	6.28	6.53			3.67				44			12.81				154	50%						44	27	17	77	38	39	1,712
				3.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			35				11.15			33		20%	20%			10%	28	15	13	23	14	9	381
					60		Hotel	310	61%	39%	53%	47%	0.22	0.14	0.31	0.28					0.36		22					0.59		35							22	11	10	35	19	17	910
																																					521	**331**	**190**	**567**	**227**	**341**	**7,039**
5	80						Residential Condos	230	17%	83%	67%	33%	0.09	0.45	0.00	0.00	0.54						43	0.63						50				26%			32	5	27	37	25	12	530
6	20						Residential Condos	230	17%	83%	67%	33%	0.12	0.59	0.00	0.00	0.71						14	0.80						16				26%			11	2	9	12	8	4	159
7	280						Residential Condos	230	17%	83%	67%	33%	0.07	0.35	0.00	0.00	0.42						118	0.50						140				26%			87	15	72	103	69	34	1,575
			48.00				Shopping Center	820	61%	39%	49%	51%	1.27	0.81	3.97	4.13			2.08				100			8.11				389	50%						100	61	39	195	95	99	4,214
				12.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			138				11.15			134		20%	20%			10%	111	58	53	94	55	39	1,526
																																					298	**133**	**165**	**392**	**220**	**172**	**7,315**
8	320						Residential Condos	230	17%	83%	67%	33%	0.07	0.34	0.00	0.00	0.41						131	0.49						156				26%			97	16	80	115	77	38	1,769
9	800						Residential Condos	230	17%	83%	67%	33%	0.06	0.28	0.00	0.00	0.34						273	0.41						331				26%			202	34	167	245	164	81	3,927
		460.00					Office	710	88%	12%	17%	83%	1.22	0.17	0.22	1.07		1.38					636		1.29					594					26%		471	414	56	440	75	365	2,426
			64.00				Shopping Center	820	61%	39%	49%	51%	1.13	0.72	3.61	3.76			1.85				118			7.37				472	50%						118	72	46	236	116	120	5,081
				16.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			184				11.15			178		20%	20%			10%	147	76	71	125	74	51	2,034
																																					938	**597**	**341**	**1,045**	**428**	**617**	**13,468**
10	320						Residential Condos	230	17%	83%	67%	33%	0.07	0.34	0.00	0.00	0.41						131	0.49						156				26%			97	16	80	115	77	38	1,769
		55.00					Office	710	88%	12%	17%	83%	1.86	0.25	0.43	2.12		2.11					116		2.55					140					26%		86	76	10	104	18	86	382
																																					183	**92**	**91**	**219**	**95**	**124**	**2,151**
11	280						Residential Condos	230	17%	83%	67%	33%	0.07	0.35	0.00	0.00	0.42						118	0.50						140				26%			87	15	72	103	69	34	1,575
		60.00					Office	710	88%	12%	17%	83%	1.83	0.25	0.41	2.02		2.08					125		2.43					146					26%		92	81	11	108	18	90	412
																																					179	**96**	**83**	**212**	**88**	**124**	**1,987**
12	340						Residential Condos	230	17%	83%	67%	33%	0.07	0.34	0.00	0.00	0.40						137	0.48						164				26%			102	17	84	121	81	40	1,865
		110.00					Office	710	88%	12%	17%	83%	1.62	0.22	0.31	1.52		1.84					202		1.84					202					26%		150	132	18	149	25	124	699
																																					251	**149**	**102**	**271**	**107**	**164**	**2,564**
13	320						Residential Condos	230	17%	83%	67%	33%	0.07	0.34	0.00	0.00	0.41						131	0.49						156				26%			97	16	80	115	77	38	1,769
		175.00					Office	710	88%	12%	17%	83%	1.48	0.20	0.27	1.30		1.68					293		1.57					275					26%		217	191	26	203	35	169	1,047
			100.00				Shopping Center	820	61%	39%	49%	51%	0.94	0.60	3.12	3.24			1.54				154			6.36				636	50%						154	94	60	318	156	162	6,791
				25.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			288				11.15			279		20%	20%			10%	230	120	110	195	115	80	3,179
																																					698	**421**	**277**	**832**	**383**	**449**	**12,786**
14	180						Residential	230	17%	83%	67%	33%	0.08	0.38	0.00	0.00	0.46						83	0.54						97				26%			61	10	51	72	48	24	1,073
		175.00					Office	710	88%	12%	17%	83%	1.48	0.20	0.27	1.30		1.68					293		1.57					275					26%		217	191	26	203	35	169	1,047
																																					278	**202**	**77**	**275**	**83**	**193**	**2,120**
15	120						Residential Condos	230	17%	83%	67%	33%	0.08	0.41	0.00	0.00	0.50						60	0.58						70				26%			**44**	**8**	**37**	**52**	**35**	**17**	**754**
16	20						Residential Condos	230	17%	83%	67%	33%	0.12	0.59	0.00	0.00	0.71						14	0.80						16				26%			**11**	**2**	**9**	**12**	**8**	**4**	**159**
17	280						Residential Condos	230	17%	83%	67%	33%	0.07	0.35	0.00	0.00	0.42						118	0.50						140				26%			87	15	72	103	69	34	1,575
			64.00				Shopping Center	820	61%	39%	49%	51%	1.13	0.72	3.61	3.76			1.85				118			7.37				472	50%						118	72	46	236	116	120	5,081
				16.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			184				11.15			178		20%	20%			10%	147	76	71	125	74	51	2,034
					60		Hotel	310	61%	39%	53%	47%	0.22	0.14	0.31	0.28					0.36		22					0.59		35							22	11	10	35	19	17	910
																																					374	**175**	**199**	**500**	**277**	**222**	**9,600**
18	20						Residential Condos	230	17%	83%	67%	33%	0.12	0.59	0.00	0.00	0.71						14	0.80						16				26%			11	2	9	12	8	4	159
			28.00				Shopping Center	820	61%	39%	49%	51%	1.58	1.01	4.74	4.94			2.60				73			9.68				271	50%						73	44	28	136	66	69	2,969
				7.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			81				11.15			78		20%	20%			10%	65	34	31	55	32	23	890
					120		Hotel	310	61%	39%	53%	47%	0.26	0.17	0.31	0.28					0.43		51					0.59		71							51	27	24	71	38	33	1,447
																																					199	**107**	**92**	**273**	**144**	**129**	**5,465**
19	220						Residential Condos	230	17%	83%	67%	33%	0.07	0.37	0.00	0.00	0.44						97	0.52						115				26%			72	12	60	85	57	28	1,277
			64.00				Shopping Center	820	61%	39%	49%	51%	1.13	0.72	3.61	3.76			1.85				118			7.37				472	50%						118	72	46	236	116	120	5,081
				16.00			Restaurant	932	52%	48%	59%	41%	5.99	5.53	6.58	4.57				11.52			184				11.15			178		25%	43%			10%	138	72	66	84	50	34	2,034
					240		Hotel	310	61%	39%	53%	47%	0.31	0.20	0.31	0.28					0.50		121					0.59		142							121	64	57	142	75	67	2,521
																																					449	**220**	**229**	**546**	**297**	**249**	**10,913**
20	110						Residential Condos	230	17%	83%	67%	33%	0.09	0.42	0.00	0.00	0.51						56	0.59						65				26%			41	7	34	48	32	16	699
		65.00					Office	710	88%	12%	17%	83%	1.80	0.25	0.40	1.94		2.04					133		2.33					152					26%		98	87	12	112	19	93	442
																																					140	**94**	**46**	**160**	**51**	**109**	**1,141**
21	20						Residential Condos	230	17%	83%	67%	33%	0.12	0.59	0.00	0.00	0.71						14	0.80						16				26%			11	2	9	12	8	4	159
22	240						Residential Condos	230	17%	83%	67%	33%	0.07	0.36	0.00	0.00	0.43						104	0.51						123				26%			77	13	64	91	61	30	1,378
					40		Hotel	310	61%	39%	53%	47%	0.20	0.13	0.31	0.28					0.33		13					0.59		24							13	7	6	24	13	11	731
																																					90	**20**	**70**	**115**	**74**	**41**	**2,109**
23	140						Residential Condos	230	17%	83%	67%	33%	0.08	0.40	0.00	0.00	0.48						68	0.57						79				26%			50	9	42	59	39	19	862
					120		Hotel	310	61%	39%	53%	47%	0.26	0.17	0.31	0.28					0.43		51					0.59		71							51	27	24	71	38	33	1,447
																																					101	**36**	**66**	**129**	**77**	**53**	**2,309**
24	180						Residential Condos	230	17%	83%	67%	33%	0.08	0.38	0.00	0.00	0.46						83	0.54						97				26%			61	10	51	72	48	24	1,073
					100		Hotel	310	61%	39%	53%	47%	0.25	0.16	0.31	0.28					0.41		41					0.59		59							41	22	19	59	31	28	1,268
																																					102	**32**	**70**	**131**	**80**	**52**	**2,341**
25	20						Residential Condos	230	17%	83%	67%	33%	0.12	0.59	0.00	0.00	0.71						14	0.80						16				26%			11	2	9	12	8	4	159
					20		Hotel	310	61%	39%	53%	47%	0.17	0.11	0.31	0.28					0.28		6					0.59		12							6	3	3	12	6	6	552
																																					16	**5**	**11**	**24**	**14**	**9**	**711**
26	40						Residential Condos	230	17%	83%	67%	33%	0.11	0.51	0.00	0.00	0.62						25	0.71						28				26%			**18**	**3**	**15**	**21**	**14**	**7**	**290**
27	110						Residential Condos	230	17%	83%	67%	33%	0.09	0.42	0.00	0.00	0.51						56	0.59						65				26%			41	7	34	48	32	16	699
					40		Hotel	310	61%	39%	53%	47%	0.20	0.13	0.31	0.28					0.33		13					0.59		24							13	7	6	24	13	11	731
																																					54	**14**	**40**	**72**	**45**	**27**	**1,430**
Subtotal	5,000	1,500.00	384.00	96.00	800	0																	6,755							9,377							5,338	2,952	2,386	6,273	2,932	3,341	91,439
																						Grand Total	9,824							13,360							7,757	4,284	3,474	9,034	4,217	4,817	130,433

Source - ITE Trip Generation, 8th Edition, 2009. Equation based trips were used where available, otherwise average trip rates were used.

Reduction for Pass-By are based on the *Shoreline Gateway EIR Traffic Study*.

Reduction for Transit Trips were based on 2000 US Census Journey to Work and analysis of other local data

Per the guidance from the City of Long Beach staff, density for restaurant land uses assumed to be 20% of the total retail land use density .

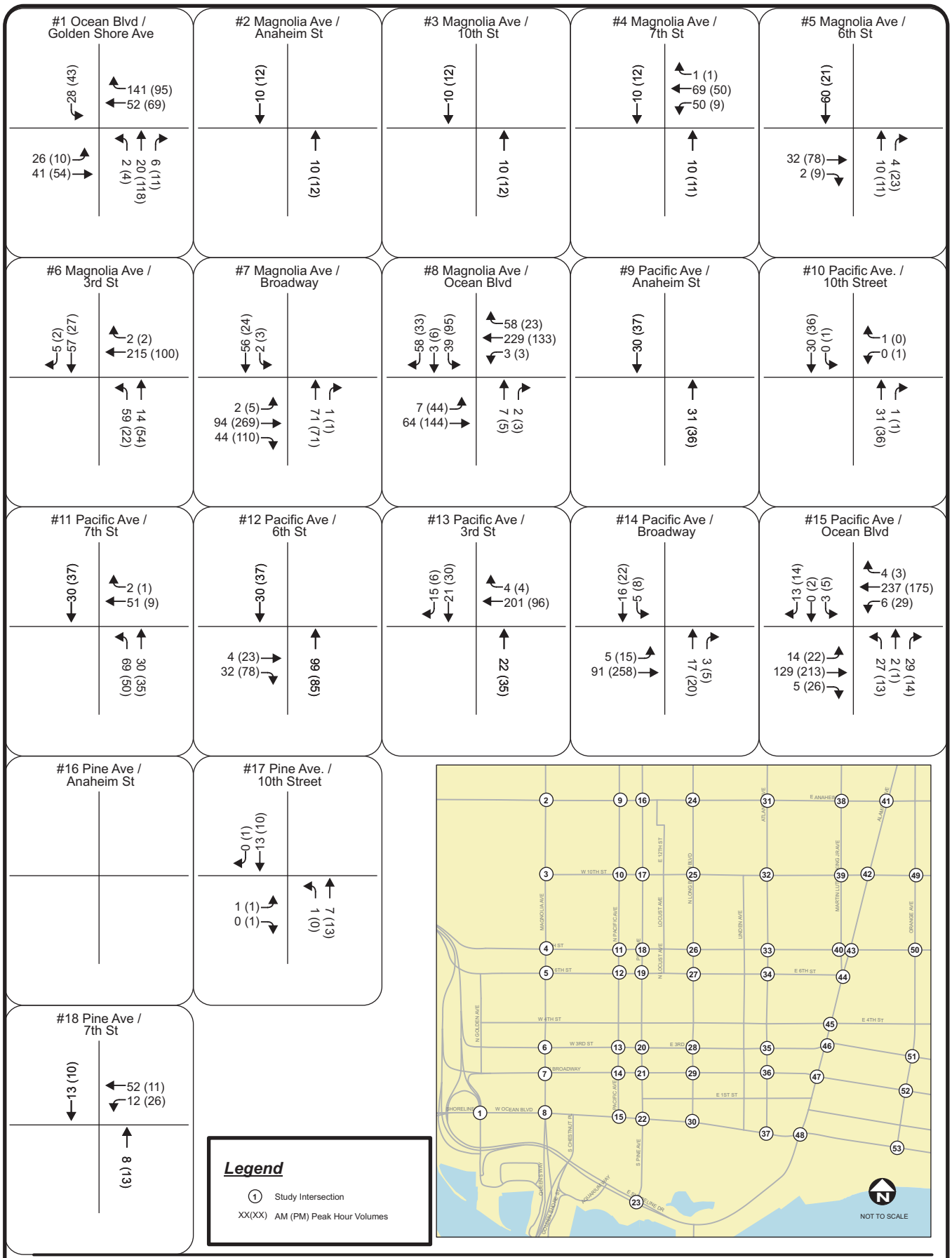


FIGURE 10A

Community Plan Development Peak Hour Traffic Assignment

Long Beach Downtown Community Plan

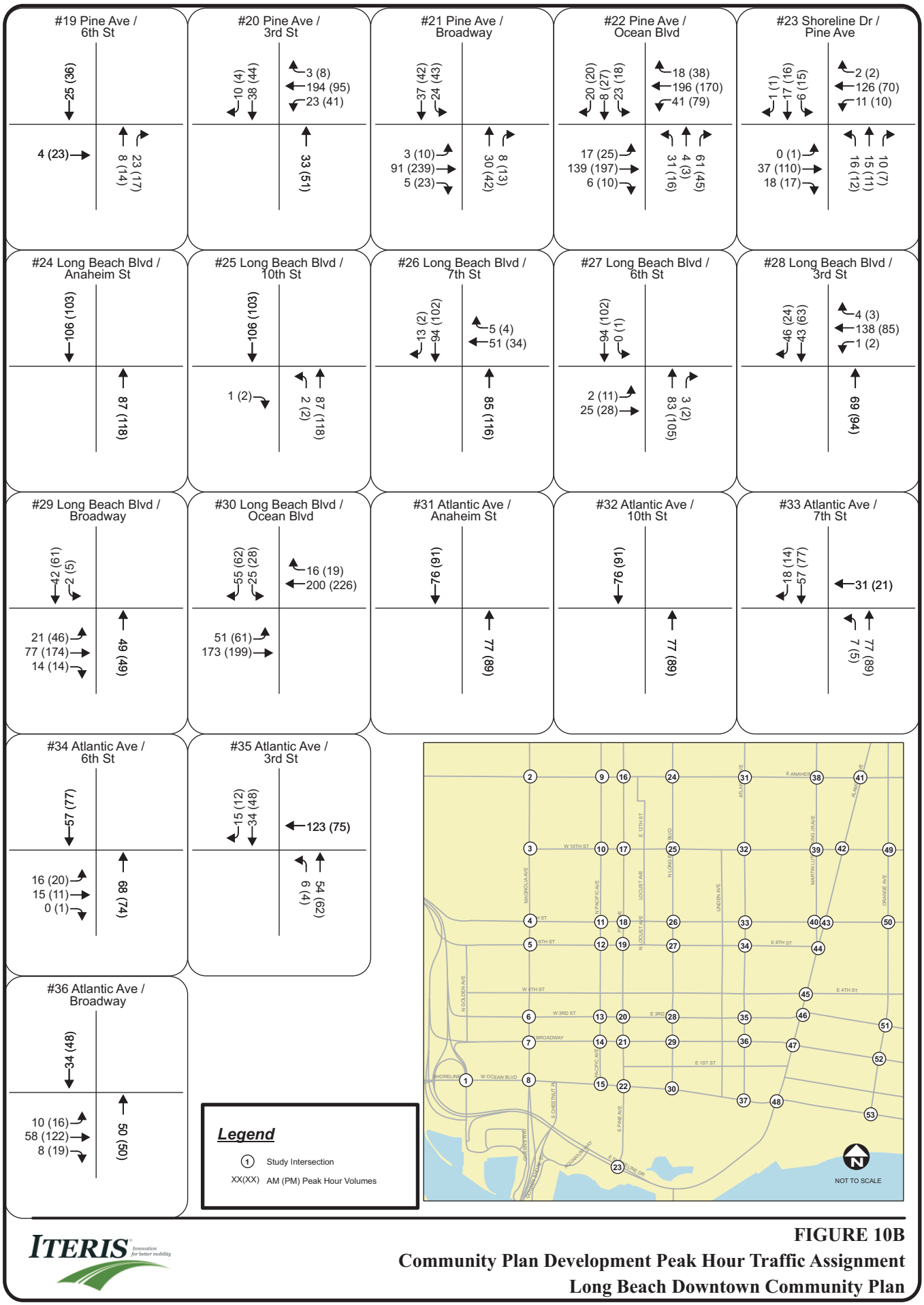


FIGURE 10B
Community Plan Development Peak Hour Traffic Assignment
Long Beach Downtown Community Plan

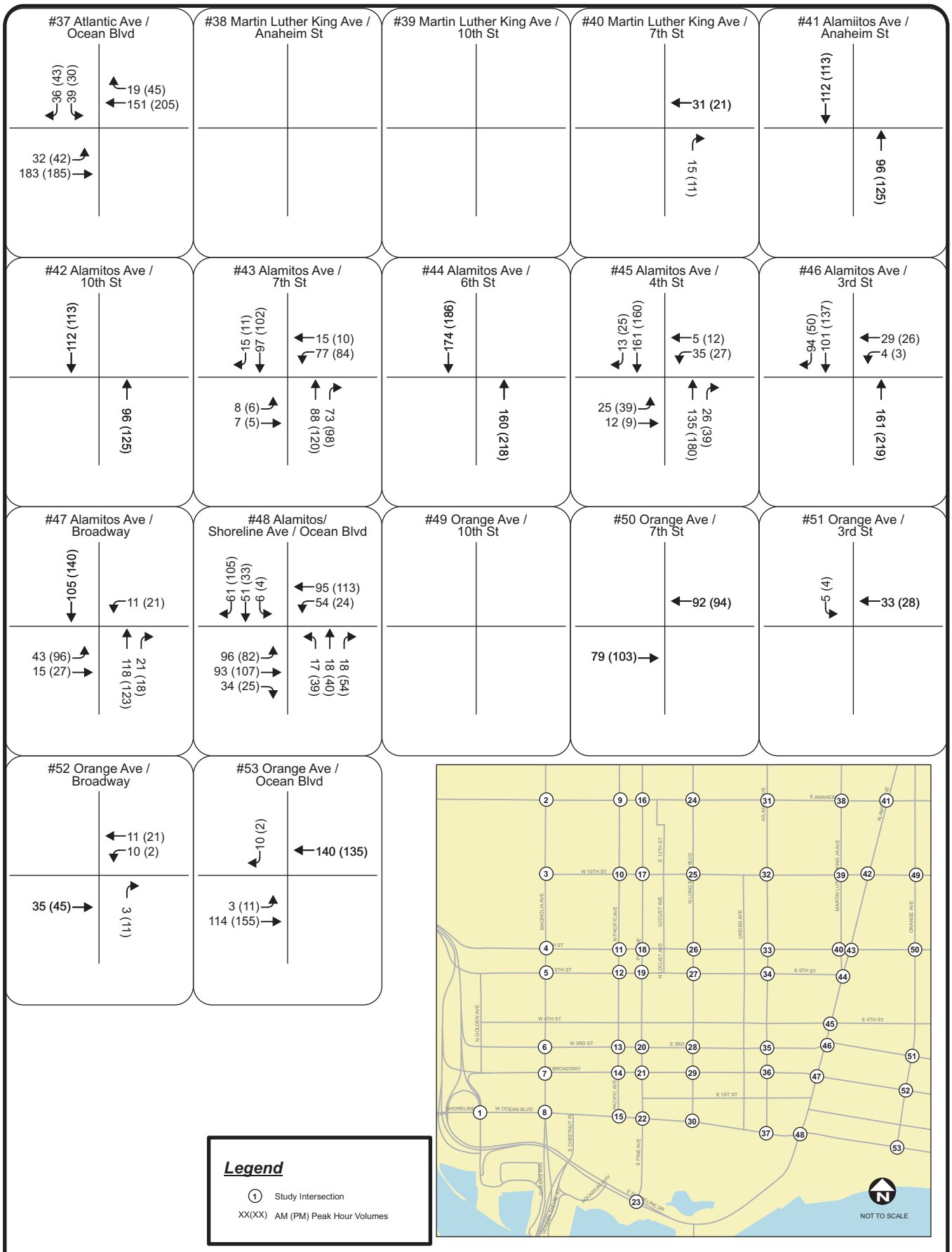


FIGURE 10C
Community Plan Development Peak Hour Traffic Assignment
Long Beach Downtown Community Plan

6.3 YEAR 2035 WITH PROJECT TRAFFIC OPERATIONS

The projection of With Project traffic consists of existing traffic plus traffic generated by the Cumulative Projects plus traffic generated by the Downtown Community Plan land uses, all of which were assumed to be completed by the year 2035. The total year 2035 With Project traffic volumes are illustrated in **Figures 11A**, **11B** and **11C**. Based on these traffic forecasts, 16 intersections are projected to be operating at LOS E or LOS F (11 intersections are anticipated to be operating at LOS E or F in the Without Project scenario). The 16 intersections are:

- Magnolia Avenue and 7th Street – LOS E (AM Peak Hour)
- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS F (AM Peak Hour)
- Pacific Avenue and Broadway – LOS E (PM Peak Hour)
- Pacific Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and 6th Street – LOS E (PM Peak Hour)
- Pine Avenue and Broadway – LOS F (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)
- Long Beach Boulevard and Ocean Boulevard – LOS E (AM Peak Hour)
- Martin Luther King Avenue and 7th Street – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM and PM Peak Hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (AM Peak Hour) and LOS F (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

All other intersections are anticipated to be operating and LOS D or better during the AM and PM peak hours. **Table 9** summarizes the capacity analysis results.

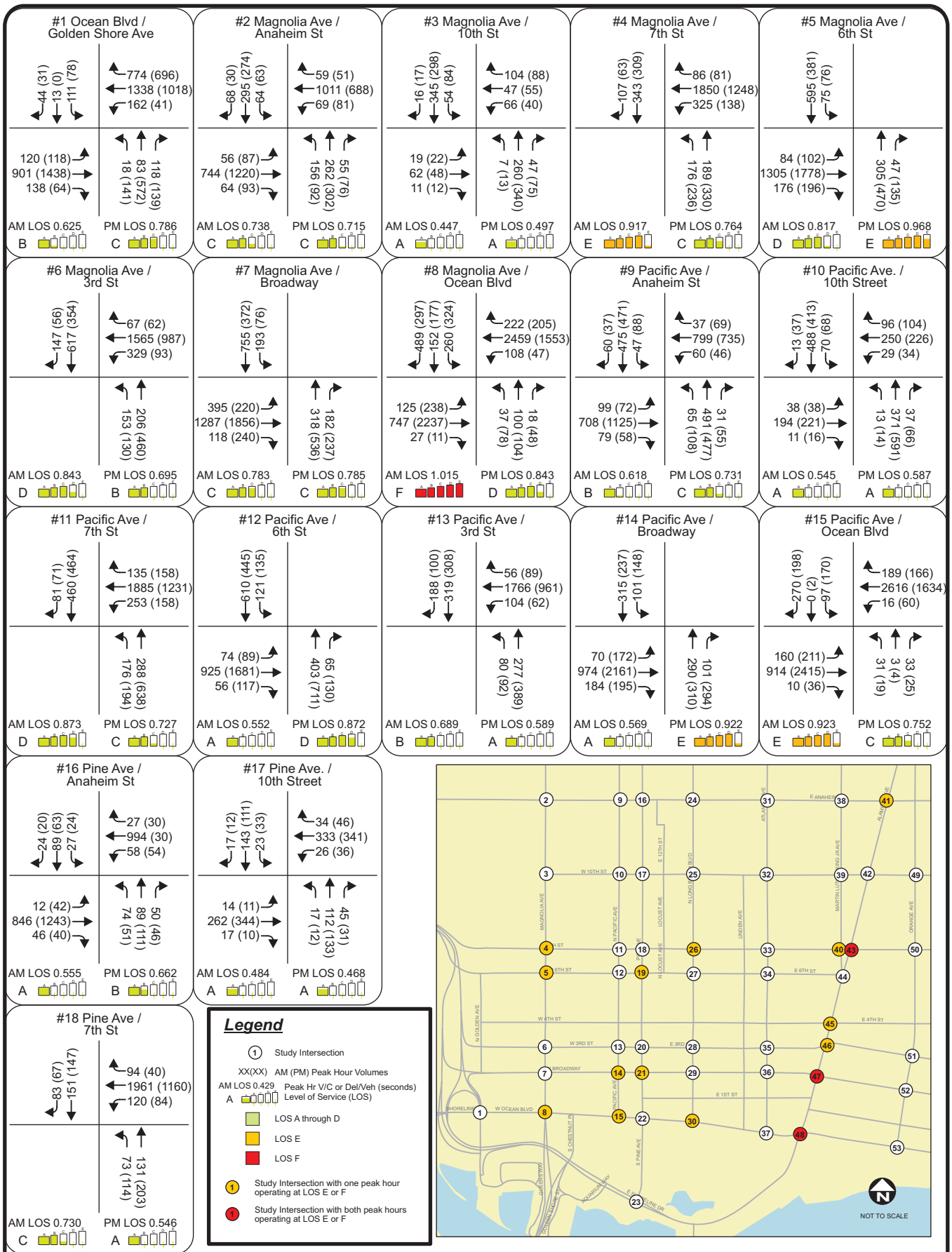
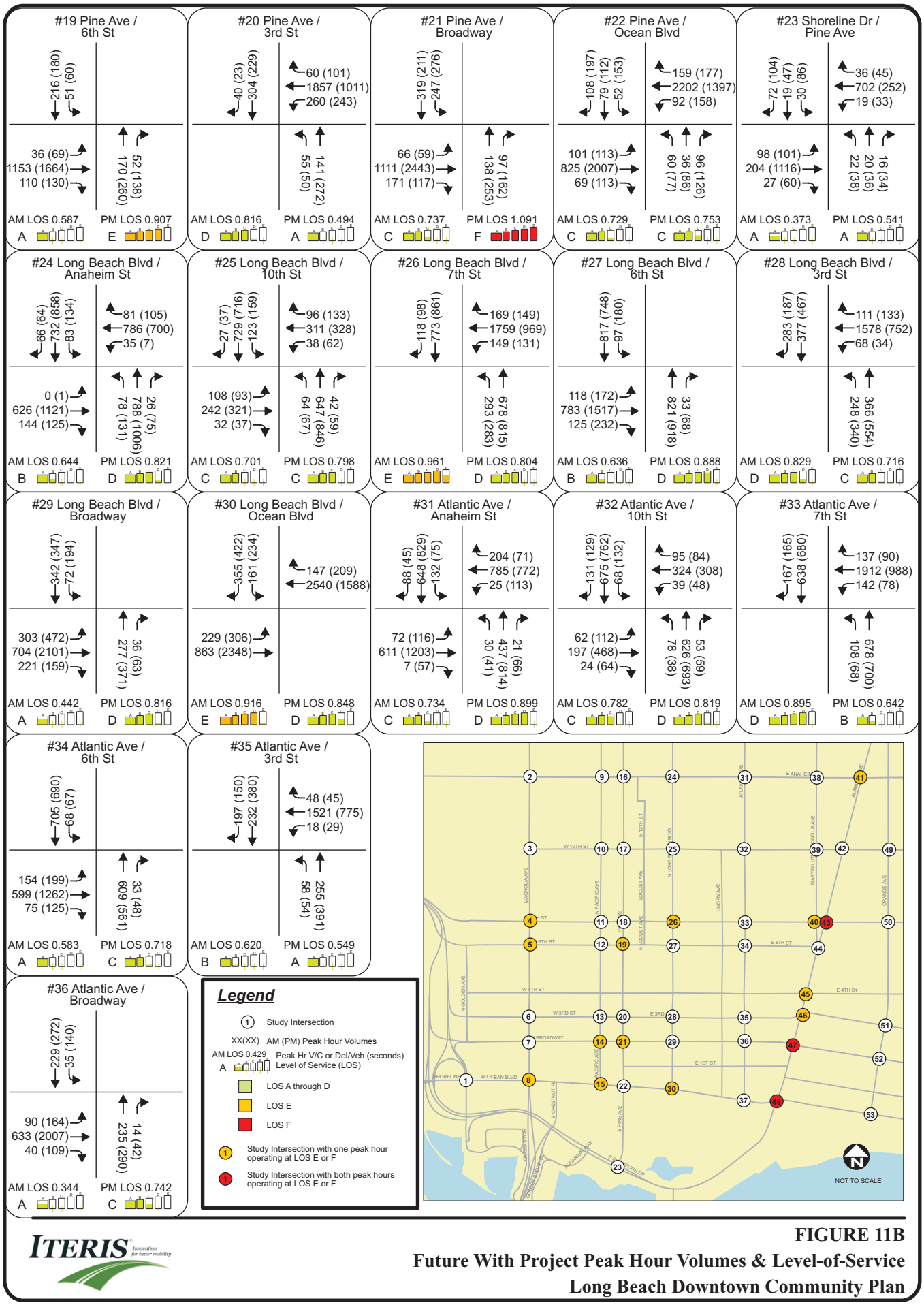


FIGURE 11A

Future With Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan



ITERIS innovation for better mobility

FIGURE 11B

Future With Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

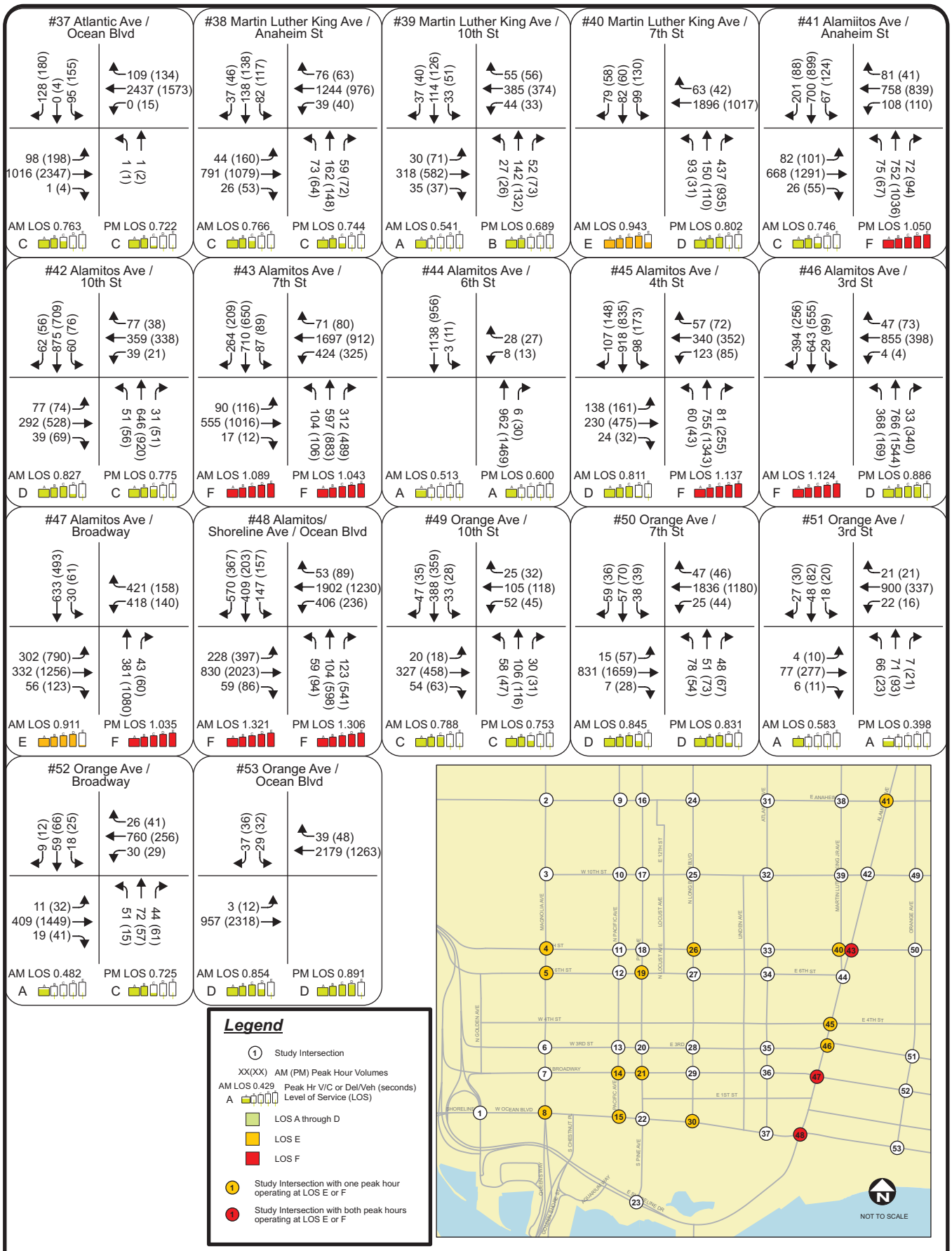


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FIGURE 11C

Future With Project Peak Hour Volumes & Level-of-Service

Long Beach Downtown Community Plan

TABLE 9: FUTURE WITH PROJECT LEVEL OF SERVICE

	Intersection	Future With Project			
		AM		PM	
		LOS	V/C	LOS	V/C
1	Ocean Blvd / Golden Shore Ave	B	0.63	C	0.79
2	Magnolia Ave / Anaheim St	C	0.74	C	0.72
3	Magnolia Ave / 10th St	A	0.45	A	0.50
4	Magnolia Ave / 7th St	E	0.92	C	0.76
5	Magnolia Ave / 6th St	D	0.82	E	0.97
6	Magnolia Ave / 3rd St	D	0.84	B	0.70
7	Magnolia Ave / Broadway	C	0.78	C	0.79
8	Magnolia Ave / Ocean Blvd	F	1.02	D	0.84
9	Pacific Ave / Anaheim St	B	0.62	C	0.73
10	Pacific Ave. / 10th Street	A	0.55	A	0.59
11	Pacific Ave / 7th St	D	0.87	C	0.73
12	Pacific Ave / 6th St	A	0.55	D	0.87
13	Pacific Ave / 3rd St	B	0.69	A	0.59
14	Pacific Ave / Broadway	A	0.57	E	0.92
15	Pacific Ave / Ocean Blvd	E	0.92	C	0.75
16	Pine Ave / Anaheim St	A	0.56	B	0.66
17	Pine Ave. / 10th Street	A	0.48	A	0.47
18	Pine Ave / 7th St	C	0.73	A	0.55
19	Pine Ave / 6th St	A	0.59	E	0.91
20	Pine Ave / 3rd St	D	0.82	A	0.49
21	Pine Ave / Broadway	C	0.74	F	1.09
22	Pine Ave / Ocean Blvd	C	0.73	C	0.75
23	Shoreline Dr / Pine Ave	A	0.37	A	0.54
24	Long Beach Blvd / Anaheim St	B	0.64	D	0.82
25	Long Beach Blvd / 10th St	C	0.70	C	0.80
26	Long Beach Blvd / 7th St	E	0.96	D	0.80
27	Long Beach Blvd / 6th St	B	0.64	D	0.89
28	Long Beach Blvd / 3rd St	D	0.83	C	0.72
29	Long Beach Blvd / Broadway	A	0.44	D	0.82
30	Long Beach Blvd / Ocean Blvd	E	0.92	D	0.85
31	Atlantic Ave / Anaheim St	C	0.73	D	0.90
32	Atlantic Ave / 10th St	C	0.78	D	0.82
33	Atlantic Ave / 7th St	D	0.90	B	0.64
34	Atlantic Ave / 6th St	A	0.58	C	0.72
35	Atlantic Ave / 3rd St	B	0.62	A	0.55
36	Atlantic Ave / Broadway	A	0.34	C	0.74
37	Atlantic Ave / Ocean Blvd	C	0.76	C	0.72
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74
39	Martin Luther King Ave / 10th	A	0.54	B	0.69
40	Martin Luther King Ave / 7th S	E	0.94	D	0.80
41	Alamiitos Ave / Anaheim St	C	0.75	F	1.05
42	Alamitos Ave / 10th St	D	0.83	C	0.78
43	Alamitos Ave / 7th St	F	1.09	F	1.04
44	Alamitos Ave / 6th St	A	0.51	A	0.60
45	Alamitos Ave / 4th St	D	0.81	F	1.14
46	Alamitos Ave / 3rd St (*)	D	0.88	F	1.31
47	Alamitos Ave / Broadway	E	0.91	F	1.04
48	Alamitos/Shoreline Ave / Ocean	F	1.32	F	1.31
49	Orange Ave / 10th St	C	0.79	C	0.75
50	Orange Ave / 7th St	D	0.85	D	0.83
51	Orange Ave / 3rd St	A	0.58	A	0.40
52	Orange Ave / Broadway	A	0.48	C	0.73
53	Orange Ave / Ocean Blvd	D	0.85	D	0.89

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
using SYNCHRO 6 software because of
the unique signal phase at this

6.4 THRESHOLD OF SIGNIFICANCE

Based on the City of Long Beach Traffic Impact Guidelines, an impact is considered significant when the resulting level-of service with the project traffic is E or F and project related traffic (impact associated with the Community Plan) contributes a V/C of 0.020 or more to the critical movements.

Table 10 shows the LOS comparison between Existing, Future Without Project and Future With Project LOS conditions. As mentioned in the earlier section, the future year (Without and With Project conditions) conditions were analyzed with existing intersection geometry. As shown in **Table 10**, of the 16 intersections impacted with the "With Project" traffic conditions, 15 intersections are considered significant impacts per the Threshold of Significance criteria. The 15 intersections are:

- Magnolia Avenue and 7th Street – LOS E (AM Peak Hour)
- Magnolia Avenue and 6th Street – LOS E (PM Peak Hour)
- Magnolia Avenue and Ocean Boulevard – LOS F (AM Peak Hour)
- Pacific Avenue and Broadway – LOS E (PM Peak Hour)
- Pacific Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and 6th Street – LOS E (PM Peak Hour)
- Pine Avenue and Broadway – LOS F (PM Peak Hour)
- Long Beach Boulevard and 7th Street – LOS E (AM Peak Hour)
- Long Beach Boulevard and Ocean Boulevard – LOS E (AM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS F (AM and PM Peak Hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (AM Peak Hour) and LOS F (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

TABLE 10: LEVEL OF SERVICE COMPARISON AND PROJECT IMPACTS

	Intersection	Existing				Future Without Project				Future With Project				Community Plan Impact (Future With Community Plan - Future Without Projects)		Significant Impact Before Mitigation
		AM		PM		AM		PM		AM		PM		AM	PM	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	V/C	V/C	
1	Ocean Blvd / Golden Shore Ave	A	0.47	B	0.63	A	0.56	B	0.69	B	0.63	C	0.79	0.07	0.10	
2	Magnolia Ave / Anaheim St	C	0.72	C	0.71	C	0.73	C	0.72	C	0.74	C	0.72	0.00	0.00	
3	Magnolia Ave / 10th St	A	0.42	A	0.46	A	0.44	A	0.49	A	0.45	A	0.50	0.01	0.01	
4	Magnolia Ave / 7th St	B	0.67	A	0.48	D	0.89	C	0.74	E	0.92	C	0.76	0.03	0.02	YES
5	Magnolia Ave / 6th St	A	0.57	B	0.64	C	0.77	E	0.93	D	0.82	E	0.97	0.05	0.04	YES
6	Magnolia Ave / 3rd St	A	0.58	A	0.43	C	0.74	B	0.63	D	0.84	B	0.70	0.10	0.06	
7	Magnolia Ave / Broadway	B	0.61	A	0.54	C	0.74	B	0.70	C	0.78	C	0.79	0.04	0.09	
8	Magnolia Ave / Ocean Blvd	D	0.82	C	0.71	E	0.92	C	0.79	F	1.02	D	0.84	0.09	0.06	YES
9	Pacific Ave / Anaheim St	A	0.58	B	0.69	B	0.61	C	0.72	B	0.62	C	0.73	0.01	0.01	
10	Pacific Ave. / 10th Street	A	0.49	A	0.51	A	0.53	A	0.57	A	0.55	A	0.59	0.02	0.01	
11	Pacific Ave / 7th St	B	0.66	A	0.50	D	0.80	B	0.68	D	0.87	C	0.73	0.07	0.05	
12	Pacific Ave / 6th St	A	0.40	B	0.67	A	0.52	D	0.84	A	0.55	D	0.87	0.03	0.04	
13	Pacific Ave / 3rd St	A	0.52	A	0.42	B	0.64	A	0.55	B	0.69	A	0.59	0.05	0.04	
14	Pacific Ave / Broadway	A	0.39	B	0.69	A	0.54	D	0.86	A	0.57	E	0.92	0.03	0.07	YES
15	Pacific Ave / Ocean Blvd	C	0.75	B	0.62	D	0.82	B	0.66	E	0.92	C	0.75	0.10	0.09	YES
16	Pine Ave / Anaheim St	A	0.56	B	0.66	A	0.56	B	0.66	A	0.56	B	0.66	0.00	0.00	
17	Pine Ave. / 10th Street	A	0.46	A	0.43	A	0.48	A	0.46	A	0.48	A	0.47	0.01	0.01	
18	Pine Ave / 7th St	A	0.57	A	0.39	C	0.71	A	0.53	C	0.73	A	0.55	0.02	0.02	
19	Pine Ave / 6th St	A	0.44	B	0.69	A	0.56	D	0.88	A	0.59	E	0.91	0.02	0.03	YES
20	Pine Ave / 3rd St	A	0.58	A	0.31	C	0.74	A	0.44	D	0.82	A	0.49	0.08	0.05	
21	Pine Ave / Broadway	A	0.42	B	0.67	B	0.67	E	0.97	C	0.74	F	1.09	0.07	0.12	YES
22	Pine Ave / Ocean Blvd	A	0.54	B	0.67	B	0.64	B	0.67	C	0.73	C	0.75	0.09	0.09	
23	Shoreline Dr / Pine Ave	A	0.33	A	0.49	A	0.33	A	0.50	A	0.37	A	0.54	0.04	0.05	
24	Long Beach Blvd / Anaheim St	A	0.55	B	0.70	B	0.62	C	0.78	B	0.64	D	0.82	0.03	0.04	
25	Long Beach Blvd / 10th St	A	0.59	B	0.66	B	0.67	C	0.76	C	0.70	C	0.80	0.03	0.04	
26	Long Beach Blvd / 7th St	C	0.71	A	0.56	E	0.92	C	0.76	E	0.96	D	0.80	0.04	0.04	YES
27	Long Beach Blvd / 6th St	A	0.45	B	0.64	B	0.60	D	0.85	B	0.64	D	0.89	0.03	0.04	
28	Long Beach Blvd / 3rd St	A	0.53	A	0.42	C	0.77	B	0.67	D	0.83	C	0.72	0.06	0.04	
29	Long Beach Blvd / Broadway	A	0.32	B	0.61	A	0.41	C	0.76	A	0.44	D	0.82	0.03	0.06	
30	Long Beach Blvd / Ocean Blvd	C	0.70	B	0.67	D	0.82	C	0.74	E	0.92	D	0.85	0.09	0.11	YES
31	Atlantic Ave / Anaheim St	B	0.65	D	0.81	C	0.71	D	0.87	C	0.73	D	0.90	0.03	0.03	
32	Atlantic Ave / 10th St	B	0.67	B	0.69	C	0.76	C	0.79	C	0.78	D	0.82	0.03	0.03	
33	Atlantic Ave / 7th St	C	0.73	A	0.48	D	0.86	B	0.61	D	0.90	B	0.64	0.04	0.04	
34	Atlantic Ave / 6th St	A	0.47	A	0.58	A	0.55	B	0.68	A	0.58	C	0.72	0.03	0.04	
35	Atlantic Ave / 3rd St	A	0.45	A	0.37	A	0.57	A	0.50	B	0.62	A	0.55	0.05	0.05	
36	Atlantic Ave / Broadway	A	0.24	A	0.58	A	0.31	B	0.70	A	0.34	C	0.74	0.03	0.05	
37	Atlantic Ave / Ocean Blvd	B	0.61	A	0.58	B	0.68	B	0.65	C	0.76	C	0.72	0.08	0.08	
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74	C	0.77	C	0.74	C	0.77	C	0.74	0.00	0.00	
39	Martin Luther King Ave / 10th	A	0.52	B	0.66	A	0.54	B	0.69	A	0.54	B	0.69	0.00	0.00	
40	Martin Luther King Ave / 7th S	D	0.83	B	0.69	E	0.93	C	0.79	E	0.94	D	0.80	0.01	0.01	
41	Alamiitos Ave / Anaheim St	B	0.63	E	0.93	C	0.71	F	1.01	C	0.75	F	1.05	0.04	0.04	YES
42	Alamitos Ave / 10th St	B	0.68	B	0.65	C	0.79	C	0.73	D	0.83	C	0.78	0.04	0.04	
43	Alamitos Ave / 7th St	E	0.92	C	0.75	F	1.05	E	0.92	F	1.09	F	1.04	0.04	0.12	YES
44	Alamitos Ave / 6th St	A	0.36	A	0.40	A	0.45	A	0.53	A	0.51	A	0.60	0.06	0.07	
45	Alamitos Ave / 4th St	A	0.55	D	0.88	C	0.73	F	1.04	D	0.81	F	1.14	0.08	0.10	YES
46	Alamitos Ave / 3rd St (*)	C	0.74	D	0.88	D	0.88	F	1.26	D	0.88	F	1.31	0.00	0.05	YES
47	Alamitos Ave / Broadway	C	0.78	E	0.91	D	0.84	E	0.98	E	0.91	F	1.04	0.07	0.05	YES
48	Alamitos/Shoreline Ave / Ocean	F	1.06	F	1.02	F	1.18	F	1.18	F	1.32	F	1.31	0.14	0.13	YES
49	Orange Ave / 10th St	C	0.78	C	0.75	C	0.79	C	0.75	C	0.79	C	0.75	0.00	0.00	
50	Orange Ave / 7th St	C	0.75	C	0.71	D	0.82	C	0.80	D	0.85	D	0.83	0.03	0.03	
51	Orange Ave / 3rd St	A	0.51	A	0.38	A	0.57	A	0.40	A	0.58	A	0.40	0.02	0.00	
52	Orange Ave / Broadway	A	0.47	B	0.66	A	0.47	C	0.70	A	0.48	C	0.73	0.01	0.02	
53	Orange Ave / Ocean Blvd	B	0.70	C	0.72	C	0.80	D	0.84	D	0.85	D	0.89	0.05	0.06	

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
(*) LOS reported is based on analysis using SYNCHRO 6 software because of the unique signal phase at this intersection.

6.5 CONGESTION MANAGEMENT PROGRAM SYSTEM ANALYSIS

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system. A total of 164 intersections are identified for monitoring on the system in Los Angeles County. This section describes the analysis of project-related impacts on the CMP system. The analysis has been conducted according to the guidelines set forth in the 2002 Congestion Management Program for Los Angeles County.

6.5.1 CMP INTERSECTION ANALYSIS

The intersections of Alamitos Avenue with 7th Street and with Ocean Boulevard are the only study area intersections that are part of the CMP Arterial monitoring locations. For purposes of the CMP, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by two percent of capacity (V/C ≥ 0.02), causing LOS F (V/C > 1.00). If the facility is already at LOS F, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by two percent of capacity (V/C ≥ 0.02). The results of the capacity analysis indicate that the project will increase demand at both intersections by two percent (0.02) or more. Therefore, the project will have a significant CMP impact at the intersections. Discussions conducted with City staff along with other ongoing analysis of this location indicate that there are no feasible physical measures that could be developed at either intersection that would mitigate the Project's impact at this intersection. Therefore, the impact at this intersection would be considered significant and unavoidable.

6.5.2 CMP MAINLINE FREEWAY SEGMENT ANALYSIS

The focus of this analysis is to determine whether trips associated would significantly impact the freeway system according to CMP guidelines and threshold of significance. For purposes of analyzing the mainline freeway impact of the project, the nearest freeway monitoring station is CMP Station # 1078 located along the I-710 Freeway, north of the Pacific Coast Highway and Willow Street junction. **Table 11** summarizes the project added trips by time period, direction and location. The project added trips were compared with CMP Traffic Impact Analysis guidelines to determine if additional traffic impact analysis is needed at the freeway monitoring station.

As shown in **Table 11**, the trips associated with the Downtown Community Plan development contributes more than minimum threshold of 150 peak-period trips at the nearest Freeway CMP mainline location. However, per Chapter 5 – Land Use Analysis Program in the *2004 Congestion Management Program for Los Angeles*, the CMP guidelines are geared toward the analysis of projects where specific land use types and project design details are known. When the project is less specific and the proposed land uses and project design details are not well defined, the level of detail can be adjusted accordingly. Therefore, due to the conceptual character of the Downtown Community Plan, measures to mitigate impacts associated with the Downtown

Community Plan at the CMP locations are not fully investigated and evaluated. It is recommended that detailed mitigation measures be evaluated as and when specific tangible project information is available. Because this is a area wide plan, no further traffic analysis is required at this time. Such analysis would be when actual projects come forward for approval.

TABLE 11: PROJECT ADDED TRIPS AT FREEWAY MONITORING STATIONS

Freeway Analysis Segment	Project Added Trips by Direction		Traffic Impact Analysis Required?	
	NB	SB	NB	SB
Weekday AM Peak Hour				
I-710 Freeway north of Anaheim Street	438	560	Yes	Yes
Weekday PM Peak Hour				
I-710 Freeway north of Anaheim Street	614	517	Yes	Yes

Note the nearest CMP Freeway Monitoring station to the study area is located along I-710 at the PCH and Willow Street junction.

7.0 TRANSPORTATION SYSTEM IMPROVEMENT RECOMMENDATIONS

With the completion of Cumulative Projects and the Downtown Community Plan in the Downtown and Central area of the City, the capacity of the street system will become more intensely utilized. In 2009, only 4 of the 53 intersections are operating at LOS E or worse. In 2035, 16 intersections are expected to be operating at LOS E or worse. As the system's capacity is utilized, it will become important to manage the street system in a more efficient and coordinated manner. Improvements to the study area transportation system are proposed as part of the overall Downtown development including part of other area projects previously approved by the City of Long Beach.

7.1 CUMULATIVE MITIGATION MEASURES

Regional programs such as the Long Range Transportation Plan (LRTP) prepared by the Los Angeles County Metropolitan Transportation Authority (MTA), the Regional Transportation Plan (RTP), the Regional Transportation Improvement Plan (RTIP) prepared by the Southern California Association of Governments (SCAG), and the Statewide Transportation Improvement Plan (STIP) prepared by the California Department of Transportation (Caltrans) are all intended to address the cumulative mobility needs of Los Angeles County. The LRTP recommends HOV, transit, and demand management improvements and identified funding sources and implementation schedules. The RTP forecasts long-range transportation demands for the five-county SCAG region and identifies policies, actions, and funding sources to accommodate these demands, including construction of new transportation facilities, transportation system management strategies, transportation demand management strategies, and land use strategies. The RTP and STIP are programming documents listing all of the funded/programmed regional improvements.

7.2 RECOMMENDED TRANSPORTATION MITIGATION MEASURES

Many of the streets in Downtown Long Beach are critical north/south and east/west arterials that serve Downtown traffic, and also serve as either alternate routes to the Interstate 710 freeway connecting Downtown and coastal communities, or as pass-through routes for east/west traffic. In addition to the considerable number of commuter vehicles that drive on the arterial network, Downtown streets also function as highly travelled transit corridors for the City of Long Beach. There are many key traffic generators in Downtown and there will be more significant generators with the adoption and implementation of the Downtown Strategic Plan.

As discussed in this report, 15 intersections are forecasted to experience significant impacts as a result of the implementation of the Downtown Strategic Plan. However, due to right of way constraints and the inability to add physical capacity via widening, removal of parking or other measures, the ability to add physical roadway capacity is very limited. Thus, the mitigation must focus on achievable projects that will not require significant additional right-of-way and that are

achievable within the life of the plan. There are five proposed mitigation measures for the Downtown Community Plan, as follows:

1. Implement Traffic Control System Improvements in Downtown on selected arterials
2. Improve Alamitos Avenue corridor via removal of selected parking spaces and the implementation of additional travel lanes plus bike lanes in each direction.
3. Reconfigure/reconstruct the Martin Luther King Avenue/Alamitos Avenue/6th Street/7th Street location for safety and traffic flow enhancements.
4. Enhance Freeway Access to I-710 to and from Downtown Long Beach.
5. Transit Facilities / Programs to Encourage Public Transit Usage and TDM Policies

7.2.1 Implement Traffic Control System Improvements in Downtown on Selected Arterials

Therefore, consistent with the City of Los Angeles, a 10% benefit in the intersection traffic operation is assumed in the "With Mitigation" analysis scenario as shown in **Table 12**.

A series of traffic signal system improvements are recommended in Downtown to accommodate the anticipated growth in travel. The following traffic signal system improvements are recommended as part of this mitigation measure:

- Implement Adaptive Traffic Signal Control system improvements throughout Downtown consistent with currently planned improvements on Ocean Boulevard and Atlantic Avenue.
- Implement pan/tilt/zoom Closed Circuit Television Camera (CCTV) surveillance and communications with power and control capability to the Department of Public Works to monitor real-time traffic operations on rooftops of selected new building as needed and to be determined based on the location of appropriate new high rise structures along the Alamitos Avenue, Shoreline Drive and Ocean Boulevard corridors.
- Implement transit signal priority for Long Beach Boulevard and upgrade traffic signal system equipment and operations along the Blue Line light rail route
- Upgrade and improve traffic signal equipment throughout Downtown for safety and operational enhancements

Adaptive traffic control is an extremely versatile mode of traffic operations in that signal timing parameters are dynamically modified in real-time based on prevailing traffic conditions. The proposed Adaptive Traffic Control System (ATCS), which will be installed in the Downtown area, utilizes algorithms that perform very well in a grid network such as a typical Downtown setting. However, for adaptive operation to function on a grid network, it is essential that the adjacent intersections on the crossing corridors be included in the system.

An Adaptive Traffic Control System is recommended for implementation on key arterials within Downtown. The City of Long Beach has current plans to implement adaptive traffic control on Ocean Boulevard east of Alamitos Avenue as well as on Atlantic Avenue north of Ocean Avenue. The proposed mitigation will thus tie into and enhance the planned adaptive traffic

control system on those two corridors. Streets that are proposed to be included in the adaptive traffic control system as a mitigation measure for the Downtown Strategic Plan include the following:

- Alamitos Avenue north of Ocean Boulevard
- Pine Avenue north of Ocean Boulevard
- Pacific Avenue north of Ocean Boulevard
- 7th Street from the I-710 Freeway to Alamitos Avenue
- 6th Street from the I-710 Freeway to Alamitos Avenue
- Broadway from the I-710 Freeway to Alamitos Avenue
- Ocean Boulevard from Shoreline to Alamitos Avenue (to join the proposed system starting at Alamitos Avenue)
- Others as needed, to be determined by the City Traffic Engineer and Public Works Director

As part of this mitigation measure, a number of intersections would receive major or minor signal modifications, depending on their current status. In addition to the enhancements listed, other potential improvements that can be included are:

- Bicycle improvements (detection, signalization, etc)
- In-pavement LED crosswalk lights
- Automatic pedestrian detection (i.e. infrared, microwave or video detection)
- Illuminated push buttons
- Countdown pedestrian signal
- Adaptive pedestrian clearance (increasing the FDW time based on location of pedestrians in the crosswalk)
- Enhanced signal equipment including mast arms, poles, signal heads and indications and other necessary enhancements for safety and operations
- Communications enhancements as needed to tie the system together and with the Traffic Control Center in City Hall

7.2.2 Improve Alamitos Avenue Corridor

Alamitos Avenue shows up as the most impacted arterial roadway by the Downtown Plan, with the greatest impacts and the greatest number of poor service level intersections. In addition to the implementation of adaptive traffic control as described in this section, other mitigation is recommended to enhance the capacity of Alamitos Avenue. Currently, due to on-street parking, there is only one lane of travel on Alamitos Avenue in the southbound direction between 3rd Street and Broadway. The mitigation measure will remove parking spaces on the west side of the street, restripe and reconstruct the street, add a bike lane in each direction of travel and provide for two travel lanes in each direction plus exclusive left turn lanes from 7th Street to Ocean Boulevard. Traffic signal enhancements as needed to implement the Alamitos Avenue improvements are also included in the mitigation measure.

7.2.3 Improve the Martin Luther King Avenue/Alamitos Avenue/6th Street/7th Street location for safety and traffic flow enhancements

The City has considered a number of improvement options for these intersection locations, and a recommended plan is currently being prepared. A preferred improvement plan will be available that will result in improvements to safety and operational efficiency at this location. This area is a key gateway to and from Downtown, and also connects to Alamitos Avenue which is a major route for Downtown traffic and is shown to be significantly impacted by the growth in traffic due to the Plan. Due to the proximity of closely spaced intersections, this location experiences a considerable number of accidents and traffic incidents, and has inefficient operational patterns. Thus, the City's proposed improvement at this location is recommended as part of the Downtown Plan mitigation measures. The improvements will re-direct traffic in a more efficient and safe manner than the current configuration and will enhance capacity and safety for the multiple closely spaced intersections.

7.2.4 Enhance Freeway Access to and from I-710

The I-710 Major corridor study is investigating significant changes and improvements to the I-710 freeway. The freeway is the major gateway to Downtown Long Beach. As noted in the traffic study, approximately 40 to 50 percent of all added traffic flow into and out of Downtown will occur via the freeway. In addition, the bridge connection Downtown to the freeway and the adjacent park will be undergoing reconfiguration. There is a need for improvement to the freeway access to/from Downtown via the east west arterial roadways of Ocean Boulevard, 6th Street and 7th Street. The mitigation measure will result in strategic improvements to all of the freeway access streets, and may include signalization enhancements, capacity enhancements, changes to directional flow and other elements as required.

7.2.5 Transit Facilities / Programs to Encourage Public Transit Usage and TDM Policies

To encourage the use of public transit and non-auto trip making, the Project will include transportation demand management (TDM) feature outlined in the City's TDM policies including, where appropriate, bicycle parking, safe bicycle access to streets and parking, efficient pedestrian access, and pedestrian-friendly access to area transit facilities. The City's Bicycle master Plan includes on-street bike lanes along Broadway, 3rd Street, Magnolia, Pacific Avenue, and Alamitos Avenue. In addition, bicycle parking facilities are proposed along several streets and the existing Downtown "Bike Station" provides access to bicycles and service. All of the developments in the Project will be required to coordinate with area transit providers to accommodate and encourage transit use by residents and patrons. For non-residential sites, appropriate programs and facilities will be included to encourage car and van pooling, provide information on transportation alternatives, and encourage trip reduction strategies in accordance with the City's TDM policies for non-residential development.

7.3 MITIGATION MEASURE BENEFIT ANALYSIS

Traffic signal system synchronization alone will not solve the most congested intersections and corridors in the City, because signal timing and coordination is only one factor in traffic congestion. Improving signal timing and synchronization can achieve significant short-term reductions in traffic congestion. Since 1984, City of Los Angeles Department of Transportation (LADOT) has been utilizing the Automated Traffic Surveillance and Control ("ATSAC") System, a proprietary traffic control system to synchronize and manage the City's traffic signals. ATSAC uses computer traffic models to help with traffic signal timing, employing special detectors imbedded in the streets and remote-controlled video cameras mounted at key intersections to measure traffic flow and volume, vehicle speeds, and delays or congestion. Besides the short-term reductions in congestion, other benefits of traffic signal control include enhanced ability for incident and corridor management, potential emissions reduction by decreasing vehicle idling, improved safety by ensuring orderly movement of traffic, and greater mobility through the expanded capacity of the arterial network, particularly if the traffic control system provides for signal priority for high-capacity vehicles, such as rapid transit buses.

Developed in 1995, the Adaptive Traffic Control System ("ATCS") is the latest enhancement to ATSAC and uses a personal computer-based traffic signal control software program that provides fully adaptive traffic signal control based on real-time traffic conditions. The ATCS will automatically adjust traffic signal timing in response to current traffic demands. Although the ATCS implementation will not increase the capacity of the roadway, review of prior before-and-after studies conducted demonstrates that implementation of ATSAC and ATCS projects provided congestion relief by improving travel times, travel speeds, traffic progression and by reducing delay time at intersections. Furthermore, the ATCS retrofit was found to reduce the volume to capacity ratio by at least 3% to 10%.

With the implementation of the improvements mentioned above, **Table 12** illustrates that seven of the 15 intersections, significantly impacted by the Community Plan, operate at LOS D or better. In summary, after implementation of mitigation measures, the following eight intersections would remain as significant unavoidable adverse impacts:

- Magnolia Avenue and Ocean Boulevard – LOS E (AM Peak Hour)
- Pine Avenue and Broadway – LOS E (PM Peak Hour)
- Alamitos Avenue and Anaheim Street – LOS E (PM Peak Hour)
- Alamitos Avenue and 7th Street – LOS E (AM and PM Peak Hour)
- Alamitos Avenue and 4th Street – LOS F (PM Peak Hour)
- Alamitos Avenue and 3rd Street – LOS F (PM Peak Hour)
- Alamitos Avenue and Broadway – LOS E (PM Peak Hour)
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard – LOS F (AM and PM Peak Hour)

TABLE 12: YEAR 2035-WITH-PROJECT INTERSECTION OPERATING CONDITIONS WITH MITIGATION

	Intersection	Existing				Future Without Project				Future With Project				Community Plan Impact (Future With Community Plan - Future Without Projects)		Significant Impact Before Mitigation	Future With Project with Mitigation				Significant Impact Before Mitigation	Mitigation Type
		AM		PM		AM		PM		AM		PM		AM	PM		AM		PM			
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	V/C	V/C		LOS	V/C	LOS	V/C		
1	Ocean Blvd / Golden Shore Ave	A	0.47	B	0.63	A	0.56	B	0.69	B	0.63	C	0.79	0.07	0.10		B	0.63	C	0.79		
2	Magnolia Ave / Anaheim St	C	0.72	C	0.71	C	0.73	C	0.72	C	0.74	C	0.72	0.00	0.00		C	0.74	C	0.72		
3	Magnolia Ave / 10th St	A	0.42	A	0.46	A	0.44	A	0.49	A	0.45	A	0.50	0.01	0.01		A	0.45	A	0.50		
4	Magnolia Ave / 7th St	B	0.67	A	0.48	D	0.89	C	0.74	E	0.92	C	0.76	0.03	0.02	YES	D	0.83	B	0.69		ATCS Implementation
5	Magnolia Ave / 6th St	A	0.57	B	0.64	C	0.77	E	0.93	D	0.82	E	0.97	0.05	0.04	YES	C	0.74	D	0.87		ATCS Implementation
6	Magnolia Ave / 3rd St	A	0.58	A	0.43	C	0.74	B	0.63	D	0.84	B	0.70	0.10	0.06		D	0.84	B	0.70		
7	Magnolia Ave / Broadway	B	0.61	A	0.54	C	0.74	B	0.70	C	0.78	C	0.79	0.04	0.09		B	0.70	C	0.71		ATCS Implementation
8	Magnolia Ave / Ocean Blvd	D	0.82	C	0.71	E	0.92	C	0.79	F	1.02	D	0.84	0.09	0.06	YES	E	0.91	C	0.76	YES	ATCS Implementation
9	Pacific Ave / Anaheim St	A	0.58	B	0.69	B	0.61	C	0.72	B	0.62	C	0.73	0.01	0.01		A	0.56	B	0.66		ATCS Implementation
10	Pacific Ave. / 10th Street	A	0.49	A	0.51	A	0.53	A	0.57	A	0.55	A	0.59	0.02	0.01		A	0.49	A	0.53		ATCS Implementation
11	Pacific Ave / 7th St	B	0.66	A	0.50	D	0.80	B	0.68	D	0.87	C	0.73	0.07	0.05		C	0.79	B	0.65		ATCS Implementation
12	Pacific Ave / 6th St	A	0.40	B	0.67	A	0.52	D	0.84	A	0.55	D	0.87	0.03	0.04		A	0.50	C	0.78		ATCS Implementation
13	Pacific Ave / 3rd St	A	0.52	A	0.42	B	0.64	A	0.55	B	0.69	A	0.59	0.05	0.04		B	0.62	A	0.53		ATCS Implementation
14	Pacific Ave / Broadway	A	0.39	B	0.69	A	0.54	D	0.86	A	0.57	E	0.92	0.03	0.07	YES	A	0.51	D	0.83		ATCS Implementation
15	Pacific Ave / Ocean Blvd	C	0.75	B	0.62	D	0.82	B	0.66	E	0.92	C	0.75	0.10	0.09	YES	D	0.83	B	0.68		ATCS Implementation
16	Pine Ave / Anaheim St	A	0.56	B	0.66	A	0.56	B	0.66	A	0.56	B	0.66	0.00	0.00		A	0.50	A	0.60		ATCS Implementation
17	Pine Ave. / 10th Street	A	0.46	A	0.43	A	0.48	A	0.46	A	0.48	A	0.47	0.01	0.01		A	0.44	A	0.42		ATCS Implementation
18	Pine Ave / 7th St	A	0.57	A	0.39	C	0.71	A	0.53	C	0.73	A	0.55	0.02	0.02		B	0.66	A	0.49		ATCS Implementation
19	Pine Ave / 6th St	A	0.44	B	0.69	A	0.56	D	0.88	A	0.59	E	0.91	0.02	0.03	YES	A	0.53	D	0.82		ATCS Implementation
20	Pine Ave / 3rd St	A	0.58	A	0.31	C	0.74	A	0.44	D	0.82	A	0.49	0.08	0.05		C	0.73	A	0.44		ATCS Implementation
21	Pine Ave / Broadway	A	0.42	B	0.67	B	0.67	E	0.97	C	0.74	F	1.09	0.07	0.12	YES	B	0.66	E	0.98	YES	ATCS Implementation
22	Pine Ave / Ocean Blvd	A	0.54	B	0.67	B	0.64	B	0.67	C	0.73	C	0.75	0.09	0.09		B	0.66	B	0.68		ATCS Implementation
23	Shoreline Dr / Pine Ave	A	0.33	A	0.49	A	0.33	A	0.50	A	0.37	A	0.54	0.04	0.05		A	0.37	A	0.54		
24	Long Beach Blvd / Anaheim St	A	0.55	B	0.70	B	0.62	C	0.78	B	0.64	D	0.82	0.03	0.04		B	0.64	D	0.82		
25	Long Beach Blvd / 10th St	A	0.59	B	0.66	B	0.67	C	0.76	C	0.70	C	0.80	0.03	0.04		B	0.70	C	0.80		
26	Long Beach Blvd / 7th St	C	0.71	A	0.56	E	0.92	C	0.76	E	0.96	D	0.80	0.04	0.04	YES	C	0.86	C	0.72		ATCS Implementation
27	Long Beach Blvd / 6th St	A	0.45	B	0.64	B	0.60	D	0.85	B	0.64	D	0.89	0.03	0.04		A	0.57	C	0.80		ATCS Implementation
28	Long Beach Blvd / 3rd St	A	0.53	A	0.42	C	0.77	B	0.67	D	0.83	C	0.72	0.06	0.04		D	0.83	C	0.72		
29	Long Beach Blvd / Broadway	A	0.32	B	0.61	A	0.41	C	0.76	A	0.44	D	0.82	0.03	0.06		A	0.40	C	0.73		ATCS Implementation
30	Long Beach Blvd / Ocean Blvd	C	0.70	B	0.67	D	0.82	C	0.74	E	0.92	D	0.85	0.09	0.11	YES	D	0.82	C	0.76		ATCS Implementation
31	Atlantic Ave / Anaheim St	B	0.65	D	0.81	C	0.71	D	0.87	C	0.73	D	0.90	0.03	0.03		C	0.73	D	0.90		
32	Atlantic Ave / 10th St	B	0.67	B	0.69	C	0.76	C	0.79	C	0.78	D	0.82	0.03	0.03		C	0.78	D	0.82		
33	Atlantic Ave / 7th St	C	0.73	A	0.48	D	0.86	B	0.61	D	0.90	B	0.64	0.04	0.04		D	0.81	B	0.58		ATCS Implementation
34	Atlantic Ave / 6th St	A	0.47	A	0.58	A	0.55	B	0.68	A	0.58	C	0.72	0.03	0.04		A	0.52	B	0.65		ATCS Implementation
35	Atlantic Ave / 3rd St	A	0.45	A	0.37	A	0.57	A	0.50	B	0.62	A	0.55	0.05	0.05		B	0.62	A	0.55		
36	Atlantic Ave / Broadway	A	0.24	A	0.58	A	0.31	B	0.70	A	0.34	C	0.74	0.03	0.05		A	0.31	B	0.67		ATCS Implementation
37	Atlantic Ave / Ocean Blvd	B	0.61	A	0.58	B	0.68	B	0.65	C	0.76	C	0.72	0.08	0.08		B	0.69	B	0.65		ATCS Implementation
38	Martin Luther King Ave / Anahe	C	0.77	C	0.74	C	0.77	C	0.74	C	0.77	C	0.74	0.00	0.00		C	0.77	C	0.74		
39	Martin Luther King Ave / 10th	A	0.52	B	0.66	A	0.54	B	0.69	A	0.54	B	0.69	0.00	0.00		A	0.54	B	0.69		
40	Martin Luther King Ave / 7th S	D	0.83	B	0.69	E	0.93	C	0.79	E	0.94	D	0.80	0.01	0.01		E	0.94	C	0.80		
41	Alamiitos Ave / Anaheim St	B	0.63	E	0.93	C	0.71	F	1.01	C	0.75	F	1.05	0.04	0.04	YES	B	0.67	E	0.95	YES	ATCS Implementation
42	Alamitos Ave / 10th St	B	0.68	B	0.65	C	0.79	C	0.73	D	0.83	C	0.78	0.04	0.04		C	0.74	B	0.70		ATCS Implementation
43	Alamitos Ave / 7th St	E	0.92	C	0.75	F	1.05	E	0.92	F	1.09	F	1.04	0.04	0.12	YES	E	0.98	E	0.94	YES	ATCS Implementation
44	Alamitos Ave / 6th St	A	0.36	A	0.40	A	0.45	A	0.53	A	0.51	A	0.60	0.06	0.07		A	0.46	A	0.54		ATCS Implementation
45	Alamitos Ave / 4th St	A	0.55	D	0.88	C	0.73	F	1.04	D	0.81	F	1.14	0.08	0.10	YES	C	0.73	F	1.02	YES	ATCS Implementation
46	Alamitos Ave / 3rd St (*)	C	0.74	D	0.88	D	0.88	F	1.26	D	0.88	F	1.31	0.00	0.05	YES	C	0.74	F	1.18	YES	Geometric Improvement/ATCS
47	Alamitos Ave / Broadway	C	0.78	E	0.91	D	0.84	E	0.98	E	0.91	F	1.04	0.07	0.05	YES	D	0.64	E	0.94	YES	Geometric Improvement/ATCS
48	Alamitos/Shoreline Ave / Ocean	F	1.06	F	1.02	F	1.18	F	1.18	F	1.32	F	1.31	0.14	0.13	YES	F	1.19	F	1.18	YES	ATCS Implementation
49	Orange Ave / 10th St	C	0.78	C	0.75	C	0.79	C	0.75	C	0.79	C	0.75	0.00	0.00		C	0.79	C	0.75		
50	Orange Ave / 7th St	C	0.75	C	0.71	D	0.82	C	0.80	D	0.85	D	0.83	0.03	0.03		D	0.85	D	0.83		
51	Orange Ave / 3rd St	A	0.51	A	0.38	A	0.57	A	0.40	A	0.58	A	0.40	0.02	0.00		A	0.58	A	0.40		
52	Orange Ave / Broadway	A	0.47	B	0.66	A	0.47	C	0.70	A	0.48	C	0.73	0.01	0.02		A	0.48	C	0.73		
53	Orange Ave / Ocean Blvd	B	0.70	C	0.72	C	0.80	D	0.84	D	0.85	D	0.89	0.05	0.06		D	0.85	D	0.89		

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity (1600 vplph)
(*) LOS reported is based on analysis using SYNCHRO 6 software because of the unique signal phase at this intersection.
The V/C (with mitigation conditions) with ATCS Implementation is based on 10% improvement in V/C over the "Future With Project" conditions
The V/C (with mitigation conditions) for intersections #46 and #47 is based on 10% improvement in V/C over the "Future With Project" with the ATCS implementation plus the geometric improvement (addition of southbound through) conditions

APPENDIX A: TRAFFIC COUNTS

APPENDIX B: CAPACITY ANALYSES (EXISTING CONDITIONS)

APPENDIX C: CAPACITY ANALYSES (WITHOUT PROJECT CONDITIONS)

APPENDIX D: CAPACITY ANALYSES WITH PROJECT CONDITIONS