MEMORANDUM

To:	Ms. Jennifer M. Daw Chick-fil-A, Inc.	Date:	May 10, 2019
From:	Keil D. Maberry, P.E., Principal LLG Engineers	LLG Ref:	2.18.3939.1
Subject:	***Supplemental Drive-Through Queuing Analysis – Chick-fil-A Main Street, Orange***		

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As requested, Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following *Supplemental* Drive-Through Queuing Analysis for the proposed Chick-fil-A Main Street Project. The project site is located on the southwest quadrant of Main Street and Almond Avenue in the City of Orange, California. The Project proposes to demolish the existing vacant structure on the site and construct a 4,563 square-foot (SF) Chick-fil-A restaurant with drive-through window with storage for 17 vehicles. Site access for the Project will be provided via one (1) unsignalized, full-access driveway located along Almond Avenue and one (1) unsignalized, right-turn in/right-turn out only driveway located along Main Street (Project Driveway No. 2). As we understand it, City Staff has requested the preparation of a Drive-Through Queuing Analysis at locations that are stand-alone sites to further confirm the adequacy of storage provided for the proposed drive-through lane.

Existing queuing observations were conducted at the following two (2) existing stand-alone Chick-fil-A restaurants.

- Chick-fil-A Long Beach, 4401 Pacific Coast Highway
- Chick-fil-A Venice, located at 4050 Lincoln Boulevard

Drive-through queuing observations were conducted at the two (2) locations on two weekdays during the mid-day and evening service periods, generally between the hours of 11:00 AM and 2:00 PM and 5:00 PM and 8:00 PM. Saturday queuing observations were also collected between 11:00 AM and 2:00 PM and 6:00 PM and 9:00 PM. The queuing observations for the Long Beach Chick-fil-A were conducted by Transportation Studies Inc. (TSI) on Thursday April 25, 2019, Friday April 26, 2019 and Saturday April 27, 2019. The queuing observations for the Venice Chick-fil-A were conducted by City Traffic Counters on Wednesday February 20, 2019, Friday February 22, 2019 and Saturday February 23, 2019. The vehicular queues observed at the two (2) sites were recorded at 5-minute intervals. The results of the queuing observations surveys are included in ***Appendix A*** along with the existing aerial map for each location.

Tables 1, 2 and ***3*** summarize the Queue Frequency that was observed at the two sites for weekday (Wednesday/Thursday), weekday (Friday) and weekend (Saturday) peak periods, respectively. Our evaluation of this data indicates that on average during the

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weekday (Wednesday/Thursday) peak periods, an average queue of 10 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 15 vehicles, a 95th percentile queue of approximately 17 vehicles and a max queue of approximately 20 vehicles. Similarly, our evaluation of this data indicates that on average during the weekday (Friday) peak periods, an average queue of 10 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 14 vehicles, a 95th percentile queue of approximately 15 vehicles and a max queue of approximately 18 vehicles. In addition, our evaluation of this data also indicates that on average during the weekend (Saturday) peak periods, an average queue of 8 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 13 vehicles, a 95th percentile queue of approximately 15 vehicles and a max queue of approximately 19 vehicles. It should be noted that the 85th percentile queue is generally utilized when designing/sizing the length of the proposed drive-through lane.

In conclusion, the two (2) study sites experienced an 85th percentile queue range between 13 vehicles and 15 vehicles. As stated previously, the proposed Project will provide storage for up to 17 vehicles within the proposed drive-through lane without encroaching into the drive aisle. Therefore, the 85th percentile expected queues can be accommodated without interfering with internal circulation or causing congestion to the drive aisles. It should be further noted that the proposed 17 vehicle storage drive-through lane can also accommodate the observed 95th percentile queues (i.e. queue range between 15 vehicles and 17 vehicles). It should be further noted that the maximum queue of 20 vehicles, which only occurred two times and only at one site throughout the survey days, can be accommodated on-site within the drive aisles without impacting traffic flow on Almond Avenue.

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We appreciate the opportunity to provide this Drive-Through Queuing Analysis. Please contact us at (949) 825-6175 if you have any questions.

Attachments

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TABLE 1

WEEKDAY QUEUING ANALYSIS SUMMARY[1]

CHICK-FIL-A MAIN STREET, ORANGE

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed			Cumulative	
	Site #1 4401 Pacific Coast Hwy, Long Beach, CA	Site #2 4050 Lincoln Blvd, Venice, CA	Total	Frequency	Percentage
0	0	0	0	**0**	**0.0%**
1	0	3	3	**3**	**2.1%**
2	0	9	9	**12**	**8.5%**
3	0	4	4	**16**	**11.3%**
4	0	7	7	**23**	**16.2%**
5	4	8	12	**35**	**24.6%**
6	4	7	11	**46**	**32.4%**
7	3	4	7	**53**	**37.3%**
8	2	4	6	**59**	**41.5%**
9	4	5	9	**68**	**47.9%**
10	6	5	11	**79**	**55.6%**
11	9	5	14	**93**	**65.5%**
12	10	1	11	**104**	**73.2%**
13	4	2	6	**110**	**77.5%**
14	7	2	9	**119**	**83.8%**
15	7	1	8	**127**	**89.4%**
16	5	0	5	**132**	**93.0%**
17	3	1	4	**136**	**95.8%**
18	2	0	2	**138**	**97.2%**
19	2	0	2	**140**	**98.6%**
20	2	0	2	**142**	**100.0%**
Total	**74**	**68**	**142**	**--**	**--**
Average	**12.0**	**7.0**	**10.0**	**--**	**--**
85th Percentile	**16.0**	**11.0**	**15.0**	**--**	**--**
95th Percentile	**18.0**	**14.0**	**17.0**	**--**	**--**
Max	**20.0**	**17.0**	**20.0**	**--**	**--**

[1] Source: Queuing surveys at Site #1 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 5:00PM to 8:00PM, by Transportation Studies, Inc. on Thursday, April 25, 2019. Queuing surveys at Site #2 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 5:00PM to 7:30PM, by City Traffic Counters on Wednesday, February 20, 2019.

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TABLE 2

FRIDAY QUEUING ANALYSIS SUMMARY[2]

CHICK-FIL-A MAIN STREET, ORANGE

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed			Cumulative	
	Site #1 4401 Pacific Coast Hwy, Long Beach, CA	Site #2 4050 Lincoln Blvd, Venice, CA	Total	Frequency	Percentage
0	0	0	0	**0**	**0.0%**
1	0	3	3	**3**	**2.0%**
2	0	2	2	**5**	**3.4%**
3	1	7	8	**13**	**8.8%**
4	2	9	11	**24**	**16.2%**
5	0	8	8	**32**	**21.6%**
6	0	8	8	**40**	**27.0%**
7	3	5	8	**48**	**32.4%**
8	3	8	11	**59**	**39.9%**
9	8	4	12	**71**	**48.0%**
10	9	7	16	**87**	**58.8%**
11	6	6	12	**99**	**66.9%**
12	9	1	10	**109**	**73.6%**
13	10	4	14	**123**	**83.1%**
14	11	1	12	**135**	**91.2%**
15	8	1	9	**144**	**97.3%**
16	1	0	1	**145**	**98.0%**
17	2	0	2	**147**	**99.3%**
18	1	0	1	**148**	**100.0%**
Total	**74**	**74**	**148**	--	--
Average	**12.0**	**7.0**	**10.0**	--	--
85th Percentile	**15.0**	**11.0**	**14.0**	--	--
95th Percentile	**15.0**	**13.0**	**15.0**	--	--
Max	**18.0**	**15.0**	**18.0**	--	--

[2] Source: Queuing surveys at Site #1 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 5:00PM to 8:00PM, by Transportation Studies, Inc. on Friday, April 26, 2019. Queuing surveys at Site #2 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 5:00PM to 8:00PM, by City Traffic Counters on Friday, February 22, 2019.

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TABLE 3

SATURDAY QUEUING ANALYSIS SUMMARY[3]

CHICK-FIL-A MAIN STREET, ORANGE

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed			Cumulative	
	Site #1 4401 Pacific Coast Hwy, Long Beach, CA	Site #2 4050 Lincoln Blvd, Venice, CA	Total	Frequency	Percentage
0	0	0	0	**0**	**0.0%**
1	0	1	1	**1**	**0.7%**
2	1	1	2	**3**	**2.0%**
3	2	4	6	**9**	**6.1%**
4	2	10	12	**21**	**14.2%**
5	0	16	16	**37**	**25.0%**
6	3	11	14	**51**	**34.5%**
7	5	9	14	**65**	**43.9%**
8	7	10	17	**82**	**55.4%**
9	12	7	19	**101**	**68.2%**
10	8	4	12	**113**	**76.4%**
11	6	0	6	**119**	**80.4%**
12	5	1	6	**125**	**84.5%**
13	10	0	10	**135**	**91.2%**
14	2	0	2	**137**	**92.6%**
15	6	0	6	**143**	**96.6%**
16	2	0	2	**145**	**98.0%**
17	1	0	1	**146**	**98.6%**
18	1	0	1	**147**	**99.3%**
19	1	0	1	**148**	**100.0%**
Total	**74**	**74**	**148**	--	--
Average	**10.0**	**6.0**	**8.0**	--	--
85th Percentile	**14.0**	**9.0**	**13.0**	--	--
95th Percentile	**16.0**	**10.0**	**15.0**	--	--
Max	**19.0**	**12.0**	**19.0**	--	--

[3] Source: Queuing surveys at Site #1 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 6:00PM to 9:00PM, by Transportation Studies, Inc. on Saturday, April 27, 2019. Queuing surveys at Site #2 were conducted every 5 minutes, between the hours of 11:00AM to 2:00PM and 6:00PM to 9:00PM, by City Traffic Counters on Saturday, February 23, 2019.

APPENDIX A

QUEUING DATA

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N NO SCALE

SOURCE: GOOGLE

KEY

= SITE #1: 4401 PACIFIC COAST HWY, LONG BEACH

FIGURE A-1

SITE #1
4401 PACIFIC COAST HIGHWAY
CHICK-FIL-A MAIN STREET, ORANGE

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Thursday April 25, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
11:00 AM	2	5		2 Order Takers Outside
11:05 AM	2	5		3 Order Takers Outside
11:10 AM	0	6		3 Order Takers Outside
11:15 AM	4	12		3 Order Takers Outside
11:20 AM	2	11		3 Order Takers Outside
11:25 AM	2	9		3 Order Takers Outside
11:30 AM	2	6		3 Order Takers Outside
11:35 AM	4	7		3 Order Takers Outside
11:40 AM	5	13		3 Order Takers Return Inside
11:45 AM	3	11		
11:50 AM	4	12		
11:55 AM	5	10		
12:00 PM	4	12		
12:05 PM	6	11		
12:10 PM	5	15		
12:15 PM	5	14		
12:20 PM	5	15		
12:25 PM	10	15		
12:30 PM	6	16		
12:35 PM	5	12		
12:40 PM	6	15		
12:45 PM	6	16		
12:50 PM	1	9		
12:55 PM	4	12		
1:00 PM	10	17		
1:05 PM	10	19		
1:10 PM	6	14		
1:15 PM	11	18		
1:20 PM	8	16		
1:25 PM	8	15		
1:30 PM	6	15		
1:35 PM	7	17		
1:40 PM	7	16		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Thursday April 25, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
1:45 PM	4	12		
1:50 PM	4	12		
1:55 PM	5	14		
2:00 PM	5	13		
5:00 PM	12	20		
5:05 PM	6	14		
5:10 PM	4	10		
5:15 PM	4	12		
5:20 PM	3	11		1 Order Taker Outside
5:25 PM	5	13		
5:30 PM	4	11		2 Order Takers Outside
5:35 PM	3	9		
5:40 PM	1	6		
5:45 PM	2	5		
5:50 PM	6	10		
5:55 PM	4	10		
6:00 PM	5	13		
6:05 PM	4	11		
6:10 PM	2	7		
6:15 PM	1	5		
6:20 PM	3	8		3 Order Takers Outside
6:25 PM	2	7		
6:30 PM	5	11		
6:35 PM	2	6		
6:40 PM	6	14		
6:45 PM	6	14		
6:50 PM	8	16		
6:55 PM	10	18		
7:00 PM	4	11		
7:05 PM	4	12		
7:10 PM	2	8		
7:15 PM	3	10		
7:20 PM	3	10		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Thursday April 25, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
7:25 PM	12	19		
7:30 PM	13	20		
7:35 PM	10	17		
7:40 PM	3	9		
7:45 PM	5	14		
7:50 PM	5	12		
7:55 PM	4	11		
8:00 PM	8	15		
	Max	**20**		
	Sum	**896**		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Friday April 26, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
11:00 AM	3	3		2 Order Takers Outside
11:05 AM	1	4		
11:10 AM	3	7		3 Order Takers Outside
11:15 AM	6	9		
11:20 AM	5	10		
11:25 AM	5	12		
11:30 AM	6	14		
11:35 AM	7	15		
11:40 AM	2	9		
11:45 AM	7	12		
11:50 AM	4	13		
11:55 AM	6	14		
12:00 PM	8	14		
12:05 PM	6	13		
12:10 PM	6	11		
12:15 PM	7	14		
12:20 PM	6	14		
12:25 PM	6	13		
12:30 PM	6	14		
12:35 PM	7	12		
12:40 PM	5	13		
12:45 PM	6	13		
12:50 PM	5	13		
12:55 PM	5	10		
1:00 PM	5	12		
1:05 PM	4	10		
1:10 PM	5	12		
1:15 PM	7	15		
1:20 PM	9	15		
1:25 PM	7	15		
1:30 PM	6	15		
1:35 PM	8	16		
1:40 PM	6	14		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Friday April 26, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
1:45 PM	5	12		
1:50 PM	5	12		
1:55 PM	3	10		
2:00 PM	7	14		
5:00 PM	5	12		
5:05 PM	4	11		
5:10 PM	0	7		
5:15 PM	6	10		
5:20 PM	5	13		
5:25 PM	6	11		
5:30 PM	2	7		
5:35 PM	3	4		
5:40 PM	2	8		
5:45 PM	2	9		
5:50 PM	3	8		
5:55 PM	4	8		
6:00 PM	3	11		
6:05 PM	3	10		
6:10 PM	9	17		
6:15 PM	10	18		
6:20 PM	8	15		
6:25 PM	4	12		
6:30 PM	8	15		
6:35 PM	9	17		
6:40 PM	6	14		
6:45 PM	1	9		
6:50 PM	7	13		
6:55 PM	6	14		
7:00 PM	4	11		
7:05 PM	1	10		
7:10 PM	3	9		
7:15 PM	3	9		
7:20 PM	2	10		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Friday April 26, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
7:25 PM	4	13		
7:30 PM	3	9		
7:35 PM	3	10		
7:40 PM	8	15		
7:45 PM	5	14		
7:50 PM	5	13		
7:55 PM	1	11		
8:00 PM	3	9		
	Max	**18**		
	Sum	**864**		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Saturday April 27, 2019

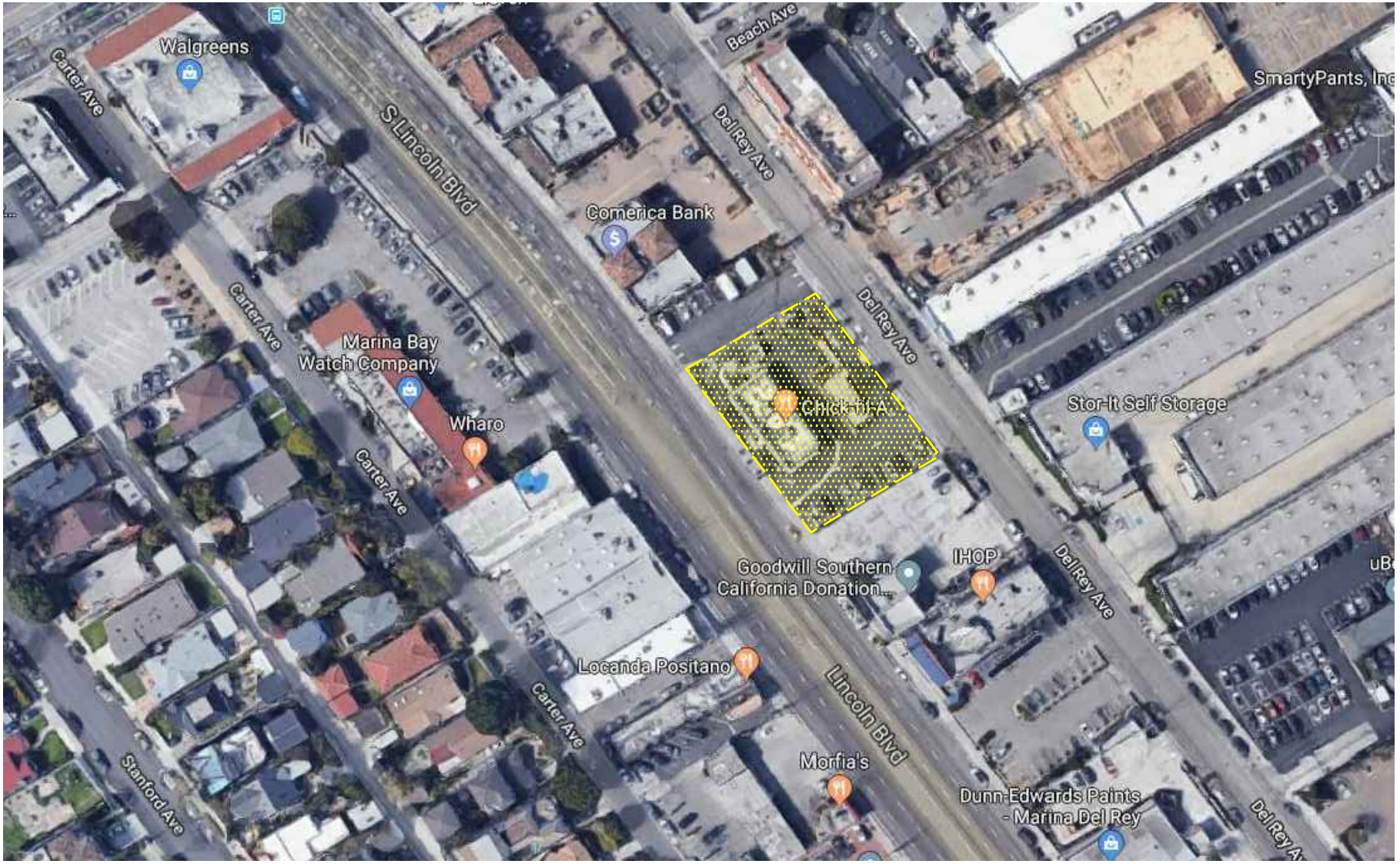
Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
11:00 AM	4	8		
11:05 AM	1	7		
11:10 AM	8	10		
11:15 AM	8	13		
11:20 AM	7	11		
11:25 AM	4	12		
11:30 AM	5	10		
11:35 AM	1	7		
11:40 AM	3	8		
11:45 AM	5	10		
11:50 AM	0	6		
11:55 AM	8	8		
12:00 PM	2	10		
12:05 PM	3	9		
12:10 PM	4	9		
12:15 PM	9	13		
12:20 PM	5	9		
12:25 PM	5	10		
12:30 PM	3	11		
12:35 PM	5	9		
12:40 PM	3	8		
12:45 PM	6	10		
12:50 PM	4	12		
12:55 PM	7	9		
1:00 PM	7	13		
1:05 PM	6	14		
1:10 PM	4	11		
1:15 PM	4	9		
1:20 PM	3	7		
1:25 PM	2	6		
1:30 PM	3	10		
1:35 PM	4	11		
1:40 PM	2	9		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Saturday April 27, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
1:45 PM	1	9		
1:50 PM	4	9		
1:55 PM	4	12		
2:00 PM	1	9		
6:00 PM	8	15		
6:05 PM	10	16		
6:10 PM	5	12		
6:15 PM	0	7		
6:20 PM	0	3		
6:25 PM	1	2		
6:30 PM	1	4		
6:35 PM	1	4		
6:40 PM	1	3		
6:45 PM	2	6		
6:50 PM	2	8		
6:55 PM	4	10		
7:00 PM	1	7		
7:05 PM	3	8		
7:10 PM	2	8		
7:15 PM	4	11		
7:20 PM	3	9		
7:25 PM	5	12		
7:30 PM	5	13		
7:35 PM	8	17		
7:40 PM	4	15		
7:45 PM	3	13		
7:50 PM	10	19		
7:55 PM	7	15		
8:00 PM	6	13		
8:05 PM	7	13		
8:10 PM	6	13		
8:15 PM	8	15		
8:20 PM	4	11		

Queuing Observations
Chick-fil-A (4401 Pacific Coast Highway, Long Beach)
Saturday April 27, 2019

Beginning Time	Max Queue		Street Overflow	Notes
	Order Board Back #	Entire Drive Thru		
8:25 PM	7	14		
8:30 PM	3	9		
8:35 PM	8	13		
8:40 PM	8	16		
8:45 PM	5	13		
8:50 PM	10	18		
8:55 PM	6	15		
9:00 PM	8	15		
	Max	**19**		
	Sum	**773**		



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N NO SCALE

SOURCE: GOOGLE

KEY

= SITE #2: 4050 LINCOLN BOULEVARD, VENICE

FIGURE A-2

SITE #2
4050 LINCOLN BOULEVARD
CHICK-FIL-A MAIN STREET, ORANGE

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
WEDNESDAY, FEBRUARY 20, 2019

WEEKDAY MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
AM	11:00	1	0	4		
	11:05	6	0	1		
	11:10	2	3	4		
	11:15	5	1	5		
	11:20	4	1	5		
	11:25	3	2	2		
	11:30	4	2	3		
	11:35	4	2	2		
	11:40	2	0	2		
	11:45	6	0	1		
	11:50	0	1	4		
	11:55	5	1	2		
PM	12:00	7	2	4		
	12:05	3	2	8		2 ORDER TAKERS ARRIVE OUTSIDE
	12:10	8	3	6		2 ORDER TAKERS OUTSIDE
	12:15	8	3	10	12:18PM-12:22PM Drive Thru	2 ORDER TAKERS OUTSIDE
	12:20	8	10	17		2 ORDER TAKERS OUTSIDE
	12:25	3	5	11		2 ORDER TAKERS OUTSIDE
	12:30	6	0	5		2 ORDER TAKERS OUTSIDE
	12:35	7	0	5		2 ORDER TAKERS OUTSIDE

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
WEDNESDAY, FEBRUARY 20, 2019

WEEKDAY MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	12:40	8	1	5		2 ORDER TAKERS OUTSIDE
	12:45	5	6	7		2 ORDER TAKERS OUTSIDE
	12:50	1	4	11		2 ORDER TAKERS OUTSIDE
	12:55	6	0	1		2 ORDER TAKERS OUTSIDE
	1:00	4	5	6		2 ORDER TAKERS OUTSIDE
	1:05	11	4	8		2 ORDER TAKERS OUTSIDE
	1:10	6	5	11	1:11PM-1:12PM Drive Thru	2 ORDER TAKERS OUTSIDE
	1:15	7	7	12		2 ORDER TAKERS OUTSIDE
	1:20	5	7	14		2 ORDER TAKERS OUTSIDE
	1:25	10	3	9		2 ORDER TAKERS OUTSIDE
	1:30	6	7	14	1:30PM-1:32PM Drive Thru	2 ORDER TAKERS OUTSIDE
	1:35	7	2	9		2 ORDER TAKERS OUTSIDE
	1:40	5	3	6		2 ORDER TAKERS OUTSIDE
	1:45	6	3	5		2 ORDER TAKERS OUTSIDE
	1:50	6	1	5		2 ORDER TAKERS RETURN INSIDE
	1:55	5	2	4		
	2:00	7	1	3		

TOTAL ARRIVAL: **197**

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
WEDNESDAY, FEBRUARY 20, 2019

WEEKDAY EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	5:00	4	1	2		
	5:05	1	1	2		
	5:10	3	2	2		
	5:15	4	0	2		
	5:20	6	2	4		
	5:25	6	3	5		
	5:30	5	4	6		
	5:35	4	5	10	5:36PM-5:40PM Drive Thru	
	5:40	2	4	6		
	5:45	5	4	6		
	5:50	4	5	9		
	5:55	3	6	10		
	6:00	4	3	8		
	6:05	2	3	7		
	6:10	2	0	3		
	6:15	4	1	2		

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
WEDNESDAY, FEBRUARY 20, 2019

WEEKDAY EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	6:20	6	2	3		
	6:25	5	2	4		
	6:30	7	3	6		
	6:35	4	3	9		
	6:40	4	8	13		
	6:45	5	4	10		
	6:50	6	4	11		
	6:55	5	4	10	6:56PM-7:00PM Drive Thru	1 ORDER TAKER ARRIVES OUTSIDE
	7:00	6	8	15		1 ORDER TAKER OUTSIDE
	7:05	4	6	13		1 ADDITIONAL ORDER TAKER ARRIVES
	7:10	5	2	7		2 ORDER TAKERS OUTSIDE
	7:15	5	2	9		2 ORDER TAKERS OUTSIDE
	7:20	4	5	11		2 ORDER TAKERS OUTSIDE
	7:25	4	2	8		2 ORDER TAKERS OUTSIDE
	7:30	5	0	7		2 ORDER TAKERS OUTSIDE

TOTAL ARRIVAL: **134**

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
FRIDAY, FEBRUARY 22, 2019

WEEKDAY MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
AM	11:00	3	1	7		
	11:05	5	1	6		
	11:10	4	1	5		
	11:15	4	1	5		
	11:20	3	2	6		
	11:25	5	1	2		
	11:30	8	2	4		
	11:35	3	5	10		
	11:40	4	3	9		
	11:45	5	2	6		
	11:50	8	0	5		
	11:55	1	3	8		
PM	12:00	6	0	4		
	12:05	2	4	8		2 ORDER TAKERS ARRIVE OUTSIDE
	12:10	5	0	4		2 ORDER TAKERS OUTSIDE
	12:15	6	0	5		2 ORDER TAKERS OUTSIDE
	12:20	7	1	4	12:24 - 12:26 - Drive Thru	2 ORDER TAKERS OUTSIDE
	12:25	7	5	10		2 ORDER TAKERS OUTSIDE
	12:30	6	6	12		2 ORDER TAKERS OUTSIDE
	12:35	11	5	11	12:37 - 12:39 - Drive Thru	2 ORDER TAKERS OUTSIDE

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
FRIDAY, FEBRUARY 22, 2019

WEEKDAY MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	12:40	5	6	13	12:40 - 12:46 - Drive Thru	2 ORDER TAKERS OUTSIDE
	12:45	6	5	11		2 ORDER TAKERS OUTSIDE
	12:50	6	2	8		2 ORDER TAKERS OUTSIDE
	12:55	7	3	6		2 ORDER TAKERS OUTSIDE
	1:00	10	2	8		2 ORDER TAKERS OUTSIDE
	1:05	5	6	8		1 ORDER TAKER RETURNS INSIDE
	1:10	7	2	5		1 ORDER TAKER OUTSIDE
	1:15	8	5	7	1:17 - 1:18 - Drive Thru	1 ADDITIONAL ORDER TAKER ARRIVES
	1:20	5	7	13		2 ORDER TAKERS OUTSIDE
	1:25	3	7	14		2 ORDER TAKERS OUTSIDE
	1:30	9	2	6		2 ORDER TAKERS OUTSIDE
	1:35	7	3	10		2 ORDER TAKERS OUTSIDE
	1:40	9	1	4	1:42 - 1:44 - Drive Thru	2 ORDER TAKERS OUTSIDE
	1:45	8	7	11		2 ORDER TAKERS OUTSIDE
	1:50	6	7	13	1:50 - 1:55 - Drive Thru	2 ORDER TAKERS OUTSIDE
	1:55	4	9	15		2 ORDER TAKERS OUTSIDE
	2:00	7	2	9		2 ORDER TAKERS OUTSIDE

TOTAL ARRIVAL: **215**

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
FRIDAY, FEBRUARY 22, 2019

WEEKDAY EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	5:00	6	2	4		
	5:05	5	7	8		
	5:10	4	6	1		1 ORDER TAKER ARRIVES OUTSIDE
	5:15	2	3	3		1 ORDER TAKER OUTSIDE
	5:20	4	2	3		1 ORDER TAKER RETURNS INSIDE
	5:25	5	1	2		
	5:30	3	1	3		
	5:35	7	0	1		
	5:40	2	3	4		
	5:45	5	1	3		
	5:50	7	1	4		
	5:55	8	7	10		
	6:00	2	6	10		
	6:05	5	5	6		1 ORDER TAKER ARRIVES OUTSIDE
	6:10	4	5	10		1 ORDER TAKER OUTSIDE
	6:15	6	3	8		1 ADDITIONAL ORDER TAKER ARRIVES

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
FRIDAY, FEBRUARY 22, 2019

WEEKDAY EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	6:20	2	6	13		2 ORDER TAKERS OUTSIDE
	6:25	5	2	5		1 ORDER TAKER RETURNS INSIDE
	6:30	4	0	3		1 ORDER TAKER OUTSIDE
	6:35	6	2	5		1 ORDER TAKER OUTSIDE
	6:40	2	3	6		1 ORDER TAKER OUTSIDE
	6:45	5	0	1		1 ORDER TAKER OUTSIDE
	6:50	4	3	4		1 ORDER TAKER OUTSIDE
	6:55	3	1	3		1 ORDER TAKER OUTSIDE
	7:00	4	1	3		1 ORDER TAKER OUTSIDE
	7:05	6	4	7		1 ORDER TAKER OUTSIDE
	7:10	6	5	7		1 ADDITIONAL ORDER TAKER ARRIVES
	7:15	3	3	5		1 ORDER TAKER RETURNS INSIDE
	7:20	7	2	7		1 ORDER TAKER OUTSIDE
	7:25	1	6	10		1 ORDER TAKER OUTSIDE
	7:30	6	7	11		1 ORDER TAKER OUTSIDE
	7:35	5	5	9	7:35 - 7:39 - Drive Thru	1 ORDER TAKER OUTSIDE

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
FRIDAY, FEBRUARY 22, 2019

WEEKDAY EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING TIME	TOTAL # OF CARS	ORDER BOARD BACK #	ENTIRE DRIVE THRU	STREET OVERFLOW	NOTES
PM	7:40	3	7	9	7:41- 7:43 - Drive Thru	1 ORDER TAKER OUTSIDE
	7:45	8	5	8		1 ORDER TAKER OUTSIDE
	7:50	3	7	11		1 ORDER TAKER OUTSIDE
	7:55	4	5	11		1 ORDER TAKER OUTSIDE
	8:00	6	3	6		1 ORDER TAKER OUTSIDE

TOTAL ARRIVAL: **168**

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
SATURDAY, FEBRUARY 23, 2019

WEEKEND MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
AM	11:00	5	2	3		
	11:05	4	1	4		
	11:10	4	3	5		
	11:15	4	2	6		
	11:20	5	2	6		
	11:25	5	3	8		
	11:30	3	1	5		
	11:35	7	0	1		
	11:40	3	2	5		
	11:45	6	3	5		
	11:50	2	5	7		
	11:55	5	2	6		
	12:00	7	4	7		
PM	12:05	5	6	9		2 ORDER TAKERS ARRIVE OUTSIDE
	12:10	3	5	8		2 ORDER TAKERS OUTSIDE
	12:15	2	3	8		1 ORDER TAKER RETURNS INSIDE
	12:20	3	1	4		1 ORDER TAKER OUTSIDE
	12:25	5	1	2		1 ORDER TAKER OUTSIDE
	12:30	5	2	3		1 ORDER TAKER OUTSIDE
	12:35	6	5	8		1 ORDER TAKER OUTSIDE

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
SATURDAY, FEBRUARY 23, 2019

WEEKEND MID-DAY

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	12:40	9	4	8		1 ORDER TAKER OUTSIDE
	12:45	4	5	9		1 ORDER TAKER OUTSIDE
	12:50	5	2	8		1 ORDER TAKER OUTSIDE
	12:55	4	4	7		1 ORDER TAKER OUTSIDE
	1:00	5	3	6		1 ORDER TAKER OUTSIDE
	1:05	5	4	8		1 ORDER TAKER OUTSIDE
	1:10	7	0	4		1 ORDER TAKER OUTSIDE
	1:15	6	1	5		1 ORDER TAKER OUTSIDE
	1:20	8	3	5		1 ORDER TAKER OUTSIDE
	1:25	6	4	10		1 ORDER TAKER OUTSIDE
	1:30	5	4	9		1 ADDITIONAL ORDER TAKER ARRIVES
	1:35	3	4	7		2 ORDER TAKERS OUTSIDE
	1:40	7	0	6		2 ORDER TAKERS OUTSIDE
	1:45	7	3	9		2 ORDER TAKERS OUTSIDE
	1:50	6	3	9		1 ORDER TAKER RETURNS INSIDE
	1:55	6	4	8	1:57 - 1:58 - Drive Thru	1 ADDITIONAL ORDER TAKER ARRIVES
	2:00	4	4	9		2 ORDER TAKERS OUTSIDE

TOTAL ARRIVAL: **186**

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
SATURDAY, FEBRUARY 23, 2019

WEEKEND EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	6:00	6	6	10		1 ORDER TAKER OUTSIDE
	6:05	3	5	10		1 ORDER TAKER OUTSIDE
	6:10	6	4	10		1 ORDER TAKER OUTSIDE
	6:15	5	4	9		1 ORDER TAKER OUTSIDE
	6:20	2	7	12		1 ORDER TAKER OUTSIDE
	6:25	3	2	5		1 ORDER TAKER RETURNS INSIDE
	6:30	5	3	7		
	6:35	1	3	6		
	6:40	4	6	5		
	6:45	4	1	5		
	6:50	4	2	4		
	6:55	4	2	3		
	7:00	6	2	7		
	7:05	6	3	6		
	7:10	4	3	6		
	7:15	2	2	6		

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
SATURDAY, FEBRUARY 23, 2019

WEEKEND EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING	TOTAL #	ORDER BOARD	ENTIRE	STREET	
	TIME	OF CARS	BACK #	DRIVE THRU	OVERFLOW	NOTES
PM	7:20	3	0	4		
	7:25	8	1	3		
	7:30	5	3	7		
	7:35	4	1	4		
	7:40	6	3	5		
	7:45	2	4	6		
	7:50	3	3	5		
	7:55	2	3	7		
	8:00	6	2	5		
	8:05	2	1	4		
	8:10	6	2	6		
	8:15	1	1	4		
	8:20	7	1	4		
	8:25	8	2	5		
	8:30	3	2	8		
	8:35	4	3	8		

VENICE CHICK-fil-A
4050 LINCOLN BLVD
VENICE, CA 90292
SATURDAY, FEBRUARY 23, 2019

WEEKEND EVENING

		ARRIVAL RATE	MAX QUEUE			
	BEGINNING TIME	TOTAL # OF CARS	ORDER BOARD BACK #	ENTIRE DRIVE THRU	STREET OVERFLOW	NOTES
PM	8:40	5	1	5		
	8:45	2	5	7		
	8:50	5	1	4		
	8:55	4	3	5		
	9:00	3	1	5		

TOTAL ARRIVAL: **154**

MEMORANDUM

To:	Ms. Jennifer M. Daw Chick-fil-A, Inc.	Date:	May 20, 2019
From:	Keil D. Maberry, P.E., Principal LLG Engineers	LLG Ref:	2.18.3939.1
Subject:	***Updated On-Site Transportation Circulation & Queuing Management Plan – Chick-fil-A Main Street, Orange***		

As requested, Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following *Updated* On-Site Transportation Circulation and Queuing Management Plan for the proposed Chick-fil-A Main Street Project. The project site is located on the southwest quadrant of Main Street and Almond Avenue in the City of Orange, California. The Project proposes to demolish the existing vacant structure on the site and construct a 4,563 square-foot (SF) Chick-fil-A restaurant with drive-through window with storage for 17 vehicles. Site access for the Project will be provided via one (1) unsignalized, full-access driveway located along Almond Avenue and one (1) unsignalized, right-turn in/right-turn out only driveway located along Main Street (Project Driveway No. 2). As we understand it, City Staff has requested the preparation of an On-Site Circulation and Queuing Management Plan to address the potential for drive-through queueing onto Almond Avenue.

On-Site Transportation Circulation Plan

Based on the drive-through queuing analysis provided in the *Chick-fil-A Main Street Traffic Impact Analysis* (April 10, 2018), prepared by LLG, the following summarizes the On-Site Transportation Circulation Plan to ensure that queuing associated with the drive-through window does not queue onto Almond Avenue.

As presented in *Table 10-2* of the TIA, the maximum queue observed at the five (5) existing Chick-fil-A study sites is ***17 vehicles***, and as shown in ***Figure A***, attached, the drive-through window storage is 17 vehicles, which indicates that the drive-through vehicle queue will not likely exceed the storage at any instance throughout the day. However as also shown in *Figure A*, there is adequate area on-site to accommodate at least three (3), and as many as 10 additional vehicles, without impacting on-site circulation. It should be noted that the east-west drive aisle along the front of the restaurant is not considered a Fire Lane, so queuing within the drive aisle is acceptable.

Furthermore, Chick-fil-A staff will implement the following program, on an as-needed basis during their peak operating times, to further ensure that vehicles will not queue back onto the public streets. The program consists of the following as provided by Chick-fil-A management staff:

LINSCOTT LAW & GREENSPAN engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers
2 Executive Circle
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Irvine, CA 92614
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Pasadena
Irvine
San Diego
Woodland Hills

Philip M. Linscott, PE (1924-2000)
Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

An LG2WB Company Founded 1966

- "Our restaurants are staffed so that if the drive-thru queuing begins stacking beyond the drive-through lane, team members go out and assist with ordering via Chick-fil-A's iPad ordering system. Our operators use the iPad ordering during our peak hours of 11:30 am to 1:30 pm and any additional time when needed. In addition, team members will monitor the Almond Street access and direct traffic, accordingly, to ensure that any vehicle queueing beyond the drive-through lane will not block vehicular circulation within the parking lot. The iPad ordering system allows team members to take orders, receive payment, and assist with traffic movement within the parking lot. Based on data from our other comparable stores, the iPad ordering system increases the CFA drive thru speed of service by 30% than the typical speaker box. Putting people forward in the drive-through is one of our biggest competitive advantages in the market because it personally connects our team members with our valued guest. We want to continue this momentum by building a platform to supporting current and future innovations that increase capacity and put our people forward to care for our guest in every interaction. Our customers enjoy the face to face ordering over the standard drive-thru experience."
- While extremely unlikely based on the Supplemental Queuing Analysis (LLG), dated May 10, 2019, should the drive-through queue extend onto Almond Avenue, Chick-fil-A staff will direct the customer to utilize the Main Street access to enter the drive-through lane. Chick-fil-A management will also direct staff to park in the stalls closest to the drive-through entrance along Almond Avenue. This will allow stacking, if needed, to occur without affecting public customers.

Queuing Management Plan

As stated above, Chick-fil-A will utilize the iPad ordering system to manage queuing, which will consist of two employees with iPads to take orders, receive payment, and assist with traffic movement within the parking lot. While this has been sufficient in their experience with other Chick-fil-A restaurants to manage queuing, on-site Chick-fil-A Staff will closely monitor and dispense another iPad-equipped employee or employees, as needed, to assist in the queuing management process whenever the drive-through queue extends beyond 17 vehicles and/or approaches the Almond Avenue Project driveway. The additional employee(s) will direct traffic to ensure that any queuing vehicles will not restrict circulation throughout the site and at the Project driveways, such as directing customers to utilize the Main Street access should the drive-through queue extend onto Almond Avenue.

It should be noted that given the number of Chick-fil-A restaurants in the region and particularly now a second restaurant in the City of Orange, the likelihood of significant congestion and/or overcrowding of parking at this Chick-fil-A restaurant is

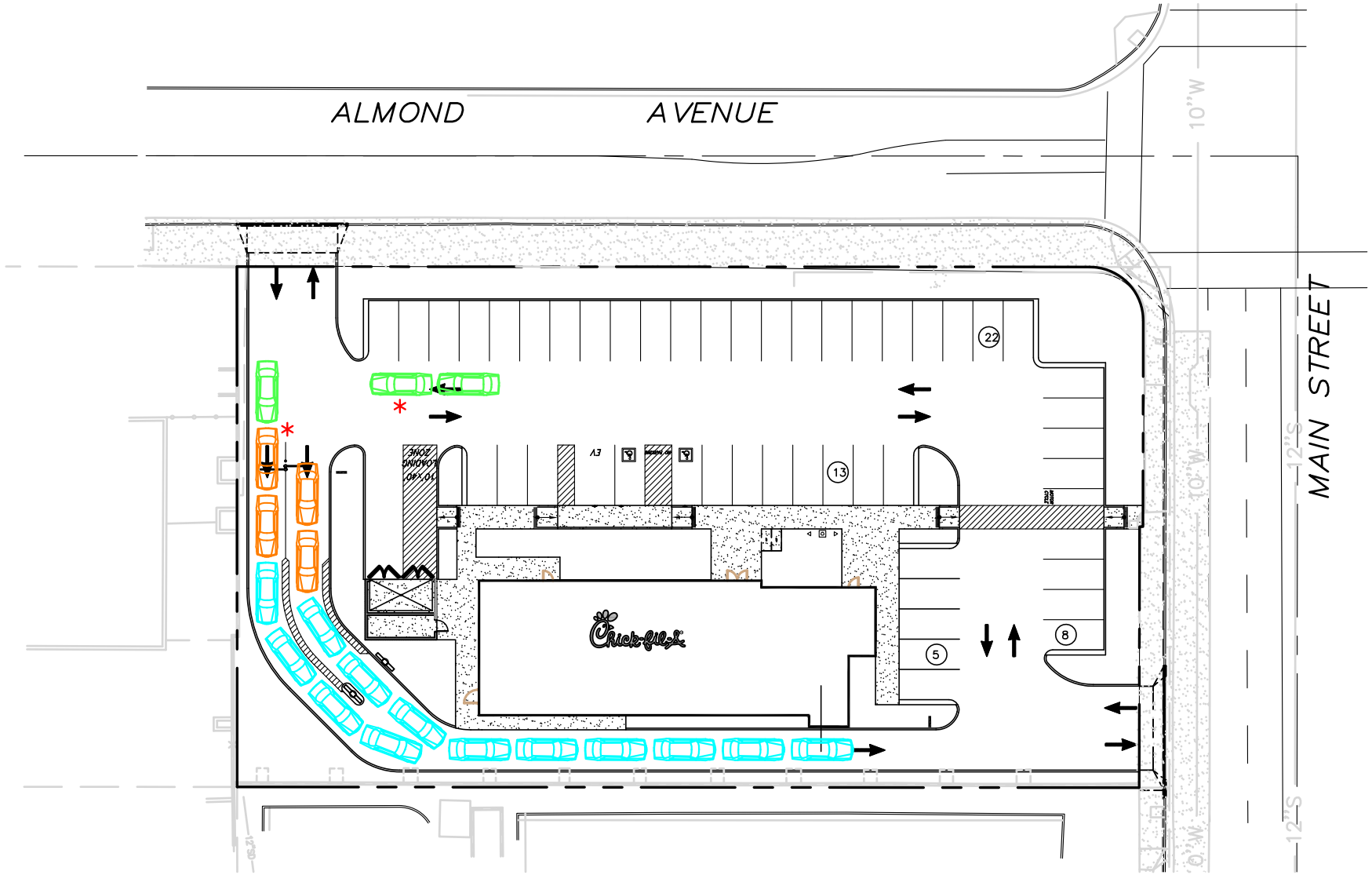
LINSCOTT LAW & GREENSPAN engineers

lessened. Furthermore, the advancement of technology within the business, and in particular mobile orders, reduces the demand for drive-through orders.

* * * * * * * * * *

We appreciate the opportunity to provide this Updated On-Site Transportation Circulation and Queuing Management Plan. Please contact us at (949) 825-6175 if you have any questions.

Attachment



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: CRHO ARCHITECTS

KEY

* = IPAD ATTENDANTS

= 85TH PERCENTILE QUEUE (13)

= MAXIMUM QUEUE (17)

= OVERFLOW QUEUE (20+)

FIGURE A

CIRCULATION PLAN

CHICK-FIL-A MAIN STREET, ORANGE

LINSCOTT LAW & GREENSPAN engineers

TRAFFIC IMPACT ANALYSIS

CHICK-FIL-A MAIN STREET PROJECT

Orange, California
April 10, 2018

Prepared for:

CHICK-FIL-A, INC.
15635 Alton Parkway, Suite 350
Irvine, CA 92618

LLG Ref. 2-18-3939-1

REGISTERED PROFESSIONAL ENGINEER
DANIEL A. KLOOS
No. 2200
Exp. 9-30-19
TRAFFIC
STATE OF CALIFORNIA

Prepared by:
Daniel A. Kloos, P.E.
Senior Transportation Engineer
and
Justin Tucker
Transportation Engineer I

Under the Supervision of:
Keil D. Maberry, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
KEIL D. MABERRY, P.E.
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TRAFFIC IMPACT ANALYSIS

CHICK-FIL-A MAIN STREET PROJECT

Orange, California
April 10, 2018

1.0 INTRODUCTION

This traffic impact analysis addresses the potential traffic impacts and circulation needs associated with the proposed Chick-fil-A Main Street Project (hereinafter referred to as Project). The Project proposes to demolish the existing vacant structure on the site and construct a 4,563 square-foot (SF) Chick-fil-A restaurant with drive-through window. A total of 48 parking spaces will be provided on site. The Project site is generally located on the southwest quadrant of Main Street and Almond Avenue in the City of Orange, California.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts associated with the Project. The traffic analysis evaluates the existing operating conditions at five (5) key study intersections and four (4) key roadway segments within the project vicinity, estimates the trip generation potential of the Project, and forecasts future operating conditions without and with the proposed Project. Where necessary, intersection improvements/mitigation measures are identified.

This traffic report satisfies the *City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007,* and is consistent with the requirements and procedures outlined in the most current *Congestion Management Program (CMP) for Orange County*. The Scope of Work for this traffic study, which is included in ***Appendix A***, was developed in conjunction with City of Orange Traffic Engineering staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic information has been collected at five (5) key study intersections and four (4) key roadway segments on a "typical" weekday for use in the preparation of intersection and roadway segment level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Orange. Based on our research, there are eleven (11) cumulative projects in the City of Orange within the vicinity of the subject site. These eleven (11) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour traffic conditions for a near-term (Year 2020) traffic setting upon completion of the proposed Project. Daily and peak hour traffic forecasts for the Year 2020 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of one percent (1.0%) per year and adding traffic volumes generated by eleven (11) cumulative projects.

1.1 Study Area

The five (5) key study intersections and four (4) key roadway segments selected for evaluation were determined based on coordination with City of Orange Traffic Engineering staff and application of the "51 or more peak hour trip threshold" criteria outlined in the *City of Orange Traffic Impact Analysis Guidelines*, dated August 15, 2007. The intersections and roadway segments listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. It should be noted that each key study intersection and roadway segment is located within the City of Orange.

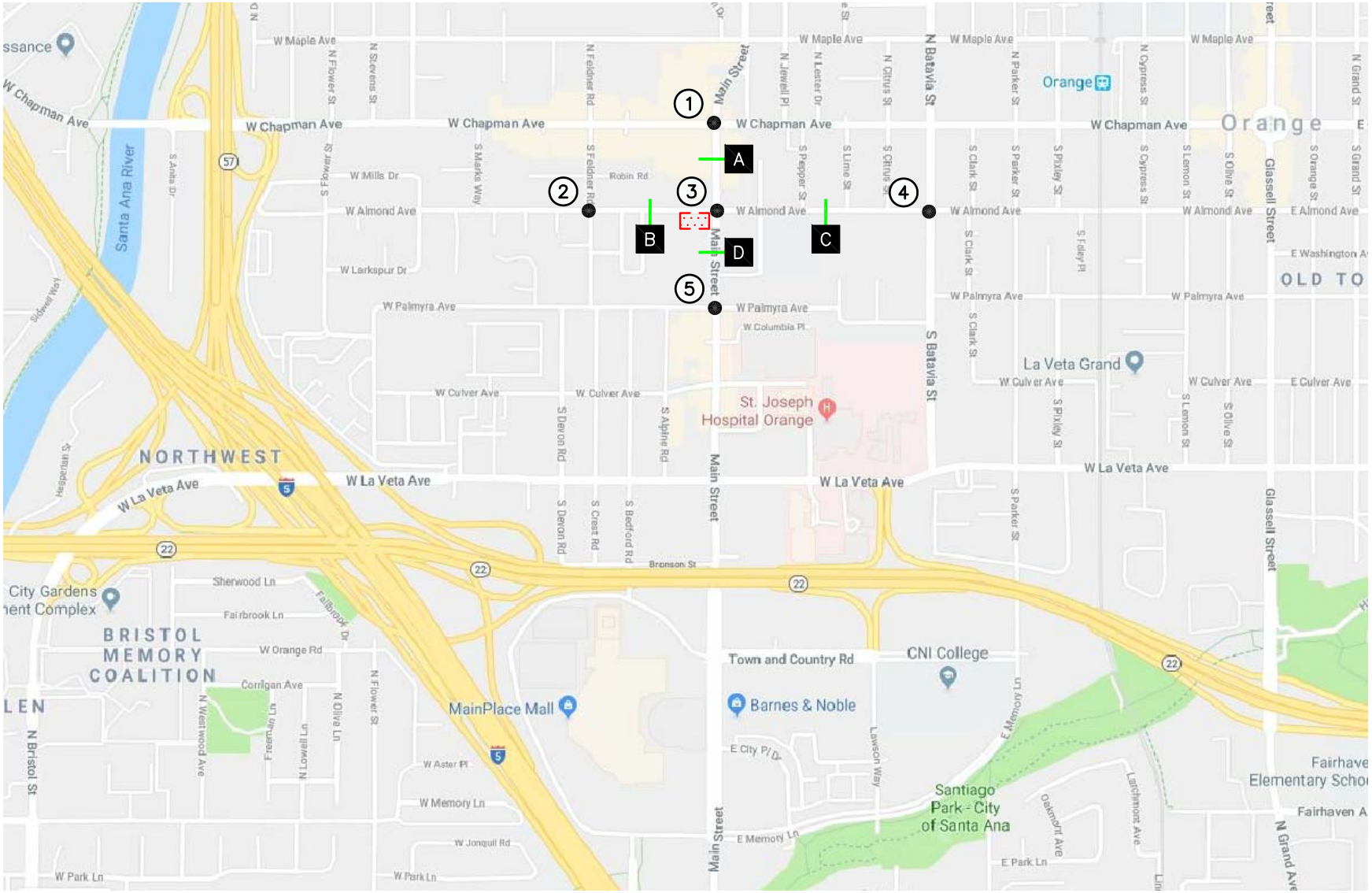
Key Study Intersections
1. Main Street at Chapman Avenue
2. Feldner Road at Almond Avenue
3. Main Street at Almond Avenue
4. Batavia Street at Almond Avenue
5. Main Street at Palmyra Avenue

Key Roadway Segments
A. Main Street, between Chapman Avenue and Almond Avenue
B. Almond Avenue, between Feldner Road and Main Street
C. Almond Avenue, between Main Street and Batavia Street
D. Main Street, between Almond Avenue and Palmyra Avenue

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway segment improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or mitigate the impact of the project.

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Daily, AM and PM peak hour capacity analyses for existing conditions,
- Daily, AM and PM peak hour capacity analyses for existing plus project conditions,
- Daily, AM and PM peak hour capacity analyses for future (Year 2020) conditions without and with project traffic,
- Site Access and Internal Circulation Evaluation,
- Drive-Through Queuing Analysis
- Recommended Improvements, and
- Congestion Management Program (CMP) Analysis.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

A = STUDY ROADWAY SEGMENT

= PROJECT SITE

FIGURE 1-1

VICINITY MAP

CHICK-FIL-A MAIN STREET, ORANGE

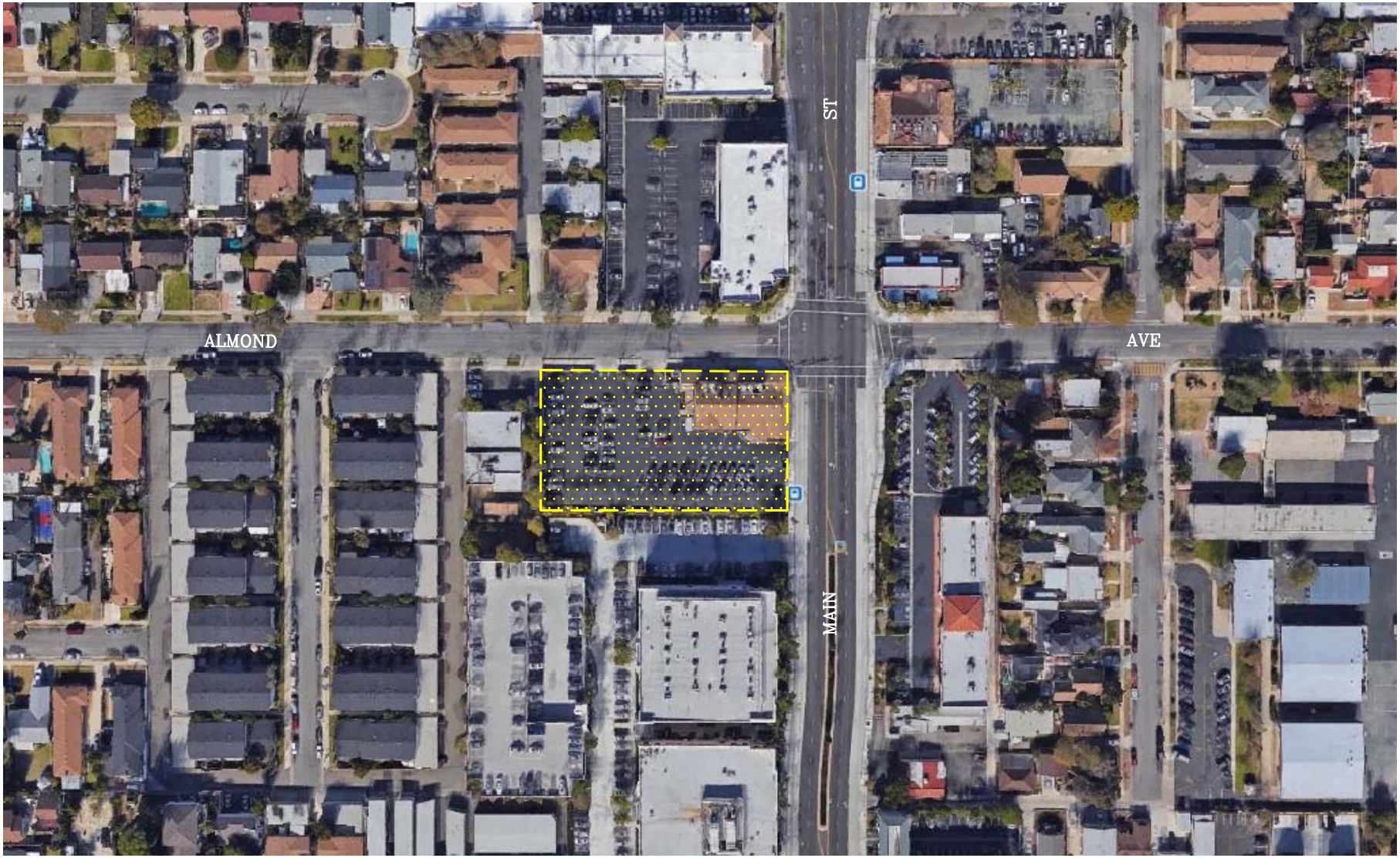
2.0 PROJECT DESCRIPTION

The Project site is generally located on the southwest quadrant of Main Street and Almond Avenue in the City of Orange, California. ***Figure 2-1*** presents an aerial depiction of the existing site, which shows the existing vacant restaurant building to be demolished.

Figure 2-2 presents the proposed site plan for the proposed Project, prepared by CRHO Architects. Review of the proposed site plan indicates that the proposed Project will consist of a 4,563 SF Chick-fil-A restaurant with drive-through window and drive-through queue storage of 17 vehicles. A total of 48 parking spaces will be provided on site and parking is restricted along both the Main Street and Almond Avenue Project frontages. The proposed Project is expected to be constructed and fully occupied by the Year 2020.

2.1 Site Access

As shown in *Figure 2-2*, access to the Project site will be provided via one (1) unsignalized, full-access driveway located along Almond Avenue (Project Driveway No. 1) and one (1) unsignalized, right-turn in/right-turn out only driveway located along Main Street (Project Driveway No. 2).



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

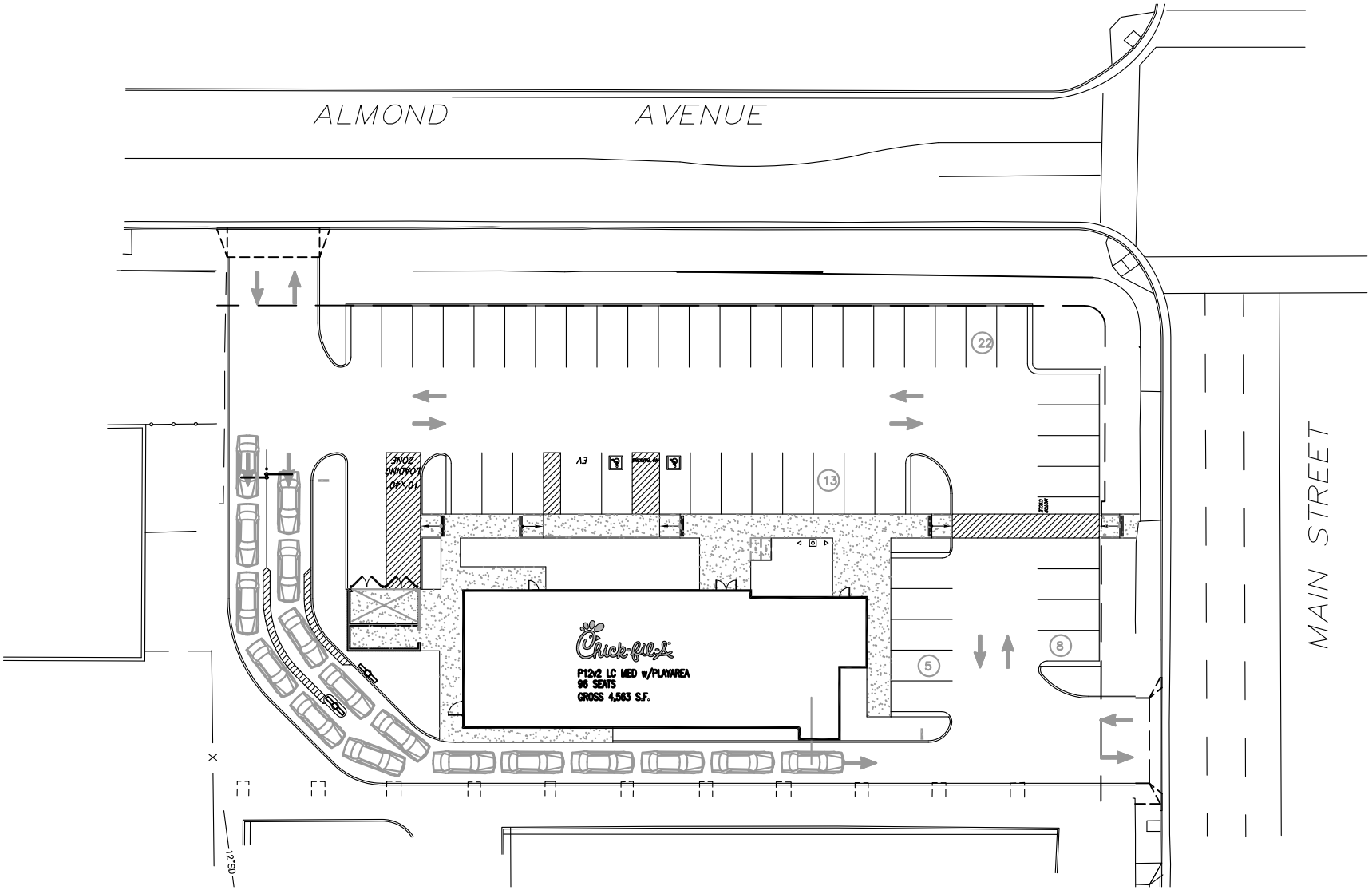
KEY

= PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL

CHICK-FIL-A MAIN STREET, ORANGE



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SOURCE: CRHO ARCHITECTS

FIGURE 2-2

PROPOSED SITE PLAN

CHICK-FIL-A MAIN STREET, ORANGE

3.0 EXISTING CONDITIONS

3.1 Existing Street System

Regional access to the site is provided via the Santa Ana (I-5) Freeway, the Orange (SR-57) Freeway, and the Garden Grove (SR-22) Freeway. The principal local network of streets serving the proposed Project includes Chapman Avenue, Main Street and Almond Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Chapman Avenue is generally a six-lane, divided roadway west of Main Street, and generally a four-lane, divided roadway east of Main Street, oriented in the east-west direction. On-street parking is generally not permitted along this roadway within the vicinity of the project. The posted speed limit on Chapman Avenue is 40 miles per hour (mph). Traffic signals control the study intersections of Chapman Avenue at Main Street, Almond Avenue and Palmyra Avenue.

Main Street is generally a four-lane, divided roadway north of Chapman Avenue and generally a six-lane, divided roadway south of Chapman Avenue, oriented in the north-south direction. Main Street borders the project site to the east and will provide access to the site via one (1) unsignalized, right-turn in/right-turn out only driveway. On-street parking is generally not permitted along this roadway within the vicinity of the project. The posted speed limit on Main Street is 35 mph north of Chapman Avenue and 40 mph south of Chapman Avenue. An OCTA bus stop is located along the west side of Main Street immediately south of the Project site.

Almond Avenue is generally a two-lane, undivided roadway, oriented in the east-west direction. Almond Avenue borders the Project site to the north and will provide access to the site via one (1) unsignalized, full-access driveway. On-street parking is not permitted along both sides of this roadway along project frontage. However, parking is generally permitted along the remainder of Almond Avenue within the vicinity of the Project. The posted speed limit on Almond Avenue is 30 mph west of Main Street and 25 mph east of Main Street. A traffic signal controls the study intersection of Almond Avenue at Main Street.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.

3.2 Existing Traffic Volumes

Five (5) key study intersections and four (4) key roadway segments have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections/roadway segments, and their analysis will reveal the expected relative impacts of the project. These key intersections and roadway segments were selected for evaluation based on coordination with City of Orange Traffic Engineering staff and application of the "51 or more peak hour trip threshold" criteria outlined in the *City of Orange Traffic Impact Analysis Guidelines*, dated August 15, 2007.

Existing daily, AM peak hour, and PM peak hour traffic volumes for the five (5) key study intersections and four (4) key roadway segments evaluated in this report were conducted by Transportation Studies Inc. in March 2018. ***Figures 3-2*** and ***3-3*** illustrate the existing AM and PM peak hour traffic volumes at the five (5) key study intersections. *Figure 3-3* also presents the existing average daily traffic volumes for the four (4) key roadway segments in the vicinity of the proposed Project.

Appendix B contains the detailed peak hour count sheets for the key intersections evaluated in this report. *Appendix B* also contains the average daily traffic volumes for the key roadway segments.

3.3 Existing Intersection Conditions

Existing AM and PM peak hour operating conditions for the five (5) key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the methodology outlined in *Chapter 20 of the HCM 6* for two-way stop-controlled intersections, and the methodology outlined in *Chapter 21 of the HCM 6* for all-way stop-controlled intersections.

3.3.1 Intersection Capacity Utilization (ICU) Method of Analysis (Signalized Intersections)

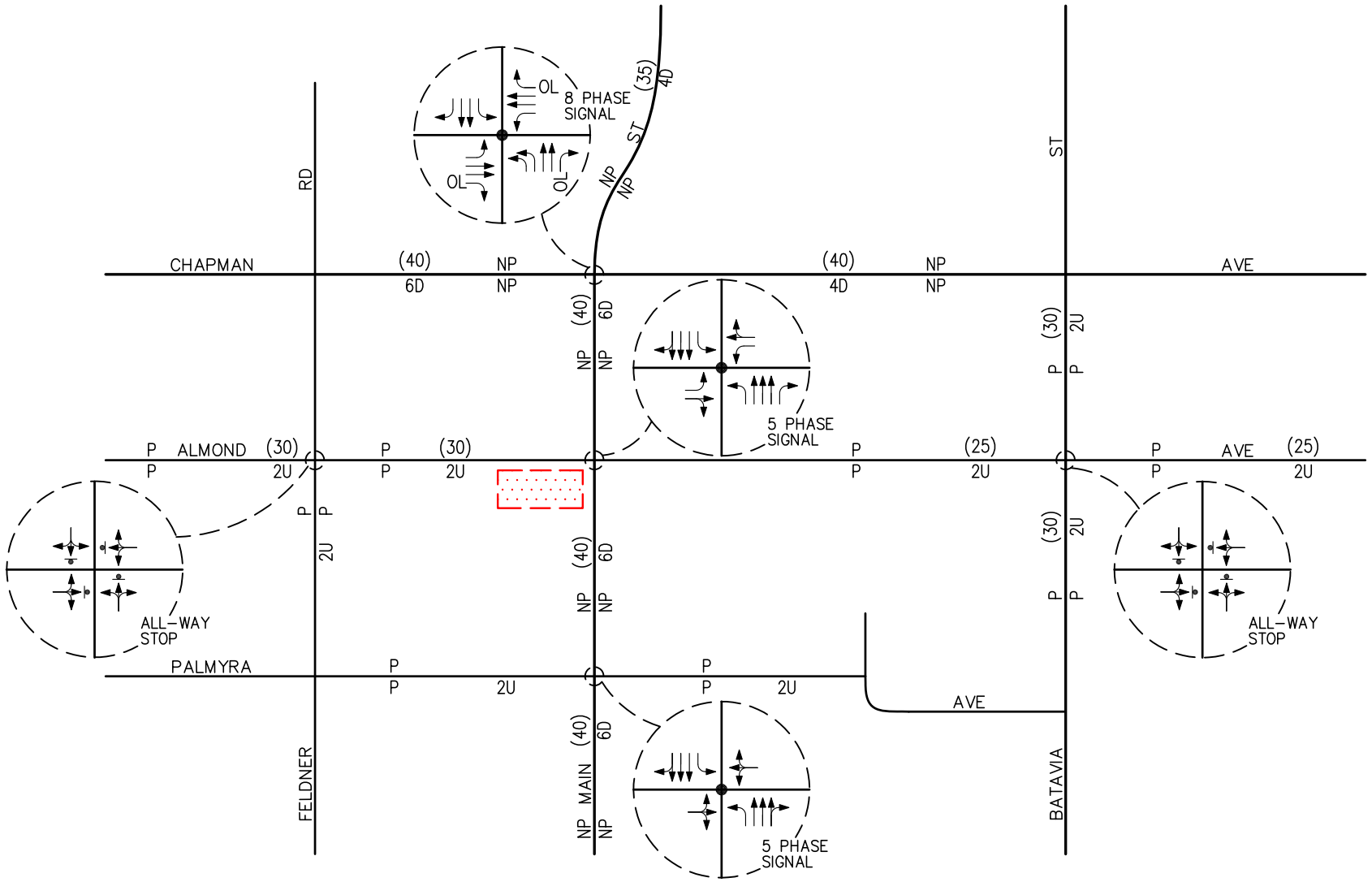
In conformance with City of Orange requirements, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per City of Orange requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***.

3.3.2 Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable, which can reduce users' delay tolerance.



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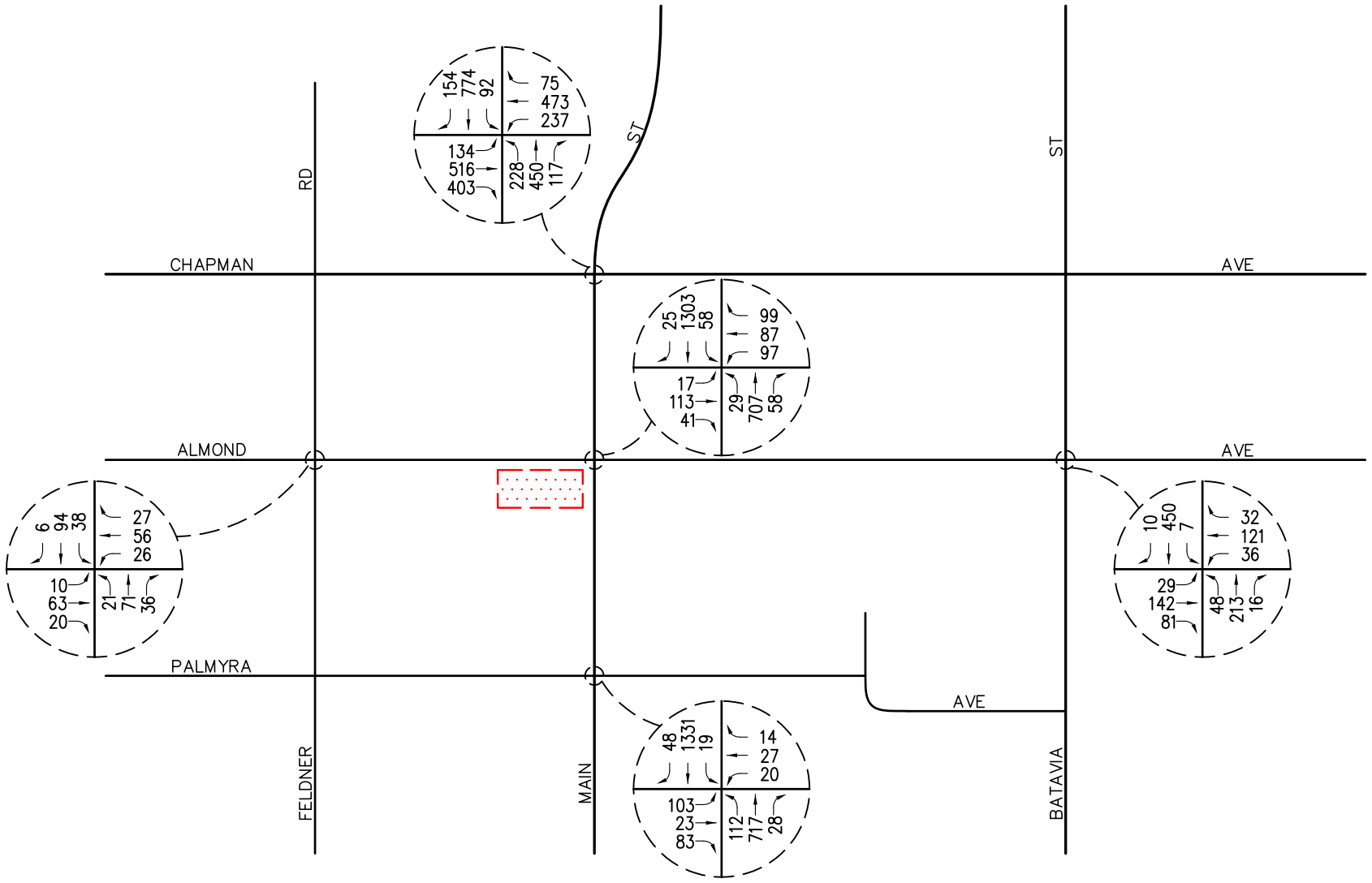
KEY

- ← = APPROACH LANE ASSIGNMENT
- ● = TRAFFIC SIGNAL, ⊸ = STOP SIGN
- OL = OVERLAP
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- (XX) = POSTED SPEED LIMIT (MPH)
- ⬚ = PROJECT SITE

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

CHICK-FIL-A MAIN STREET, ORANGE



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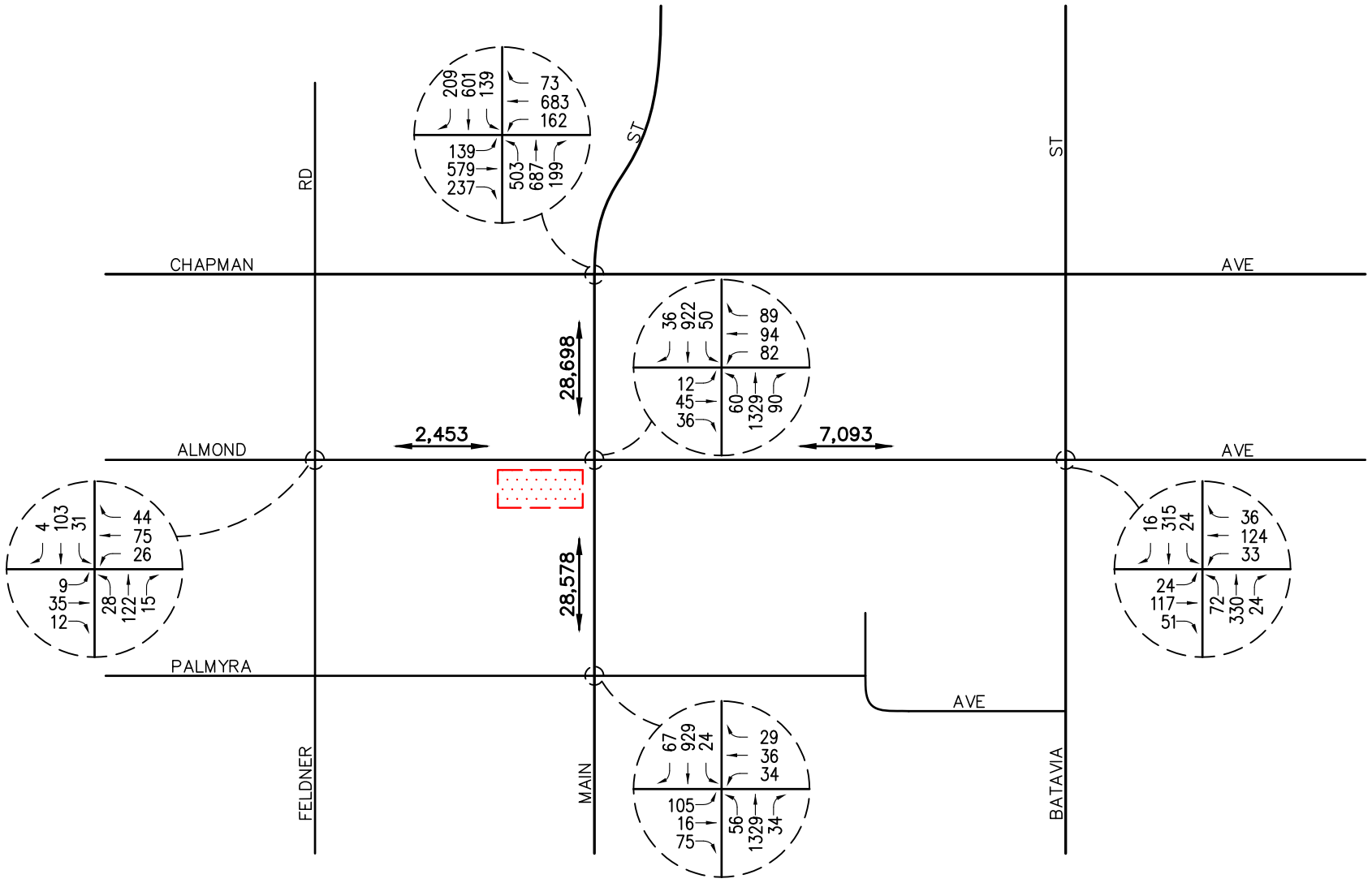
KEY

= PROJECT SITE

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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KEY

XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 3-3

EXISTING PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE

3.3.2.1 *Two-Way Stop-Controlled Intersections*

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 3-2***.

3.3.2.2 *All-Way Stop-Controlled Intersections*

All-way stop-controlled intersections require every vehicle to stop at the intersection before proceeding. Because each driver must stop, the decision to proceed into the intersection is a function of traffic conditions on the other approaches. The time between subsequent vehicle departures depends on the degree of conflict that results between the vehicles and vehicles on the other approaches. This methodology determines the control delay for each lane on the approach, computes a weighted average for the whole approach, and computes a weighted average for the intersection as a whole. Level of service (LOS) at the approach and intersection levels is based solely on control delay. The HCM control delay value range for all-way stop-controlled intersections is shown in *Table 3-2*.

3.4 Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)

Existing daily operating conditions for the four (4) key roadway segments have been investigated according to the daily volume-to-capacity (V/C) ratio of each link. The daily V/C relationship is used to estimate the LOS of the roadway segment with the volume based on the 24-hour traffic count data and the capacity based on the City of Orange General Plan Circulation and Mobility Element street classifications. The roadway link capacity of each street classification according to the City of Orange General Plan Circulation and Mobility Element is presented in ***Table 3-3***, along with the six corresponding service levels and associated V/C ratios.

3.5 Level of Service Criteria

According to the City of Orange General Plan Circulation Element and stated in the *City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007*, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections and LOS D is the minimum acceptable condition that should be maintained on a daily basis on all roadway segments.

3.6 Existing Level of Service Results

3.6.1 Intersections

Table 3-4 summarizes the existing peak hour service level calculations for the five (5) key study intersections based on existing traffic volumes and current street geometry. Review of *Table 3-4* indicates that all five (5) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

Appendix C presents the ICU/LOS and HCM/LOS calculations for the five (5) key study intersections for the AM peak hour and PM peak hour.

3.6.2 Roadway Segments

Table 3-5 summarizes the existing service level calculations for the four (4) key roadway segments based on existing 24-hour traffic volumes and current roadway geometry. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) shows the daily volume, V/C ratio and resulting level of service. Review of *Table 3-5* indicates that all four (4) key roadway segments currently operate at acceptable LOS A on a daily basis.

TABLE 3-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[1]

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.60	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.61 – 0.70	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 – 0.80	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.81 – 0.90	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.91 – 1.00	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

[1] Source: *Transportation Research Board Circular 212 – Interim Materials on Highway Capacity*.

TABLE 3-2

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[2,3]

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

2 Source: *Highway Capacity Manual 6*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

3 Source: *Highway Capacity Manual 6*, Chapter 21: All-Way Stop-Controlled Intersections. For approaches and intersection-wide assessment, LOS is defined solely by control delay.

TABLE 3-3

ROADWAY LINK CAPACITIES

Facility Type	Number of Lanes	Level of Service Criteria With Associated Roadway Capacity					
		Daily Values (VPD)					
		Level of Service (LOS)					
		A	B	C	D	E[4]	F
Principal	8-lanes divided	45,000	52,500	60,000	67,500	75,000	--
Major	6-lanes divided	33,900	39,400	45,000	50,600	56,300	--
Primary	4-lanes divided	22,500	26,300	30,000	33,800	37,500	--
Secondary	4-lanes undivided	14,400	16,800	19,200	21,600	24,000	--
Collector	2-lanes undivided	7,200	8,400	9,600	10,800	12,000	--
V/C Ratio		≤ 0.60	0.61-0.70	0.71-0.80	0.81-0.90	0.91-1.00	≥ 1.00

Notes:

- VPD = vehicles per day
- VPH = vehicles per hour

[4] Source: City of Orange General Plan; Circulation and Mobility.

TABLE 3-4

EXISTING PEAK HOUR LEVELS OF SERVICE

Key Intersection	Time Period	Jurisdiction	Minimum Acceptable LOS	Control Type	ICU/HCM	LOS
1. Main Street at Chapman Avenue	AM	Orange	D	8 Phase	0.654	B
	PM			Signal	0.657	B
2. Feldner Road at Almond Avenue	AM	Orange	D	All-Way	8.4 s/v	A
	PM			Stop	8.6 s/v	A
3. Main Street at Almond Avenue	AM	Orange	D	5 Phase	0.475	A
	PM			Signal	0.455	A
4. Batavia Street at Almond Avenue	AM	Orange	D	All-Way	20.0 s/v	C
	PM			Stop	18.0 s/v	C
5. Main Street at Palmyra Avenue	AM	Orange	D	5 Phase	0.521	A
	PM			Signal	0.467	A

Notes:

- s/v = seconds per vehicle (delay)
- **BOLD ICU/LOS** and **HCM/LOS** values indicate unacceptable service level

TABLE 3-5

EXISTING ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acc. LOS	(1) No. of Existing Lanes	(2) Arterial Classification	(3) Existing Capacity at LOS "E"	(4) Existing Traffic Conditions		
						Daily Volume	V/C Ratio	LOS
A. Main Street between Chapman Ave and Almond Ave	Orange	D	6D	Major	56,300	28,698	0.510	A
B. Almond Avenue between Feldner Road and Main Street	Orange	D	2U	Collector	12,000	2,453	0.204	A
C. Almond Avenue between Main Street and Batavia Street	Orange	D	2U	Collector	12,000	7,093	0.591	A
D. Main Street between Almond Ave and Palmyra Ave	Orange	D	6D	Major	56,300	28,578	0.508	A

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed Project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and also presents the Project's forecast peak hour and daily traffic volumes. As shown, the trip generation potential of the Project was estimated using ITE Land Use 934: Fast-Food Restaurant With Drive-Through trip rates. Review of *Table 5-1* indicates that the proposed Project is forecast to generate 1,612 daily trips, with 93 trips (47 inbound, 46 outbound) produced in the AM peak hour and 74 trips (38 inbound, 36 outbound) produced in the PM peak hour on a "typical" weekday.

Please note that the aforementioned overall project trip generation includes adjustments for pass-by per the *Trip Generation Handbook, 3rd Edition,* published by ITE (2014), to account for trips that are already in the everyday traffic stream on the adjoining streets (i.e. Main Street and Almond Avenue) and will stop as they pass by the project site as a matter of convenience on their path to another destination. Per the *Trip Generation Handbook*, a pass-by reduction factor of 49% and 50% is recommended for the AM and PM peak hours, respectively for fast-food restaurants with drive-through land uses. The daily pass-by percentage was estimated to be 25%.

5.2 Project Traffic Distribution and Assignment

Figure 5-1 illustrates the general, directional traffic distribution pattern for the proposed Project. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- directional flows on the freeways in the immediate vicinity of the project site (i.e. I-5 Freeway, SR-57 Freeway, and SR-22 Freeway),
- the site's proximity to major traffic carriers (i.e. Chapman Avenue, Main Street, etc.),
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals, and
- ingress/egress availability at the project site.

The anticipated AM and PM peak hour project traffic volumes associated with the Project are presented in ***Figures 5-2*** and ***5-3***, respectively. *Figure 5-3* also presents the daily project traffic volumes for the Project. The traffic volume assignments presented in *Figures 5-2* and *5-3* reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-1*.

5.3 Existing Plus Project Traffic Conditions

The existing plus project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared pursuant to the California Environmental Quality Act (CEQA) guidelines, which require that the potential impacts of a Project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

Figures 5-4 and ***5-5*** present projected AM and PM peak hour traffic volumes at the five (5) key study intersections and two (2) Project driveways with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively. *Figure 5-5* also presents the existing plus project daily traffic volumes.

TABLE 5-1

PROJECT TRAFFIC GENERATION FORECAST[5]

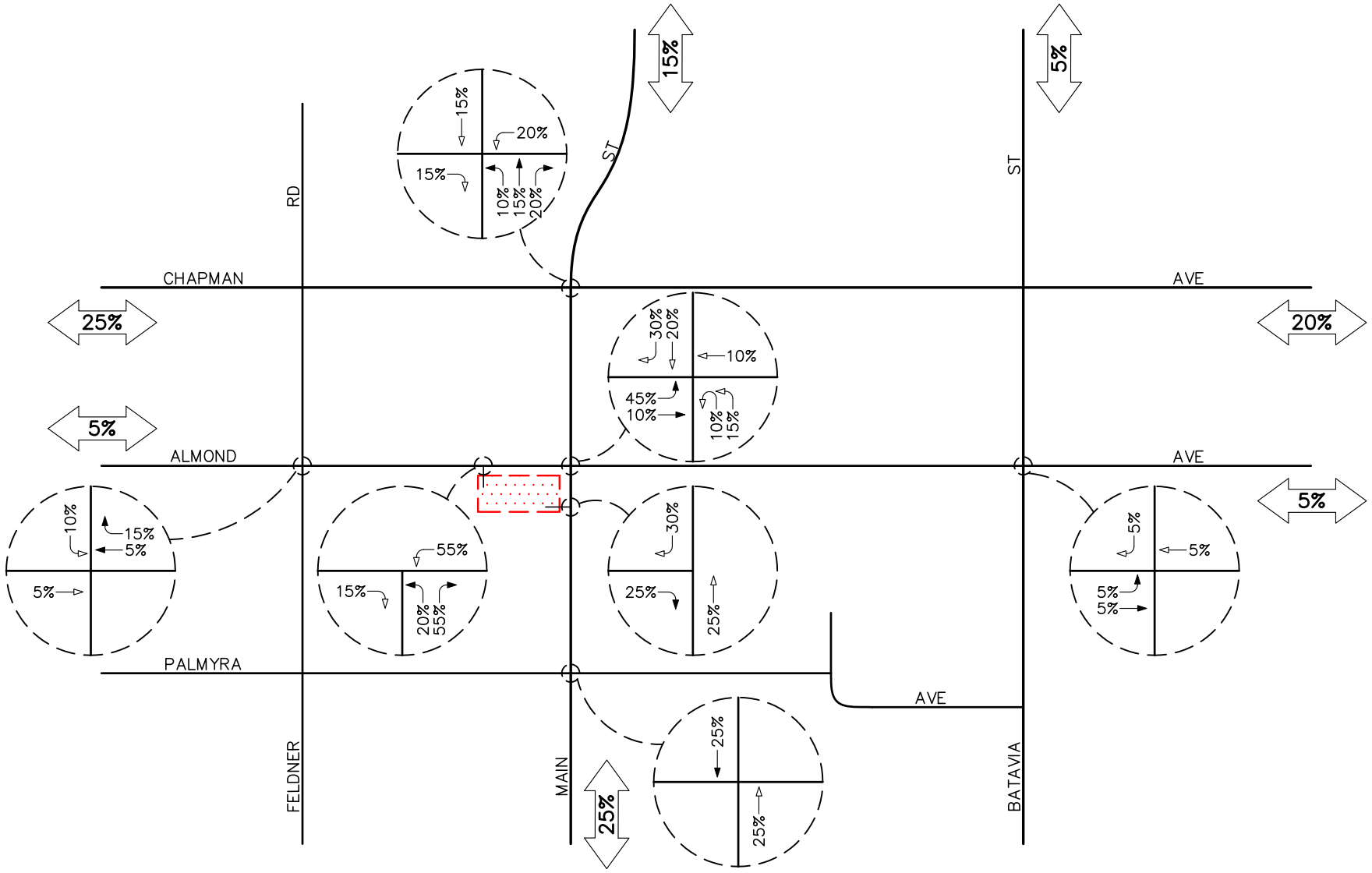
ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Factors:							
▪ 934: Fast-Food Restaurant With Drive-Thru (TE/1000 SF)	470.95	20.50	19.69	40.19	16.99	15.68	32.67
Generation Forecast:							
▪ Chick-fil-A Restaurant With Drive-Thru (4,563 SF)	2,149	93	90	183	77	72	149
Pass-By (Daily: 25%, AM: 49%, PM: 50%)[6]	-537	-46	-44	-90	-39	-36	-75
Subtotal	1,612	47	46	93	38	36	74
Total Traffic Generation Forecast	***1,612***	***47***	***46***	***93***	***38***	***36***	***74***

Note:

- TE/1000 SF = trip end per thousand square feet

5 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

6 Source: *Trip Generation Handbook, 3rd Edition*, published by ITE (2014).



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N NO SCALE

KEY

= INBOUND PERCENTAGE

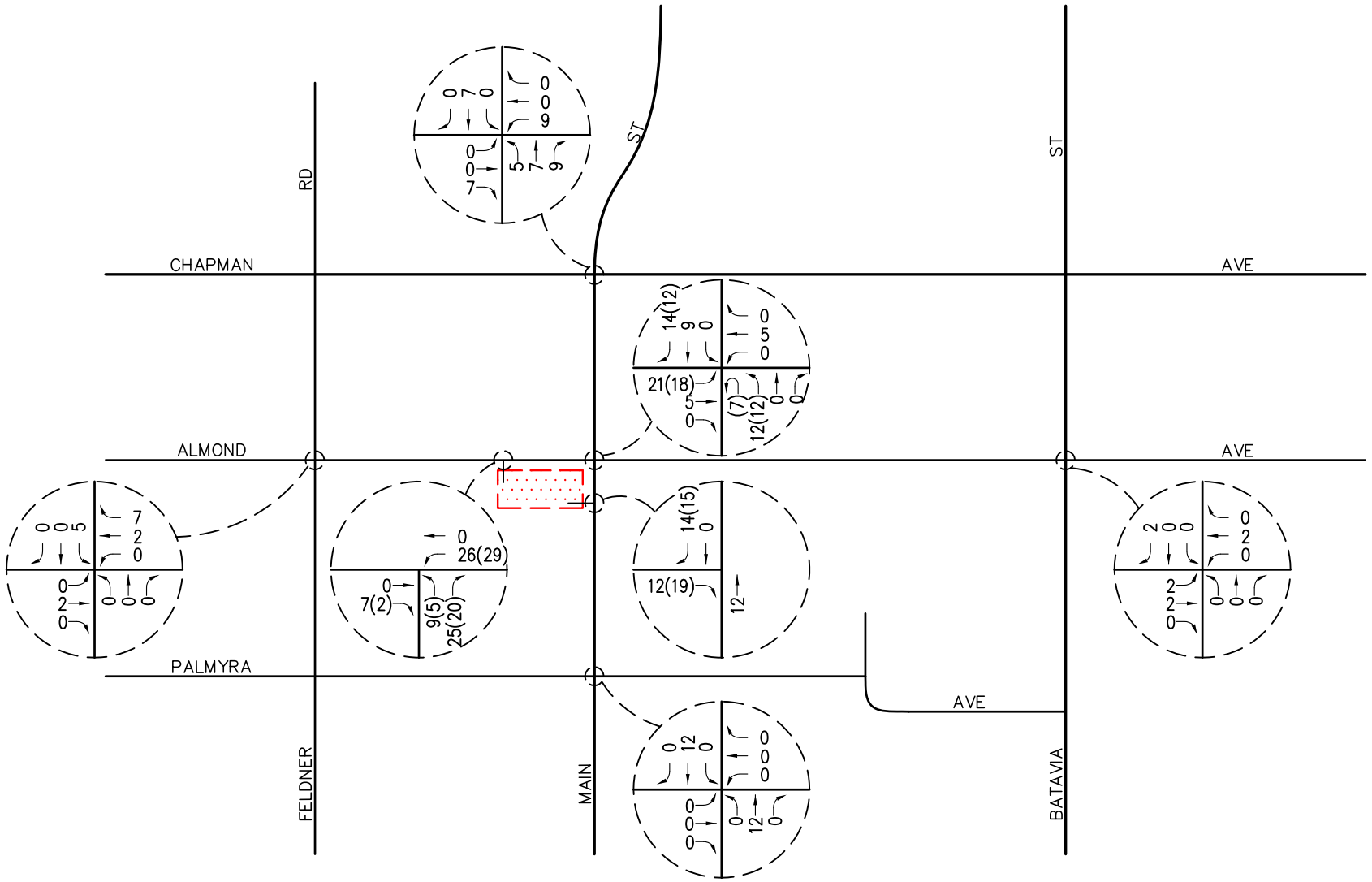
= OUTBOUND PERCENTAGE

= PROJECT SITE

FIGURE 5-1

PROJECT TRAFFIC DISTRIBUTION PATTERN

CHICK-FIL-A MAIN STREET, ORANGE



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N NO SCALE

KEY

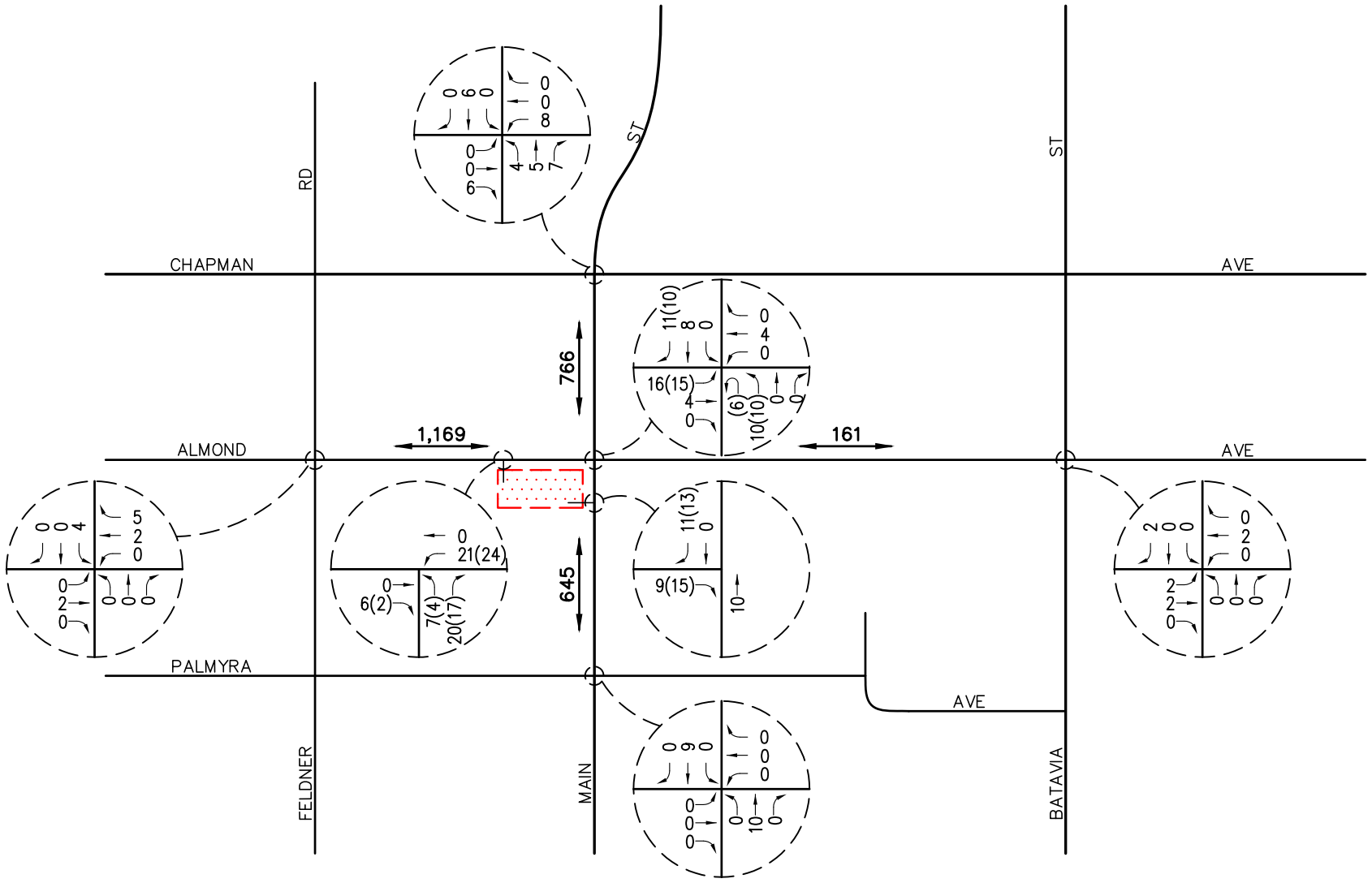
XX(XX) = PROJECT TRIPS (PASS-BY TRIPS)

= PROJECT SITE

FIGURE 5-2

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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N NO SCALE

KEY

XX(XX) = PROJECT TRIPS (PASS-BY TRIPS)

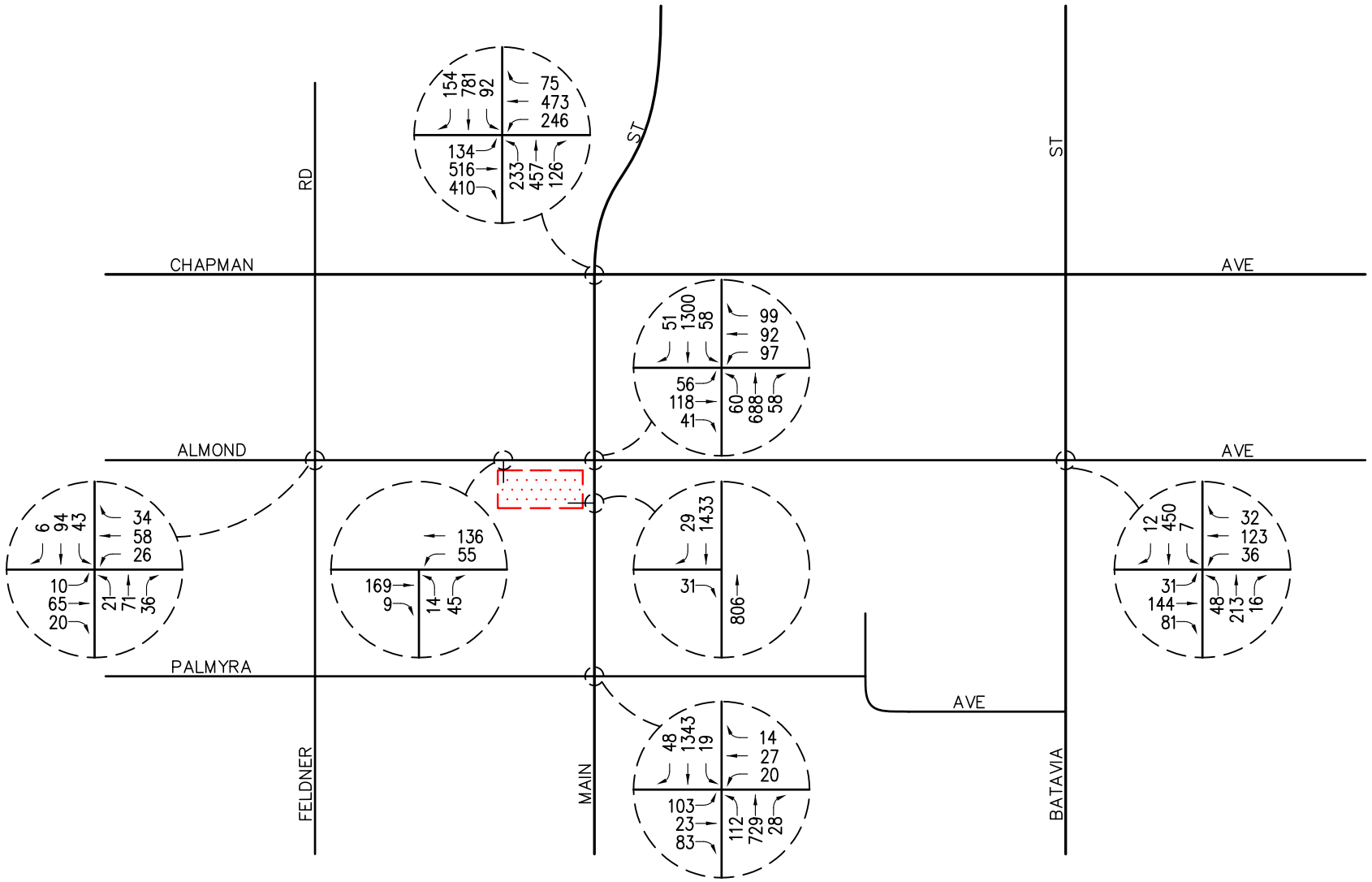
XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 5-3

PM PEAK HOUR AND DAILY PROJECT TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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N NO SCALE

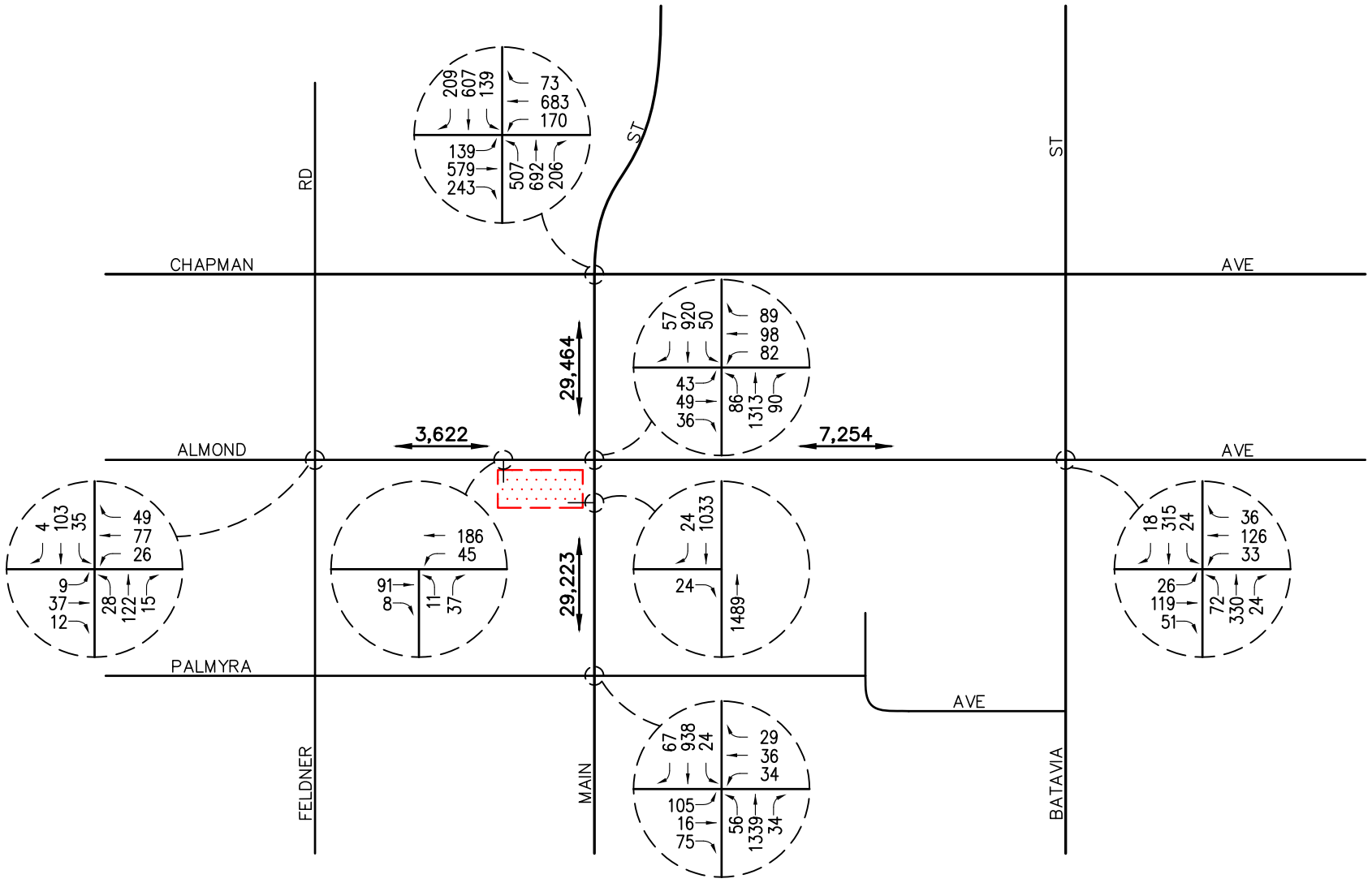
KEY

= PROJECT SITE

FIGURE 5-4

EXISTING PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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N NO SCALE

KEY

XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 5-5

EXISTING PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2018 existing traffic volumes, this factor results in a 2.0% growth in existing volumes to the near-term horizon year 2020.

6.2 Cumulative Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (cumulative projects) in the vicinity of the proposed Project has been researched at the City of Orange. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development.

Based on our research, there are eleven (11) cumulative projects in the City of Orange within the vicinity of the subject site that have either been built, but not yet fully occupied, or are being processed for approval. These eleven (11) cumulative projects have been included as part of the cumulative background setting.

Table 6-1 provides a brief description for each of the eleven (11) cumulative projects. ***Figure 6-1*** graphically illustrates the location of the cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections and/or roadway segments.

Table 6-2 presents the trip generation for the eleven (11) cumulative projects. As shown in *Table 6-2*, the eleven (11) cumulative projects are forecast to generate a total of 16,634 daily trips, with 1,076 trips (133 inbound and 943 outbound) forecast during the AM peak hour and 1,321 trips (945 inbound and 376 outbound) forecast during the PM peak hour.

6.3 Year 2020 Traffic Volumes

The AM and PM peak hour traffic volumes associated with the eleven (11) cumulative projects are presented in ***Figures 6-2*** and ***6-3***, respectively. *Figure 6-3* also presents the daily cumulative project traffic volumes.

Figures 6-4 and ***6-5*** present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth traffic + cumulative project traffic) at the five (5) key study intersections for the Year 2020, respectively. *Figure 6-5* also presents the Year 2020 daily cumulative traffic volumes.

Figures 6-6 and ***6-7*** illustrate the Year 2020 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figure 6-7* also presents the Year 2020 daily cumulative plus project traffic volumes.

TABLE 6-1

LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[7]

No.	Description	Location/Address	Size
City of Orange			
1.	3800 Chapman Apartments	3800 Chapman Avenue	280 DU Apartments
2.	Orange Art of Dentistry	2006 West Chapman Avenue	2,565 SF Dentist Office
3.	Woody's Diner	2145 West Chapman Avenue	3,400 SF Restaurant
4.	7-11 Gas Station	2245 West Chapman Avenue	2,400 SF Conv. Store and Gas Station
5.	City Plaza	1 West City Boulevard	335 DU Apartments 165 Room Hotel
6.	City Parkway West Apartments	500 & 600 City Parkway	220 Apartments
7.	Town and Country Apartments and Townhomes	702 West Town and Country Road	653 DU Apartments 74 DU Townhomes
8.	999 Town and Country Apartments	999 Town and Country Road	262 DU Apartments
9.	Eleven10 Apartment Homes	1110 Town and Country Road	260 DU Apartments
10.	The Terrace Apartments	SEC of Chapman Avenue and Lewis Street	167 DU Apartments 28 DU Townhomes
11.	Marriott Dual Brand Hotel	3000 West Chapman Avenue	300 Room Hotel 3,000 SF Restaurant

[7] Source: City of Orange Planning Department staff.

TABLE 6-2

CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[8]

No.	Cumulative Project Description	Daily Two-Way	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
1.	3800 Chapman Apartments[9]	1,490	25	97	122	90	49	139
2.	Orange Art of Dentistry	89	5	2	7	3	6	9
3.	Woody's Diner	286	17	14	31	11	8	19
4.	7-11 Gas Station	749	18	18	36	20	20	40
5.	City Plaza[10]	3,130	80	152	232	158	107	265
6.	City Parkway West Apartments[11]	1,170	19	76	95	70	39	109
7.	Town and Country Apartments and Townhomes[12]	2,589	-198	255	57	238	-90	148
8.	999 Town and Country Apartments[13]	1,742	26	108	134	105	58	163
9.	Eleven10 Apartment Homes[14]	1,729	26	107	133	104	57	161
10.	The Terrace Apartments[15]	849	17	44	61	42	27	69
11.	Marriott Dual Brand Hotel	2,811	98	70	168	104	95	199
Total Cumulative Projects Trip Generation Forecast		**16,634**	**133**	**943**	**1,076**	**945**	**376**	**1,321**

8 Unless otherwise noted, Source: *Trip Generation, 10th Edition*, Institute of Transportation Engineers (ITE) [Washington, D.C. (2017)].

9 Source: *3800 Chapman Apartments Traffic Impact Analysis*, prepared by LLG Engineers.

10 Source: *City Plaza Project Traffic Impact Analysis*, prepared by LLG Engineers.

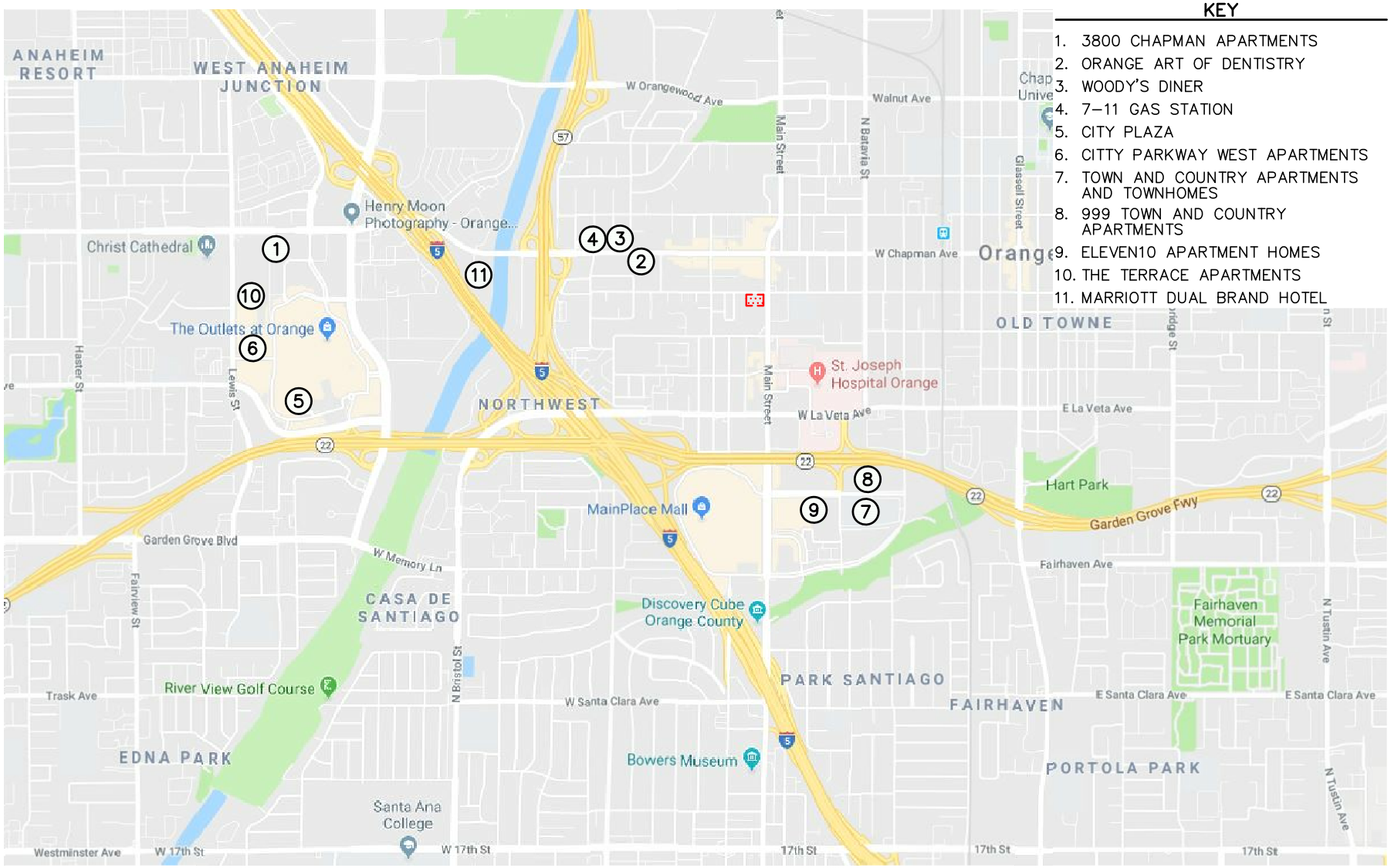
11 Source: *City Parkway West Apartments Project Traffic Impact Analysis*, prepared by LLG Engineers.

12 Source: *Town and Country Apartments and Townhomes Traffic Impact Analysis*, prepared by LLG Engineers.

13 Source: *999 Town & Country Apartments Project Traffic Impact Analysis*, prepared by LLG Engineers.

14 Source: *1100 Town & Country Project Traffic Impact Analysis*, prepared by LLG Engineers.

15 Source: *The Terrace Apartments Traffic Impact Analysis*, prepared by LLG Engineers.



KEY

1. 3800 CHAPMAN APARTMENTS
2. ORANGE ART OF DENTISTRY
3. WOODY'S DINER
4. 7–11 GAS STATION
5. CITY PLAZA
6. CITTY PARKWAY WEST APARTMENTS
7. TOWN AND COUNTRY APARTMENTS AND TOWNHOMES
8. 999 TOWN AND COUNTRY APARTMENTS
9. ELEVEN10 APARTMENT HOMES
10. THE TERRACE APARTMENTS
11. MARRIOTT DUAL BRAND HOTEL

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

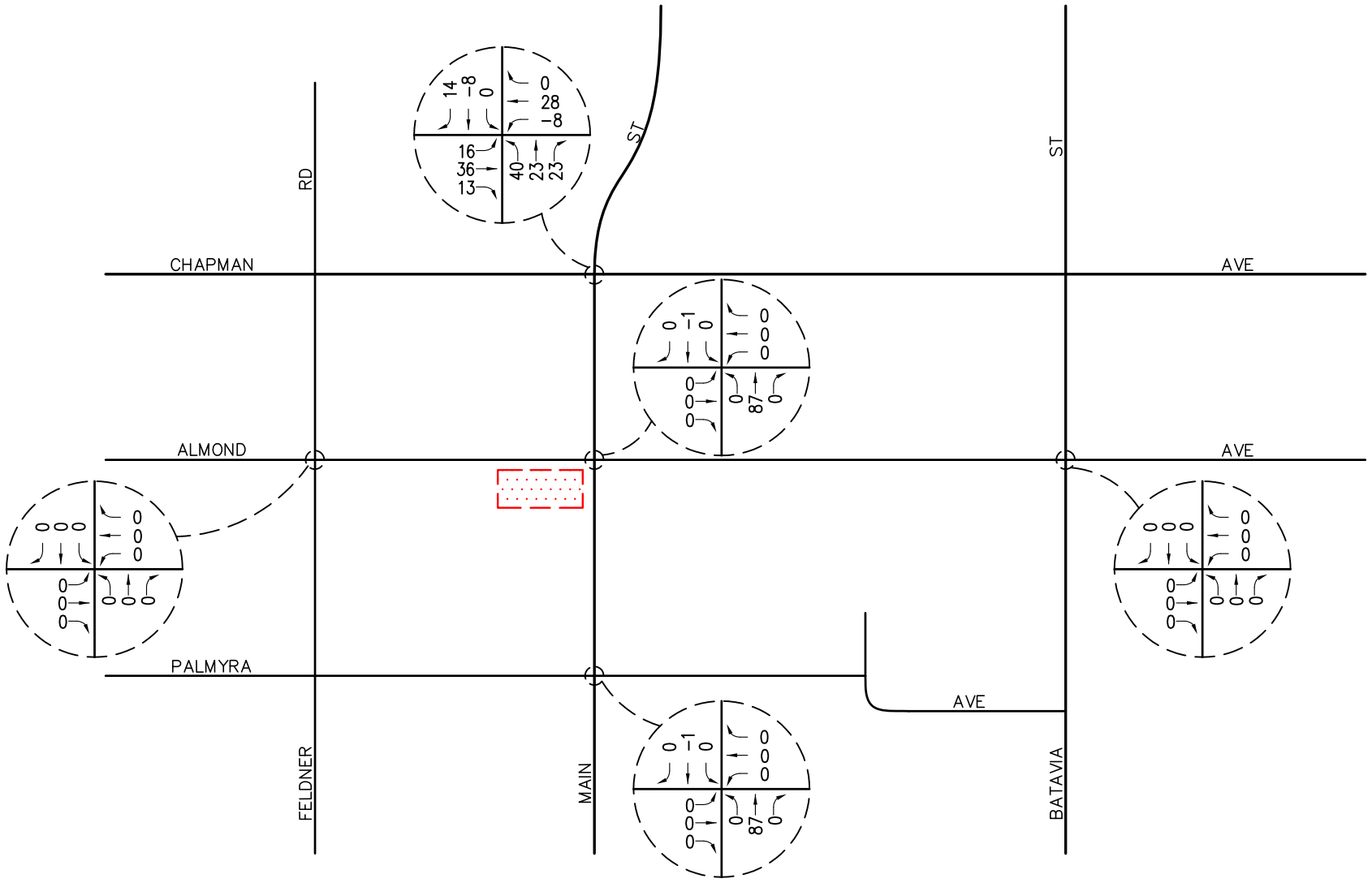
(#) = CUMULATIVE PROJECT LOCATION

= PROJECT SITE

FIGURE 6–1

LOCATION OF CUMULATIVE PROJECTS

CHICK–FIL–A MAIN STREET, ORANGE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

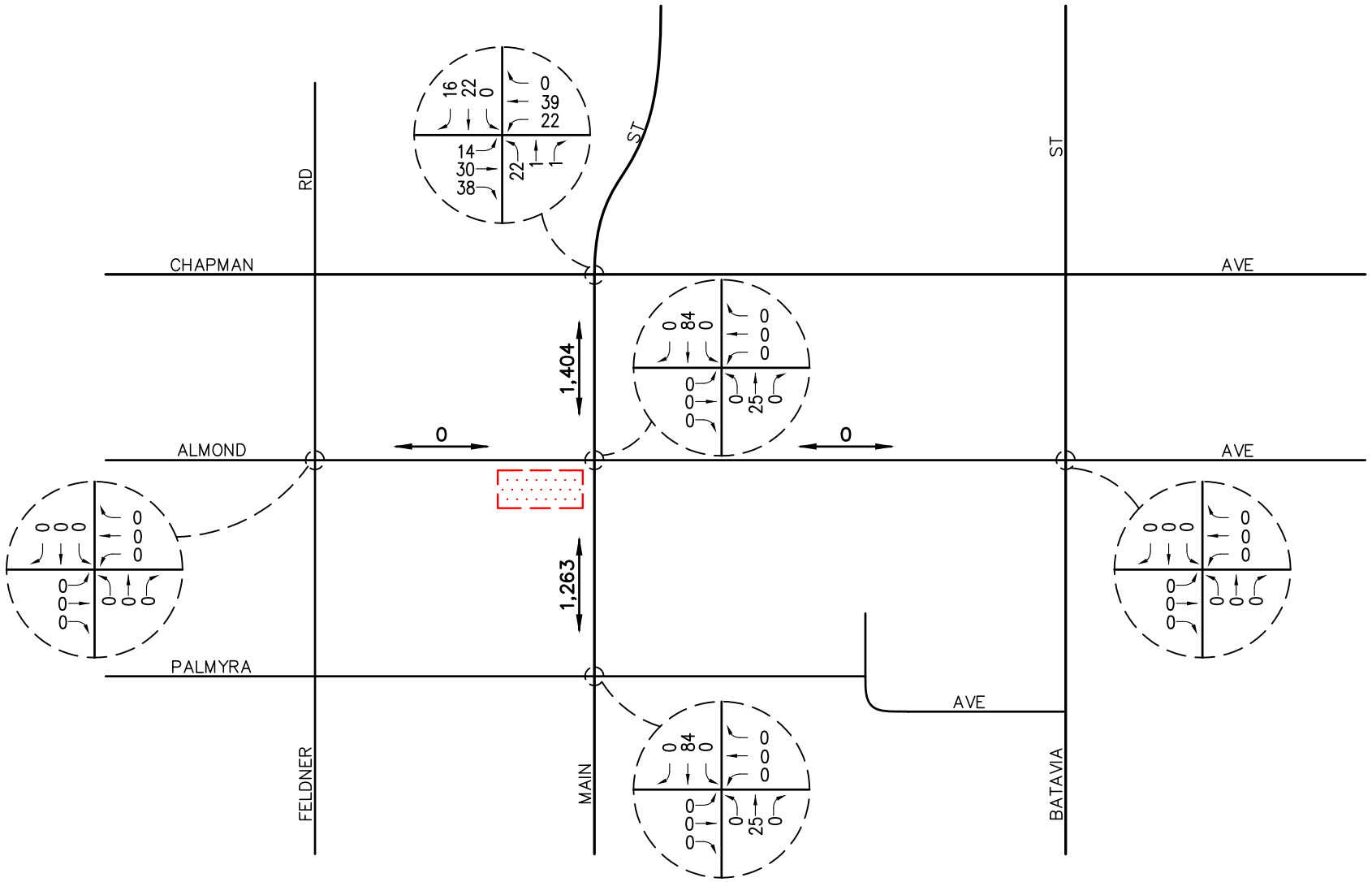
KEY

= PROJECT SITE

FIGURE 6-2

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

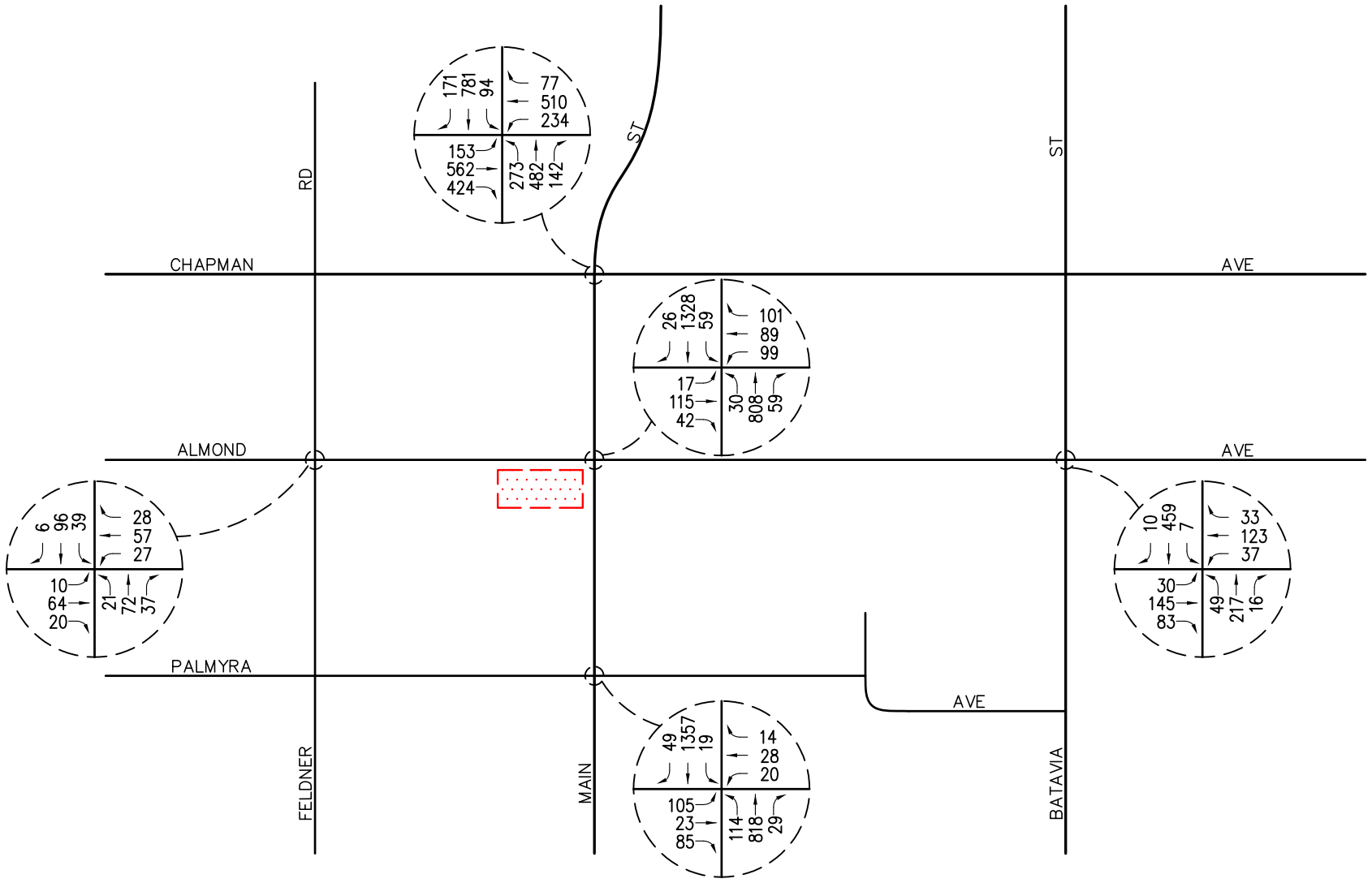
XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 6-3

PM PEAK HOUR AND DAILY CUMULATIVE PROJECTS TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

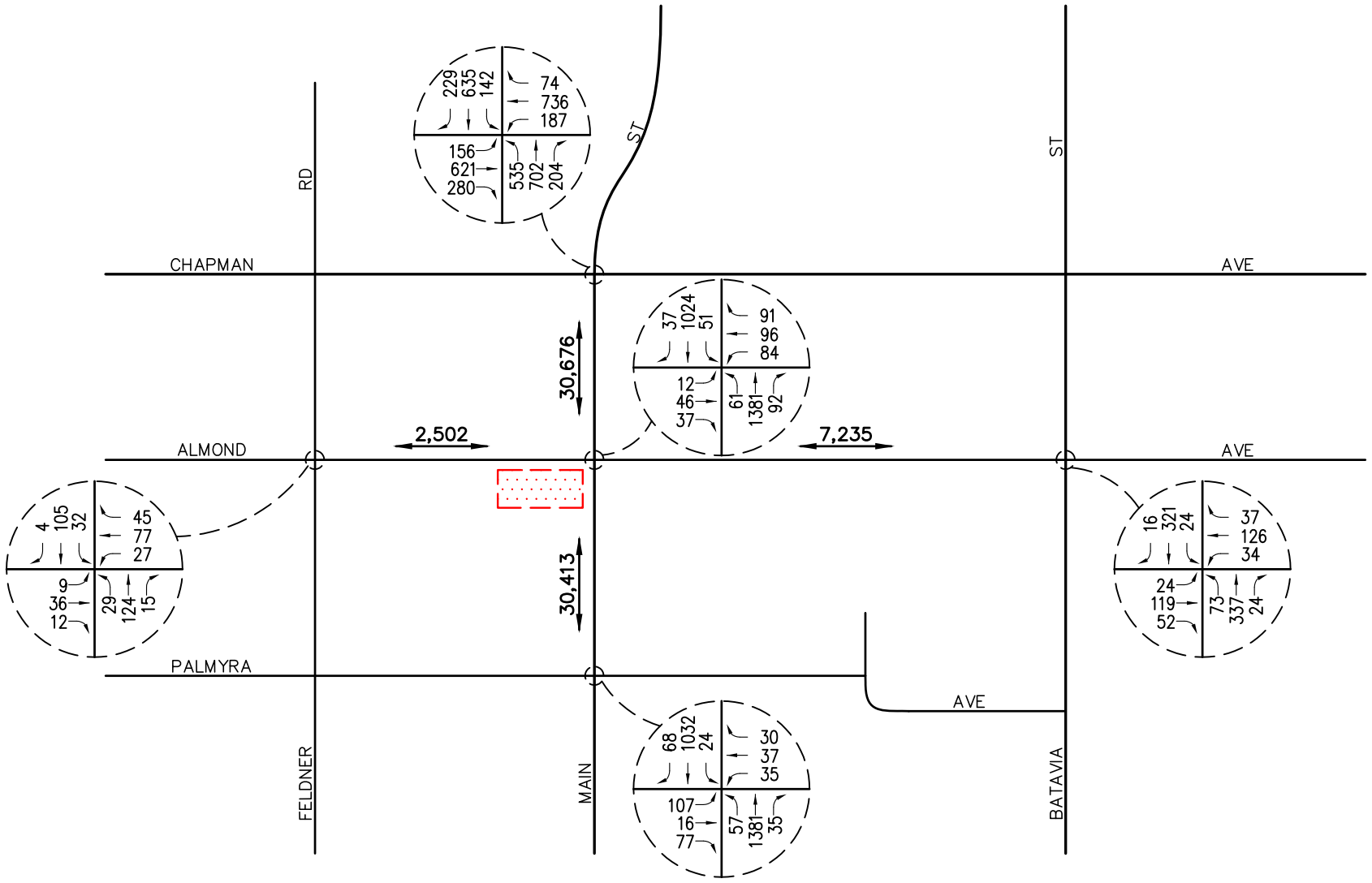
KEY

= PROJECT SITE

FIGURE 6-4

YEAR 2020 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 6-5

YEAR 2020 CUMULATIVE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE

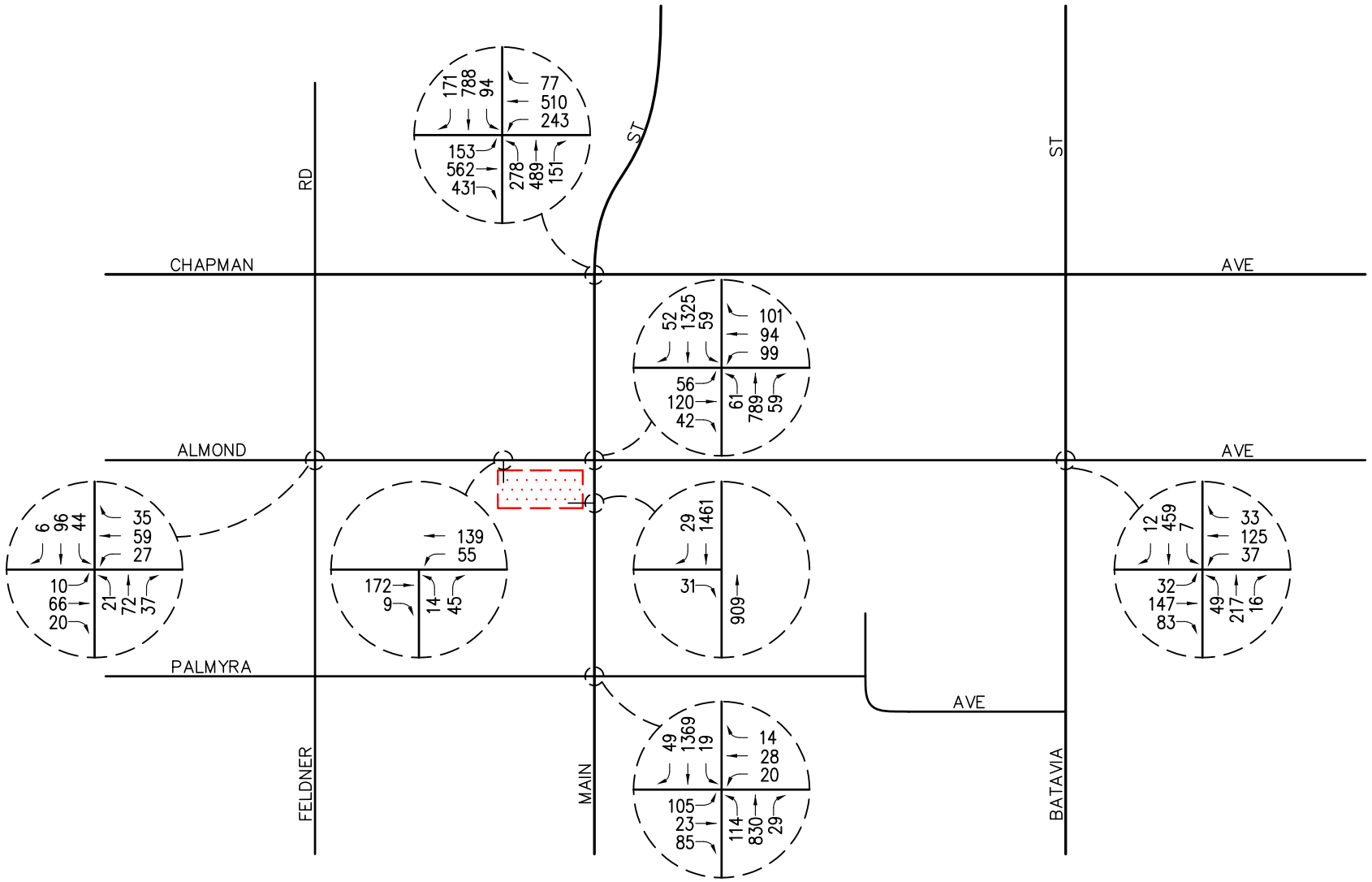

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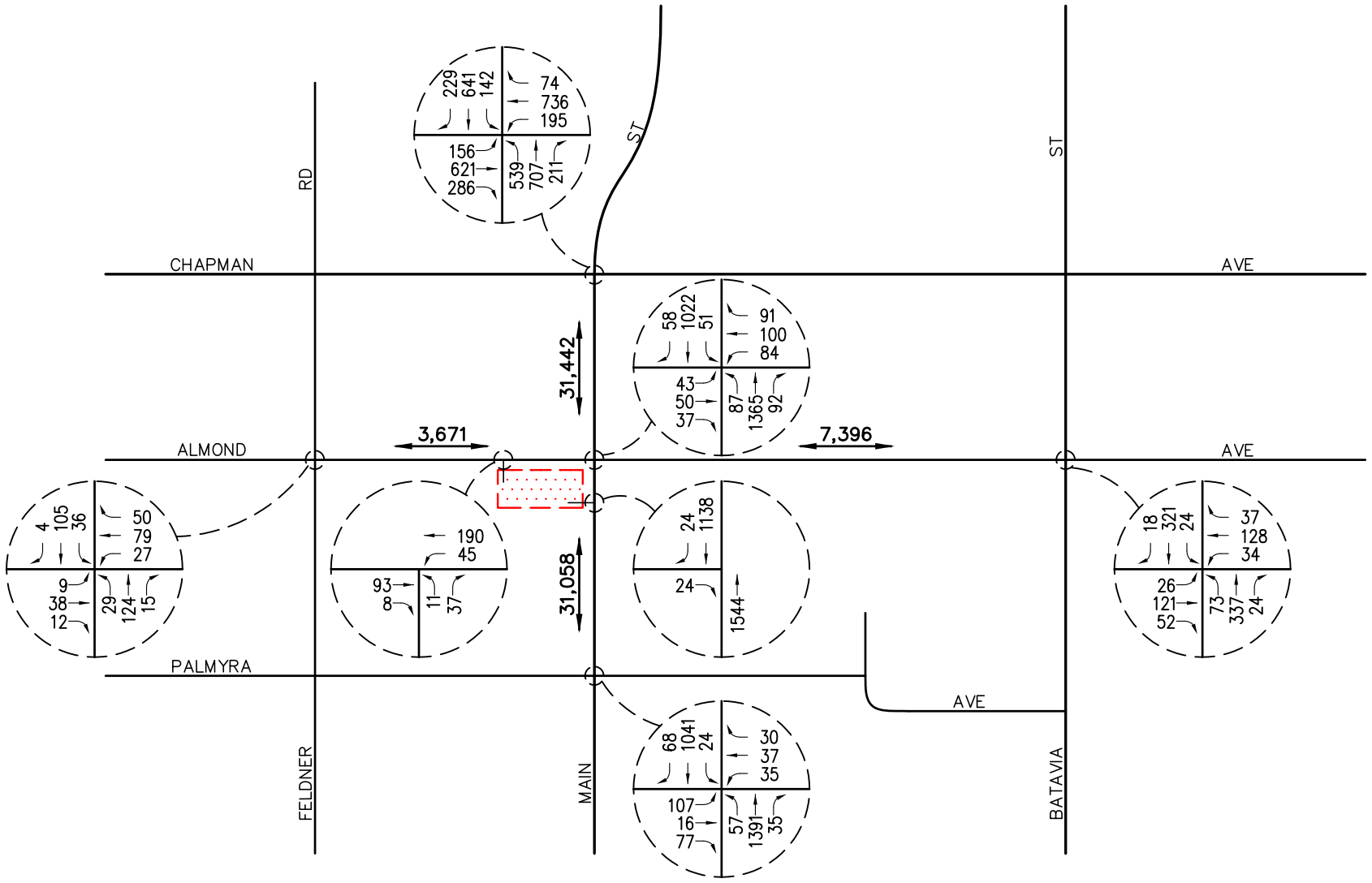
FIGURE 6-6

YEAR 2020 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

XX,XXX = DAILY TRAFFIC VOLUMES

= PROJECT SITE

FIGURE 6-7

YEAR 2020 CUMULATIVE PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

CHICK-FIL-A MAIN STREET, ORANGE

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the proposed Project during the AM peak hour/PM peak hour and on a daily basis was evaluated based on analysis of future operating conditions at the five (5) key study intersections and four (4) key roadway segments, without, then with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection and roadway segment. The significance of the potential impacts of the Project at each key intersection and key roadway segment was then evaluated using the following traffic impact criteria.

7.1 Impact Criteria and Thresholds

Impacts to local and regional transportation systems located in the City of Orange are considered significant if:

Intersections:

- An unacceptable peak hour Level of Service (LOS) at any of the key intersections is projected. According to the City's Circulation Element and stated in the *City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007,* LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak hours on all intersections; and

- The project increases traffic demand at the study intersection by 1% of capacity (ICU increase ≥ 0.010), causing or worsening LOS E or LOS F (ICU > 0.900).

Roadway Segments:

- An unacceptable daily Level of Service (LOS) at any of the key roadway segments is projected. According to the City of Orange General Plan Circulation Element and stated in the *City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007,* LOS D is the minimum acceptable condition that should be maintained on a daily basis on all roadway segments; and

- The project increases traffic demand at the roadway segment by 1% of capacity (V/C increase ≥ 0.010), causing or worsening LOS E or LOS F (V/C > 0.900).

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the five (5) key study intersections and four (4) key roadway segments for existing plus project and near-term (Year 2020) traffic conditions:

(a) Existing Traffic Conditions;
(b) Existing Plus Project Traffic Conditions;
(c) Scenario (b) with Improvements, if necessary;
(d) Near-Term (Year 2020) Cumulative Traffic Conditions,
(e) Near-Term (Year 2020) Cumulative plus Project Traffic Conditions; and
(f) Scenario (e) with Improvements, if necessary.

8.0 EXISTING PLUS PROJECT ANALYSIS

The following summarizes the "Existing Plus Project" level of service results for the five (5) key study intersections and four (4) key roadway segments.

8.1 Intersections

Table 8-1 summarizes the peak hour level of service results at the five (5) key study intersections for existing plus project traffic conditions. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists existing plus project traffic conditions. The third column (3) shows the increase in ICU and/or Delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

8.1.1 Existing Plus Project Traffic Conditions

Review of Columns (2) and (3) of *Table 8-1* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the five (5) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The five (5) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

Appendix C also presents the existing plus project ICU/LOS and HCM/LOS calculations for the five (5) key study intersections for the AM peak hour and PM peak hour.

8.2 Roadway Segments

Table 8-2 summarizes the roadway segment level of service results at the four (4) key roadway segments for existing plus project traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of existing daily traffic conditions (which were also presented in *Table 3-5*). The fifth column (5) lists existing plus project daily traffic conditions. Column (5) also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

8.2.1 Existing Plus Project Traffic Conditions

Review of Column 5 of *Table 8-2* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the four (4) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. The four (4) key roadway segments currently operate and are forecast to continue to operate at an acceptable service level on a daily basis with the addition of Project generated traffic to existing traffic.

TABLE 8-1

EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	Minimum Acceptable LOS	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Project Significant Impact		(4) Existing Plus Project With Mitigation	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Main Street at Chapman Avenue	AM	D	0.654	B	0.666	B	0.012	No	--	--
	PM		0.657	B	0.660	B	0.003	No	--	--
2. Feldner Road at Almond Avenue	AM	D	8.4 s/v	A	8.4 s/v	A	0.0 s/v	No	--	--
	PM		8.6 s/v	A	8.7 s/v	A	0.1 s/v	No	--	--
3. Main Street at Almond Avenue	AM	D	0.475	A	0.501	A	0.026	No	--	--
	PM		0.455	A	0.472	A	0.017	No	--	--
4. Batavia Street at Almond Avenue	AM	D	20.0 s/v	C	20.4 s/v	C	0.4 s/v	No	--	--
	PM		18.0 s/v	C	18.3 s/v	C	0.3 s/v	No	--	--
5. Main Street at Palmyra Avenue	AM	D	0.521	A	0.523	A	0.002	No	--	--
	PM		0.467	A	0.469	A	0.002	No	--	--

Notes:

- s/v = seconds per vehicle (delay)
- **BOLD ICU/LOS** and **HCM/LOS** values indicate unacceptable service level

TABLE 8-2

EXISTING PLUS PROJECT ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

Key Roadway Segment	Min. Acc. LOS	(1) No. of Existing Lanes	(2) Arterial Classification	(3) Existing Capacity at LOS "E"	(4) Existing Traffic Conditions			(5) Existing Plus Project Traffic Conditions				
					Daily Volume	V/C Ratio	LOS	Daily Volume	V/C Ratio	LOS	Inc.	Adverse (Yes/No)
A. Main Street between Chapman Avenue and Almond Avenue	D	6D	Major	56,300	28,698	0.510	A	29,464	0.523	A	0.013	No
B. Almond Avenue between Feldner Road and Main Street	D	2U	Collector	12,000	2,453	0.204	A	3,622	0.302	A	0.098	No
C. Almond Avenue between Main Street and Batavia Street	D	2U	Collector	12,000	7,093	0.591	A	7,254	0.605	B	0.014	No
D. Main Street between Almond Avenue and Palmyra Avenue	D	6D	Major	56,300	28,578	0.508	A	29,223	0.519	A	0.011	No

9.0 YEAR 2020 PLUS PROJECT ANALYSIS

The following summarizes the "Year 2020 Plus Project" level of service results for the five (5) key study intersections and four (4) key roadway segments.

9.1 Intersections

Table 9-1 summarizes the peak hour level of service results at the five (5) key study intersections for Year 2020 traffic conditions. The first column (1) of ICU/LOS and HCM/LOS values in *Table 9-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists projected cumulative traffic conditions (existing plus ambient traffic plus cumulative project traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2020 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU and/or Delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

9.1.1 Year 2020 Cumulative Traffic Conditions

An analysis of future (Year 2020) cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will not adversely impact any of the five (5) key study intersections. The five (5) key study intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic.

9.1.2 Year 2020 Cumulative Plus Project Traffic Conditions

Review of Columns (3) and (4) of *Table 9-1* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the five (5) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The five (5) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic to Year 2020 cumulative traffic.

Appendix C also presents the Year 2020 plus project ICU/LOS and HCM/LOS calculations for the five (5) key study intersections.

9.2 Roadway Segments

Table 9-2 summarizes the roadway segment level of service results at the four (4) key roadway segments for Year 2020 traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of projected Year 2020 cumulative daily traffic conditions. The fifth column (5) lists Year 2020 plus project daily traffic conditions. Column (5) also shows the increase in V/C ratio value due to the added daily project trips and indicates

whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

9.2.1 Year 2020 Cumulative Traffic Conditions

An analysis of future (Year 2020) cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will not adversely impact any of the four (4) key roadway segments on a daily basis under Year 2020 Cumulative traffic conditions (i.e. existing plus ambient traffic plus cumulative project traffic). The four (4) key roadway segments currently operate and are forecast to continue to operate at acceptable level of service on a daily basis with the addition of ambient traffic growth and cumulative project traffic.

9.2.2 Year 2020 Cumulative Plus Project Traffic Conditions

Review of Column 5 of *Table 9-2* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the four (4) key roadway segments on a daily basis under Year 2020 Cumulative Plus Project traffic conditions. The four (4) key roadway segments currently operate and are forecast to continue to operate at an acceptable level of service on a daily basis with the addition of Project generated traffic to Year 2020 cumulative traffic.

TABLE 9-1

YEAR 2020 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	Minimum Acceptable LOS	(1) Existing Traffic Conditions		(2) Year 2020 Cumulative Traffic Conditions		(3) Year 2020 Cumulative Plus Project Traffic Conditions		(4) Project Significant Impact		(5) Year 2020 Cumulative Plus Project With Mitigation	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Main Street at Chapman Avenue	AM	D	0.654	B	0.667	B	0.678	B	0.011	No	--	--
	PM		0.657	B	0.702	C	0.705	C	0.003	No	--	--
2. Feldner Road at Almond Avenue	AM	D	8.4 s/v	A	8.4 s/v	A	8.5 s/v	A	0.1 s/v	No	--	--
	PM		8.6 s/v	A	8.7 s/v	A	8.7 s/v	A	0.0 s/v	No	--	--
3. Main Street at Almond Avenue	AM	D	0.475	A	0.484	A	0.509	A	0.025	No	--	--
	PM		0.455	A	0.468	A	0.485	A	0.017	No	--	--
4. Batavia Street at Almond Avenue	AM	D	20.0 s/v	C	21.4 s/v	C	21.9 s/v	C	0.5 s/v	No	--	--
	PM		18.0 s/v	C	18.9 s/v	C	19.2 s/v	C	0.3 s/v	No	--	--
5. Main Street at Palmyra Avenue	AM	D	0.521	A	0.530	A	0.532	A	0.002	No	--	--
	PM		0.467	A	0.480	A	0.482	A	0.002	No	--	--

Notes:

- s/v = seconds per vehicle (delay)
- **BOLD ICU/LOS** and **HCM/LOS** values indicate unacceptable service level

TABLE 9-2

YEAR 2020 ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

Key Roadway Segment	Min. Acc. LOS	(1) No. of Existing Lanes	(2) Arterial Classification	(3) Existing Capacity at LOS "E"	(4) Year 2020 Cumulative Traffic Conditions			(5) Year 2020 Cumulative Plus Project Traffic Conditions				
					Daily Volume	V/C Ratio	LOS	Daily Volume	V/C Ratio	LOS	Inc.	Adverse (Yes/No)
A. Main Street between Chapman Avenue and Almond Avenue	D	6D	Major	56,300	30,676	0.545	A	31,442	0.558	A	0.013	No
B. Almond Avenue between Feldner Road and Main Street	D	2U	Collector	12,000	2,502	0.209	A	3,671	0.306	A	0.097	No
C. Almond Avenue between Main Street and Batavia Street	D	2U	Collector	12,000	7,235	0.603	B	7,396	0.616	B	0.013	No
D. Main Street between Almond Avenue and Palmyra Avenue	D	6D	Major	56,300	30,413	0.540	A	31,058	0.552	A	0.012	No

10.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

10.1 Site Access Evaluation

As shown previously in *Figure 2-2*, access to the Project site will be provided via one (1) unsignalized, full-access driveway located along Almond Avenue (Project Driveway No. 1) and one (1) unsignalized, right-turn in/right-turn out only driveway located along Main Street (Project Driveway No. 2).

Table 10-1 summarizes the intersection operations at the proposed project driveways for near-term (Year 2020) traffic conditions at completion and full occupancy of the proposed Project. The operations analysis for the Project driveways is based on the *Highway Capacity Manual 6th Edition* (HCM 6) unsignalized methodology. Review of *Table 10-1* shows that the two (2) proposed project driveways are forecast to operate at acceptable LOS C or better during the AM and PM peak hours for Year 2020 traffic conditions. As such, project access will be adequate. Motorists entering and exiting the project site will be able to do so comfortably, safely, and without undue congestion.

It should be noted that there is adequate width on Almond Avenue (40 feet curb to curb) and "No Stopping" restrictions on both sides of the roadway between Main Street and the Project driveway, such that westbound through traffic will not be impeded by a vehicle(s) waiting to execute a westbound left turn into the Project driveway on Almond Avenue. Furthermore, based on the volume of conflicting eastbound traffic, the westbound left turn delay at the Project driveway is very low, such that the aforementioned condition would not occur often.

Appendix D presents the level of service calculation worksheets for the project driveways under Year 2020 Cumulative plus Project traffic conditions.

10.2 Internal Circulation Evaluation

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* on an overall basis is adequate. Curb return radii have been confirmed and are generally adequate for small service/delivery (FedEx, UPS) trucks and trash trucks.

10.3 Drive-Through Queuing Analysis

To confirm the adequacy of storage provided for the proposed drive-through lane, which consists of 17 vehicles, the results of drive-through queuing observations conducted at five (5) existing comparative Chick-fil-A restaurants were utilized. The five (5) locations consisted of the following:

- Chick-fil-A Tustin, located at 2889 Park Avenue
- Chick-fil-A Orange, located at 2575 N. Tustin Street
- Chick-fil-A Irvine, located at 6428 Irvine Boulevard
- Chick-fil-A Laguna Hills, located at 24011 El Toro Road
- Chick-fil-A Corona, located at 3555 Grand Oaks

Drive-through queuing observations were conducted at each of the five (5) locations on a weekday during the morning, mid-day and evening service periods, generally between the hours of 7:00 AM and 9:00 AM, 11:00 AM and 2:00 PM, and 4:00 PM and 7:00 PM. Saturday queuing observations were also collected between 11:30 AM and 2:30 PM and 4:00 PM and 10:00 PM at only the Laguna Hills site and the Corona site.

Table 10-2 summarizes the results of the drive-through queuing analysis summary for the proposed Project. Column one (1) presents the study sites and column two (2) presents the study site locations. Column three (3) presents the observed 85th percentile queue, the observed 95th percentile queue and the observed maximum queue for each site. Column four (4) compares the 85th percentile queue for each site to the proposed drive-through lane storage and indicates whether or not the proposed drive-through lane will provide adequate storage. It should be noted that the 85th percentile queue is generally utilized when designing/sizing the length of the proposed drive-through lane.

Review of column 3 of *Table 10-2* indicates that the five (5) study sites experienced an 85th percentile queue range between 6 vehicles and 13 vehicles. As shown in column 4 of *Table 10-2*, the proposed Project will provide storage for up to 17 vehicles within the proposed drive-through lane without encroaching into the drive aisle. Therefore, the 85th percentile expected queues can be accommodated without interfering with internal circulation or causing congestion to the drive aisle. It should be further noted that the proposed 17 vehicle storage drive-through lane can also accommodate the observed 95th percentile queues and the observed maximum queues of the five (5) study sites.

Even though it is anticipated that the proposed drive-through lane will accommodate all potential queues on site; Chick-fil-A staff will implement the following program, on an as-needed basis during their peak operating times, to further ensure that vehicles will not queue back onto the public streets. The program consists of the following as provided by Chick-fil-A management staff:

- "Our restaurants are staffed so that if the drive-thru queuing begins stacking onto the street, team members go out and assist with ordering via Chick-fil-A's iPad ordering system. Our operators use the iPad ordering during our peak hours of 11:30 am to 1:30 pm and any additional time when needed. The iPad ordering system allows team members to take orders, receive payment, and assist with traffic movement within the parking lot.

  Based on data from our other comparable stores, the iPad ordering system increases the CFA drive thru speed of service by 30% than the typical speaker box. Putting people forward in the drive-through is one of our biggest competitive advantages in the market because it personally connects our team members with our valued guest. We want to continue this momentum by building a platform to supporting current and future innovations that increase capacity and put our people forward to care for our guest in every interaction. Our customers enjoy the face to face ordering over the standard drive-thru experience."

Appendix E presents the drive-through queuing study data for the five (5) existing comparative sites.

TABLE 10-1

PROJECT DRIVEWAY PEAK HOUR LEVELS OF SERVICE SUMMARY

Project Driveway		Time Period	Intersection Control	Year 2020 Plus Project Traffic Conditions	
				HCM	LOS
A.	Project Driveway No. 1 at Almond Avenue	AM	One–Way	10.1 s/v	B
		PM	Stop	9.5 s/v	A
B.	Main Street at Project Driveway No. 2	AM	One–Way	18.1 s/v	C
		PM	Stop	14.8 s/v	B

Note:

s/v = seconds per vehicle

TABLE 10-2

DRIVE-THROUGH LANE QUEUING ANALYSIS SUMMARY

(1) Study Site	(2) Location	(3) Number of Vehicles Observed In The Drive-Through Lane			(4) Proposed Project	
		85th Percentile	95th Percentile	Maximum	Drive-Through Lane Storage	Adequate For 85th Percentile (Yes/No)
Chick-fil-A (City of Tustin)	2889 Park Avenue, Tustin, CA	6	13	15	17	Yes
Chick-fil-A (City of Orange)	2575 N. Tustin Street, Orange, CA	11	14	15	17	Yes
Chick-fil-A (City of Irvine)	6428 Irvine Boulevard, Irvine, CA	8	10	12	17	Yes
Chick-fil-A (City of Laguna Hills)	24011 El Toro Road, Laguna Hills, CA	11	14	17	17	Yes
Chick-fil-A (City of Corona)	3555 Grand Oaks, Corona, CA	13	13	16	17	Yes

11.0 RECOMMENDED IMPROVEMENTS

For those intersections and roadway segments where projected traffic volumes are expected to result in significant cumulative impacts, this report recommends traffic improvements that change the intersection and/or roadway segments geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) roadways to specific approaches of a key intersection and/or roadway segments. The identified improvements are expected to:

- Address the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and Cumulative) traffic, and
- Improve Levels of Service to an acceptable range and/or to pre-project conditions.

11.1 Existing Plus Project Traffic Conditions

The results of the "Existing Plus Project" intersection capacity analysis and daily roadway segment analysis presented previously in *Table 8-1* and *Table 8-2*, respectively, indicates that the proposed Project will not significantly impact any of the five (5) key study intersections or the four (4) key roadway segments. Given that there are no significant project impacts, no improvements are required under Existing Plus Project traffic conditions.

11.2 Year 2020 Plus Project Traffic Conditions

The results of the "Year 2020 Cumulative Plus Project" intersection capacity analysis and daily roadway segment analysis presented previously in *Table 9-1* and *Table 9-2*, respectively, indicates that the proposed Project will not significantly impact any of the five (5) key study intersections or the four (4) key roadway segments. Given that there are no significant project impacts, no improvements are required under Year 2020 Cumulative Plus Project traffic conditions.

12.0 CONGESTION MANAGEMENT PROGRAM (CMP)

This analysis is consistent with the requirements and procedures outlined in the current *Orange County Congestion Management Program (CMP).* The CMP requires that a traffic impact analysis be conducted for any project generating 2,400 or more daily trips, or 1,600 or more daily trips for projects that directly access the CMP Highway System (HS). Per the CMP guidelines, this number is based on the desire to analyze any impacts that will be 3.0% or more of the existing CMP highway system facilities' capacity.

However, as noted in this traffic study, the proposed Project is expected to generate 1,612 daily trips, and thus does not meet the criteria required for a CMP traffic analysis. Therefore, it is concluded that the proposed Project will not have any significant traffic impacts on the Congestion Management Program Highway System.

13.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – The Project site is generally located on the southwest quadrant of Main Street and Almond Avenue in the City of Orange, California. The proposed Project proposes to demolish the existing vacant structure on the site and construct a 4,563 SF Chick-fil-A restaurant with drive-through window and drive-through queue storage of 17 vehicles. A total of 48 parking spaces will be provided on site and parking is restricted along both the Main Street and Almond Avenue Project frontages. The proposed Project is expected to be constructed and fully occupied by the Year 2020.

  Access to the Project site will be provided via one (1) unsignalized, full-access driveway located along Almond Avenue (Project Driveway No. 1) and one (1) unsignalized, right-turn in/right-turn out only driveway located along Main Street (Project Driveway No. 2).

- ***Study Scope*** – The five (5) key study intersections and four (4) key roadway segments selected for evaluation were determined based on coordination with City of Orange Traffic Engineering staff and application of the "51 or more peak hour trip threshold" criteria outlined in the *City of Orange Traffic Impact Analysis Guidelines*, dated August 15, 2007. The intersections and roadway segments listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. It should be noted that each key study intersection and roadway segment is located within the City of Orange.

Key Study Intersections
1. Main Street at Chapman Avenue
2. Feldner Road at Almond Avenue
3. Main Street at Almond Avenue
4. Batavia Street at Almond Avenue
5. Main Street at Palmyra Avenue

Key Roadway Segments
A. Main Street, between Chapman Avenue and Almond Avenue
B. Almond Avenue, between Feldner Road and Main Street
C. Almond Avenue, between Main Street and Batavia Street
D. Main Street, between Almond Avenue and Palmyra Avenue

  Detailed peak hour level of service analyses were prepared for Existing Traffic Conditions, Existing Plus Project Traffic Conditions, Year 2020 Cumulative Traffic Conditions, and Year 2020 Cumulative Plus Project Traffic Conditions at these locations.

- ***Existing Traffic Conditions*** – All five (5) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours. All four (4) key roadway segments currently operate at acceptable LOS A on a daily basis.

- ***Project Trip Generation*** – The proposed Project is forecast to generate 1,612 daily trips, with 93 trips (47 inbound, 46 outbound) produced in the AM peak hour and 74 trips (38 inbound, 36 outbound) produced in the PM peak hour on a "typical" weekday.

- ***Cumulative Projects Traffic Characteristics*** – The eleven (11) cumulative projects are forecast to generate a total of 16,634 daily trips, with 1,076 trips (133 inbound and 943 outbound) forecast during the AM peak hour and 1,321 trips (945 inbound and 376 outbound) forecast during the PM peak hour.

- ***Existing Plus Project Traffic Conditions*** – The proposed Project ***will not*** significantly impact any of the five (5) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The five (5) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

  The proposed Project ***will not*** significantly impact any of the four (4) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. The four (4) key roadway segments currently operate and are forecast to continue to operate at an acceptable service level on a daily basis with the addition of Project generated traffic to existing traffic.

- ***Year 2020 Cumulative Plus Project Traffic Conditions*** – The proposed Project ***will not*** significantly impact any of the five (5) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The five (5) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic to Year 2020 cumulative traffic.

  The proposed Project ***will not*** significantly impact any of the four (4) key roadway segments on a daily basis under Year 2020 Cumulative Plus Project traffic conditions. The four (4) key roadway segments currently operate and are forecast to continue to operate at an acceptable level of service on a daily basis with the addition of Project generated traffic to Year 2020 cumulative traffic.

- ***Site Access and Internal Circulation Evaluation –*** The proposed project driveways are forecast to operate at acceptable LOS C or better during the AM and PM peak hours for Year 2020 traffic conditions. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so comfortably, safely, and without undue congestion.

  The on-site circulation layout of the proposed Project on an overall basis is adequate. Curb return radii have been confirmed and are generally adequate for small service/delivery (FedEx, UPS) trucks and trash trucks.

- ***Drive-Through Queuing Analysis –*** The five (5) study sites experienced an 85th percentile queue range between 6 vehicles and 13 vehicles. The proposed Project will provide storage for up to 17 vehicles within the proposed drive-through lane without encroaching into the drive aisle. Therefore, the 85th percentile expected queues can be accommodated without interfering with internal circulation or causing congestion to the drive aisle. It should be further noted that the proposed 17 vehicle storage drive-through lane can also accommodate the observed 95th percentile queues and the observed maximum queues of the five (5) study sites.

Even though it is anticipated that the proposed drive-through lane will accommodate all potential queues on site; Chick-fil-A staff will implement the following program, on an as-needed basis during their peak operating times, to further ensure that vehicles will not queue back onto the public streets. The program consists of the following as provided by Chick-fil-A management staff:

- "Our restaurants are staffed so that if the drive-thru queuing begins stacking onto the street, team members go out and assist with ordering via Chick-fil-A's iPad ordering system. Our operators use the iPad ordering during our peak hours of 11:30 am to 1:30 pm and any additional time when needed. The iPad ordering system allows team members to take orders, receive payment, and assist with traffic movement within the parking lot.

  Based on data from our other comparable stores, the iPad ordering system increases the CFA drive thru speed of service by 30% than the typical speaker box. Putting people forward in the drive-through is one of our biggest competitive advantages in the market because it personally connects our team members with our valued guest. We want to continue this momentum by building a platform to supporting current and future innovations that increase capacity and put our people forward to care for our guest in every interaction. Our customers enjoy the face to face ordering over the standard drive-thru experience."

- ***Existing Plus Project Recommended Improvements –*** The proposed Project will not significantly impact any of the five (5) key study intersections or the four (4) key roadway segments. Given that there are no significant project impacts, no improvements are required under Existing Plus Project traffic conditions.

- ***Year 2020 Cumulative Plus Project Recommended Improvements –*** The proposed Project will not significantly impact any of the five (5) key study intersections or the four (4) key roadway segments. Given that there are no significant project impacts, no improvements are required under Year 2020 Cumulative Plus Project traffic conditions.

- ***Congestion Management Program (CMP) –*** The proposed Project will not have any significant traffic impacts on the Congestion Management Program Highway System.