



May 27, 2021

Shawn Danesh
c/o. Hannibal Petrossi
Calvada Development, Inc.
26996 La Paz Rd.
Aliso Viejo, CA 92656

**Re: Queuing Analysis and Trip Generation
Proposed Popeyes Louisiana Kitchen
584 N. Tustin Street, Orange**

Dear Shawn,

Per your request, we have conducted a queuing analysis and trip generation for the proposed Popeyes Louisiana Kitchen in Orange. This letter presents our methodology, finding, and recommendation.

PROJECT INFORMATION

The project site is located at 584 N. Tustin Street in the City of Orange. This project consists of demolishing an existing sit-down restaurant of 3,468 square feet and constructing a restaurant building of 2,344 square feet for Popeyes Louisiana Kitchen with a drive-through lane. Proposed site plan is shown in **Exhibit 1**. The proposed drive-through lane provides a capacity of ten (10) cars stacking with the ordering station placed at the fifth car. The proposed site can hold a maximum of nineteen (19) drive-through vehicles without affecting the public right-of-way.

QUEUING ANALYSIS

To evaluate the stacking capacity, the consultant conducted a stacking analysis of similar drive-through facilities at the following locations:

1. Popeyes Louisiana Kitchen Drive-Thru at 1911 Indian Hill Boulevard, Pomona
2. Popeyes Louisiana Kitchen Drive-Thru at 525 S. Citrus Ave, Covina
3. Popeyes Louisiana Kitchen Drive-Thru at 19102 Beach Blvd, Huntington Beach

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Pre-pandemic operational data are used in this study to reveal its normal conditions prior to the shutdown of many non-essential businesses and activities as a result of the ongoing COVID-19 pandemic. Complete data of comparable drive-through operations can be found in **Appendix A, B, and C**. Queue analysis for these comparable sites is summarized in **Table 1**.

Table 1. Queue Analysis for Comparable Site

	Queue Capacity (Vehicle)	Ordering Station (Vehicle)	Max. Hold On-Site (Vehicle)	Study Samples (Trip)	Highest Hourly Volume (Trip)	Peak Period	Longest Queue (Vehicle)
Pomona	9	5 th	18	2,070	37	1-2 p.m. Tuesday	6
Covina	6	4 th	10	2,400	41	12-1 p.m. Monday	9
Huntington Beach	5	3 rd	15	1,931	41	12-1 p.m. Monday	5

The busiest hours for Popeyes Louisiana Kitchen drive-through operations are general lunch hours between 12:00 and 2:00 p.m. With a sample of more than 1,900 drive-thru trips for each comparable site over the span of seven (7) days, the study has found the maximum queue of nine (9) vehicles. The highest hourly drive-thru volume was 41 trips between 12:00 and 1:00 pm on Monday.

TRIP GENERATION

Passenger vehicle trips were estimated using the rates and methodologies outlined in *Trip Generation, 10th Edition*, published by the institute of Transportation Engineers (ITE). Applicable trip generation rates are shown in **Table 2**.

Table 2. Trip Generation Rate

Land Use (ITE Code)	Unit	Daily	AM Peak Hour			PM Peak Hour		
			Rate	IN	OUT	Rate	IN	OUT
Fast-Food Restaurant with Drive-Through Window (934)	1,000 Sq. Ft.	470.95	40.19	51%	49%	32.67	52%	48%
High-Turnover (Sit-Down) Restaurant (932)	1,000 Sq. Ft.	112.18	9.94	0.55	0.45	9.77	0.62	0.38

Based on ITE's *Trip Generation Handbook, Third Edition*, the study has applied pass-by reduction for the project use. The project has a NET trip generation 14 trips in the AM peak hour, 19 trips in the PM peak hour, and 536 daily trips. The projected trips associated with the project are provided in **Table 3**.

Table 3. NET Trip Generation

Land Use (ITE Code)	Unit	Quantity	AM Peak Hour			PM Peak Hour			Daily
			Total	IN	OUT	Total	IN	OUT	
Proposed Use: Fast-Food Restaurant with Drive-Through Window (934)	1,000 Sq. Ft.	2.344	94	48	46	77	40	37	1104
	Pass-by Trip Reduction	AM: 49% PM: 50% Daily: 25%	(46)	(23)	(23)	(38)	(20)	(18)	(276)
	Total		48	25	23	38	20	18	828
Existing Use Trip Credit: High-Turnover (Sit-Down) Restaurant (932)	1,000 Sq. Ft.	(3.468)	(34)	(19)	(16)	(34)	(21)	(13)	(389)
	Pass-by Trip Reduction	AM: 0% PM: 43% Daily: 25%	0	0	0	15	9	6	97
	Total		(34)	(19)	(16)	(19)	(12)	(7)	(292)
NET Trip Generation			14	6	7	19	8	11	536

DRIVE-THROUGH CONTINGENCY PLAN

In the unlikely event that drive-through queuing extends beyond ten (10) vehicles in the drive-through lane, the site is capable of accommodating nine (9) additional vehicles on site without affecting the public right-of-way. As an extra layer of protection, if the drive-through queue exceeds 15 vehicles at any time, the restaurant operator will allocate one staff to be stationed at the site entrance to redirect and turn away incoming traffic as necessary in order to prevent any queuing onto Tustin Street.

In addition, the proposed restaurant accepts mobile ordering through its website and mobile app to divert drive-through traffic and encourage ordering in advance. Mobile orders customers will be instructed to park at the designated space and their

food will be delivered directly to their vehicles. Mobile order is expected to further decrease the chances of long queues especially in the peak hour.

CONCLUSION

Based on the study of similar drive-through operations, the project has provided sufficient stacking length to accommodate ten (10) vehicles, exceeding the expected maximum queue. No overflow or interruption onto the parking area is expected. On site circulation is deemed efficient without any bottleneck.

The project does not generate more than 100 vehicle trips in the AM or PM peak hour. According to the “City of Orange Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment,” the threshold has not been met and the project is not required to provide a Traffic Impact Analysis (TIA).

Regards,

K2 Traffic Engineering, Inc.



Jende “Kay” Hsu, T.E.
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Appendix A: Comparable Drive-Through Operation at Pomona

Table 1. Drive-Through Vehicle Volume

Popeyes Louisiana Kitchen
1911 Indian Hill Boulevard, Pomona

	1/13	1/14	1/15	1/16	1/17	1/18	1/19
	MON	TUE	WED	THU	FRI	SAT	SUN
9:00 AM	0	0	0	1	1	0	3
10:00 AM	10	15	15	15	13	11	17
11:00 AM	23	21	22	20	25	23	24
12:00 PM	22	32	23	23	30	34	27
1:00 PM	23	37	24	22	31	33	28
2:00 PM	29	22	22	26	28	31	18
3:00 PM	25	21	17	24	30	25	21
4:00 PM	29	26	27	31	22	15	20
5:00 PM	20	20	28	25	21	19	20
6:00 PM	25	21	24	26	16	18	18
7:00 PM	24	16	30	28	16	22	21
8:00 PM	23	21	22	23	18	21	22
9:00 PM	24	16	13	22	21	19	23
10:00 PM	18	17	21	24	17	21	22
11:00 PM	0	4	5	2	9	7	0
Daily Max.	29	37	30	31	31	34	28
Daily Total	295	289	293	312	298	299	284

Average Daily Volume: 296

Weekly Total: 2,070

Table 2. Maximum Queue at Drive-Through

Popeyes Louisiana Kitchen
1911 Indian Hill Boulevard, Pomona

	1/13	1/14	1/15	1/16	1/17	1/18	1/19
	MON	TUE	WED	THU	FRI	SAT	SUN
9:00 AM	0	0	0	1	1	0	3
10:00 AM	4	3	4	5	3	4	3
11:00 AM	5	5	4	4	5	5	5
12:00 PM	4	5	5	5	5	5	5
1:00 PM	5	5	5	3	6	5	4
2:00 PM	5	5	6	5	6	5	5
3:00 PM	5	5	6	5	5	5	5
4:00 PM	5	5	5	5	5	5	5
5:00 PM	4	5	5	5	5	5	5
6:00 PM	5	5	6	5	5	5	5
7:00 PM	5	5	6	5	5	5	5
8:00 PM	5	5	3	4	5	5	5
9:00 PM	5	5	5	5	5	5	5
10:00 PM	6	5	5	5	5	5	5
11:00 PM	0	4	4	2	5	5	5
Daily Max.	6	5	6	5	6	5	5

Appendix B: Comparable Drive-Through Operation at Covina

Table 1. Drive-Through Vehicle Volume

Popeyes Louisiana Kitchen
525 S. Citrus Ave, Covina

	1/6	1/7	1/8	1/9	1/10	1/11	1/12
	MON	TUE	WED	THU	FRI	SAT	SUN
10:00 AM	12	12	15	12	15	15	14
11:00 AM	30	31	27	29	27	31	21
12:00 PM	41	32	38	37	31	31	30
1:00 PM	36	27	35	39	30	35	26
2:00 PM	35	30	34	28	28	32	28
3:00 PM	28	28	35	30	28	31	28
4:00 PM	23	28	30	31	30	27	19
5:00 PM	28	32	22	26	28	19	19
6:00 PM	20	27	23	34	25	18	16
7:00 PM	22	32	29	35	28	18	12
8:00 PM	25	22	27	30	30	18	12
9:00 PM	29	30	24	34	27	27	19
10:00 PM	17	24	27	21	25	28	21
Daily Max.	41	32	38	39	31	35	30
Daily Total	346	355	366	386	352	330	265

Average Daily Volume: 343

Weekly Total: 2,400

Table 2. Maximum Queue at Drive-Through

Popeyes Louisiana Kitchen
525 S. Citrus Ave, Covina

	1/6	1/7	1/8	1/9	1/10	1/11	1/12
	MON	TUE	WED	THU	FRI	SAT	SUN
10:00 AM	3	3	2	2	4	5	4
11:00 AM	5	5	4	5	5	5	5
12:00 PM	4	5	4	5	4	6	5
1:00 PM	5	5	5	4	7	5	5
2:00 PM	7	5	5	6	9	5	5
3:00 PM	7	5	5	5	9	5	5
4:00 PM	6	5	5	5	7	6	5
5:00 PM	4	5	4	5	7	7	4
6:00 PM	5	6	5	5	6	5	4
7:00 PM	4	7	5	5	9	5	4
8:00 PM	4	6	6	5	9	5	5
9:00 PM	5	6	7	4	9	6	5
10:00 PM	4	7	7	5	9	7	5
Daily Max.	7	7	7	6	9	7	5

Appendix C: Comparable Drive-Through Operation at Huntington Beach

Table 1. Drive-Through Vehicle Volume

Popeyes Louisiana Kitchen
19102 Beach Blvd, Huntington Beach

	1/13	1/14	1/15	1/16	1/17	1/18	1/19
	MON	TUE	WED	THU	FRI	SAT	SUN
10:00 AM	6	4	15	10	7	8	9
11:00 AM	32	20	26	25	26	15	20
12:00 PM	41	37	26	38	28	29	24
1:00 PM	20	26	29	34	33	28	24
2:00 PM	22	29	23	17	28	21	24
3:00 PM	25	22	20	20	16	27	26
4:00 PM	27	23	21	22	24	22	24
5:00 PM	22	31	25	28	25	24	32
6:00 PM	26	21	28	28	29	31	29
7:00 PM	21	21	25	24	23	21	25
8:00 PM	19	19	23	23	24	23	19
9:00 PM	14	14	15	9	19	21	9
Daily Max.	41	37	29	38	33	31	32
Daily Total	275	267	276	278	282	270	265

Average Daily Volume: 273

Weekly Total: 1,913

Table 2. Maximum Queue at Drive-Through

Popeyes Louisiana Kitchen
19102 Beach Blvd, Huntington Beach

	1/20	1/21	1/22	1/23	1/24	1/25	1/26
	MON	TUE	WED	THU	FRI	SAT	SUN
10:00 AM	3	3	4	3	3	2	3
11:00 AM	4	4	3	4	4	4	4
12:00 PM	4	5	4	4	4	4	4
1:00 PM	4	4	3	4	4	4	4
2:00 PM	4	4	4	4	4	4	4
3:00 PM	4	4	4	4	3	4	4
4:00 PM	4	4	4	4	4	4	4
5:00 PM	4	4	4	4	5	4	4
6:00 PM	4	4	4	4	5	4	4
7:00 PM	4	4	4	4	3	4	5
8:00 PM	4	4	4	4	4	4	4
9:00 PM	3	4	3	3	5	4	3
Daily Max.	4	5	4	4	5	4	5