

Memorandum

Date: 24 June 2022
To: Lionel Uhry, Mar Ventures, Inc.
From: Ryan Liu, PE, & Anjum Bawa
Subject: **Raytheon Retail Project – Drive-Through Queuing Analysis**

LB22-0057

Fehr & Peers evaluated the relationship and potential conflicts between existing and proposed drive-through food and beverage serving land uses located within the Raytheon South Campus Phase 1 retail development (Nash Street Exchange) along the south side of El Segundo Boulevard between Continental Boulevard and Nash Street in El Segundo, California. The purpose of this memorandum is to help inform the developer team on potential queuing at the perimeter access point and internal aisles. Our analysis is based on current and expected demand of particular drive-through food/beverage establishments including Raising Cane's (existing), Panera Bread (future), and proposed Starbucks Coffee drive-through-only with no indoor seating (future).

Project Description

The Nash Street Exchange retail site and its associated off-site improvements are currently under construction, with some of the buildings already leased and/or in operation. **Figure 1** shows proposed site plan at buildout of Phase 1, also as described below:

- **Building 2160:** Raising Cane's Chicken Fingers – Open since January 2022 (dine-in, to-go, and drive-through)
- **Buildings 2140 & 2150:** Built and unoccupied as of March 2022, designated as 14,523 square feet of restaurant space (no drive-through)
- **Building 2130:** Built and unoccupied as of March 2022, to be occupied by Panera Bread (dine-in, to-go, drive-through)
- **Medical Office Building 2110:** Built and unoccupied as of March 2022, designated as 42,119 square feet of medical office space.
- **Building 2120:** Tentatively proposed to be a Starbucks location (walk-up and drive-through only)



The retail site offers vehicular access from three driveways, one from Continental Boulevard, one from Nash Street, and a signalized driveway on El Segundo Boulevard, midblock between Continental Boulevard and Nash Street. This traffic signal is currently under construction as of March 2022, but the driveway is already open and offers right-in/right-out driveway stop-controlled access only. Upon completion of the traffic signal, this driveway would function as a full-access intersection to El Segundo Boulevard, opposite an exit-only driveway serving development on the north side of the street.

Existing Conditions and Data Collection

Turning movement counts were reused from El Segundo South Campus Specific Plan Traffic Study (2013) for the Nash Street Exchange project.

Site visits were performed at the following comparable established Raising Cane's, Starbucks, and Panera Bread locations with drive-throughs during the PM peak period to document drive-through service times and queuing conditions.

- Raising Cane's – 4500 E Atherton Street, Long Beach, CA 90815
- Starbucks – 1775 Ximeno Avenue, Long Beach, CA 90815
- Panera Bread – 8900 Apollo Way, Suite A, Downey, CA 90242

Trip Generation and Distribution

Trip generation data published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual* (11th Edition, 2021) was used to determine trip estimates for all uses within the Nash Street Exchange. A series of adjustments were made to these trip estimates to account for proximity to the LA C Line El Segundo Station, and internal trips, and pass-by trips. No pass-by adjustments were made to trip generation to account for all vehicular traffic at project driveways and internal roadways. Localized trip distribution for these food service establishments was based on driveway observations and the proximity of other destinations such as residential neighborhoods. **Table 1** summarizes the trip generation for all land uses within the Nash Street Exchange. As shown under Table 1, without the pass-by credit associated with retail and restaurant uses, the site is expected to generate a total of 424 trips (205 inbound/219 outbound).

**TABLE 1
NASH STREET EXCHANGE
TRIP GENERATION FOR THE PURPOSE OF QUEUING ANALYSIS (NO PASS-BY CREDIT)**

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]								PM Peak Hour Trips		
			Daily Rate	AM Peak Hour			PM Peak Hour			Trip Rate Unit	In	Out	Total
				Rate	% In	% Out	Rate	% In	% Out				
PROPOSED PROJECT													
Medical Office	720	42.119 ksf	34.80	2.78	78%	22%	3.46	28%	72%	per ksf	41	105	146
<i>Internal capture [b]</i>			15%	15%			15%				(6)	(16)	(22)
<i>Transit credit [c]</i>			15%	15%			15%				(5)	(14)	(19)
Net Medical Office											30	75	105
Food Serving uses (Open after 10:00 AM)	932	14.523 ksf	107.20	0.00	0%	0%	9.05	61%	39%	per ksf	80	51	131
<i>Internal capture [b]</i>			5%	0%			25%				(20)	(13)	(33)
<i>Transit credit [c]</i>			5%	0%			5%				(3)	(2)	(5)
Net External Retail											57	36	93
Raising Cane's with Drive Through	934	3.493 ksf	467.48	44.61	51%	49%	33.03	52%	48%	per ksf	60	55	115
<i>Internal capture [b]</i>			10%	10%			10%				(6)	(6)	(12)
<i>Transit credit [c]</i>			5%	5%			5%				(3)	(2)	(5)
Net Trips											51	47	98
Panera Bread with Drive Through	934	4.170 ksf	467.48	44.61	51%	49%	33.03	52%	48%	per ksf	72	66	138
<i>Internal capture [b]</i>			10%	10%			10%				(7)	(7)	(14)
<i>Transit credit [c]</i>			5%	5%			5%				(3)	(3)	(6)
Net Trips											62	56	118
Starbucks Coffee Drive-Through Only (No Indoor Seating)	938	1 Ln	179.00	39.81	50%	50%	15.08	50%	50%	per lane	8	7	15
<i>Internal capture [c]</i>			25%	25%			25%				(2)	(2)	(4)
<i>Transit credit [c]</i>			5%	5%			5%				(1)	0	(1)
Net Trips											5	5	10
Total Driveway Trips for Queuing Analysis Purposes											205	219	424

Notes:

- a. Source: Institute of Transportation Engineers (ITE), *Trip Generation, 11th Edition*, 2021, unless otherwise noted.
- b. Internal capture represents the percentage of trips occurring between land uses proposed or already operating within the site (Raytheon South Campus).
- c. Trip generation adjustment discount associated with proximity to transit service for similar sites based on recommendations published by Los Angeles County Metropolitan Transportation Authority (Metro) and ITE.

Exhibit 1

NEW PROPOSED COFFEE SHOP

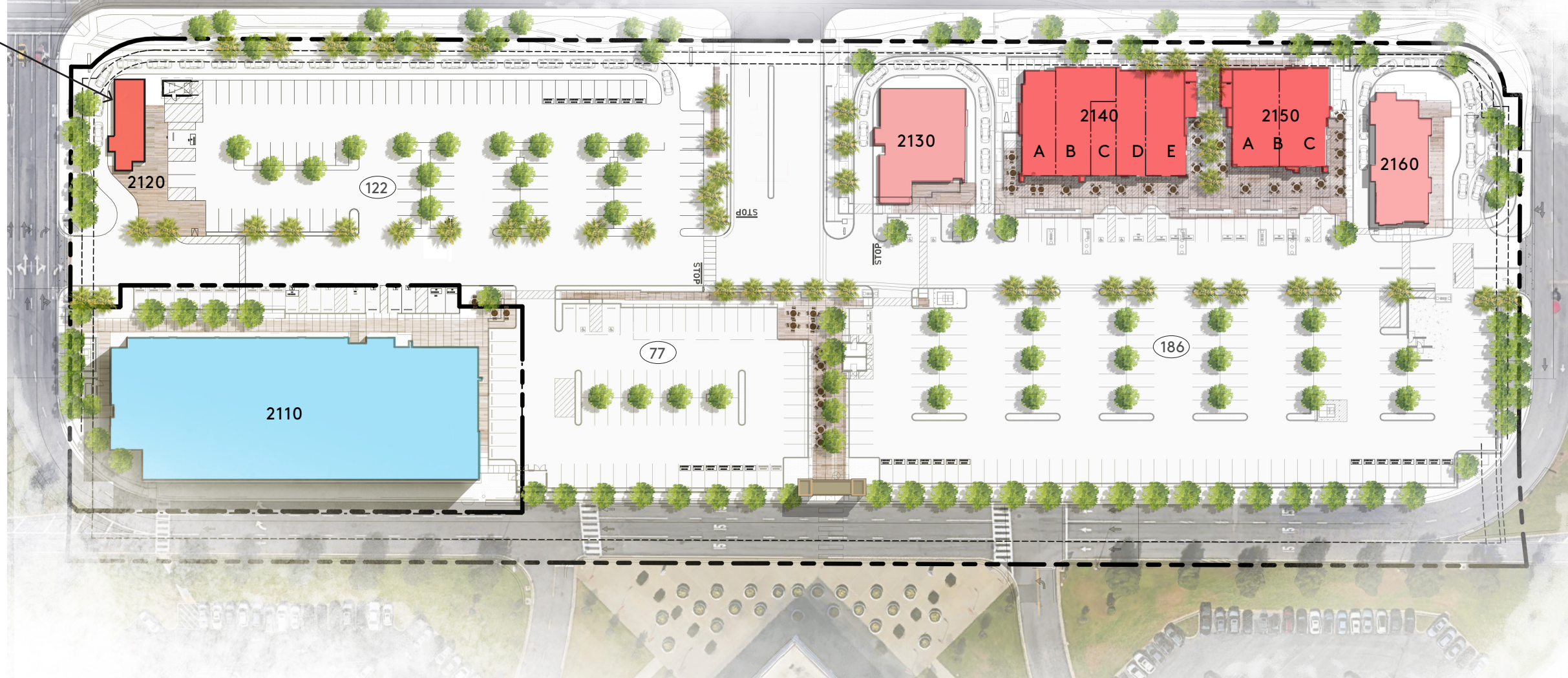
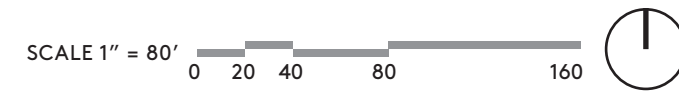


Figure 1



		GROSS BUILDING SF	NET BUILDING SF	NON-USABLE SF	PROVIDED PATIO SF	*EXCLUDED PATIO SF	PARKING PER SF	STALLS REQUIRED
BLDG 2110	MEDICAL OFFICE (2 levels)	42,119	40,450				200	202.3
BLDG 2120	STARBUCKS	1,130	998		145	145	130	7.7
PAD 2130	FAST FOOD	3,800	3,756		370	200	130	28.9
BLDG 2140	RESTAURANT	7,857						
	TENANT A		1,590	60	350	200		
	TENANT B		2,018	75	200	200		
	TENANT C		798	30	200	200		
	TENANT D		1,346	50	200	200		
	TENANT E		1,822	68	700	200		
BLDG 2140 SUBTOTAL			7,574	283			130	58.3
BLDG 2150	RESTAURANT	4,333						
	TENANT A		1,994	100	500	200		
	TENANT B		2,139	100	581	200		
BLDG 2150 SUBTOTAL			4,133	200			130	31.8
PAD 2160	FAST FOOD	2,798	2,798		695	200	130	21.5
PATIO TOTAL	DINING (>200sf/tenant)				3,941	1,945	75	26.6

TOTAL REQUIRED 377.0
 TOTAL PROVIDED 385.0
 SURPLUS/DEFICIT 8.0
 Parking provided ratio- stalls / 1000 Gross SF 6.2

*First 200 sf of patio space does not count towards area tabulation

Required restaurant parking based on 60% kitchen (at 250 sf) and 40% dining (at 1 per 75 sf), equals 1 per 130 sf blended rate



Drive-Through Operations Analysis

To conduct a comprehensive queuing analysis and simulate traffic conditions upon the buildout of the site plan, we developed evening (PM) peak hour microsimulation models using the VISSIM 22 software. The microsimulation models allowed us to evaluate the operations and interactions between all three drive-through restaurants, other Nash Street Exchange uses, and the following perimeter signalized intersections:

- Continental Boulevard & El Segundo Boulevard
- Nash Street Exchange Driveway & El Segundo Boulevard
- Nash Street & El Segundo Boulevard

The simulation models were developed to be consistent with the Highway Capacity Manual, 6th Edition (HCM) and the FHWA Guidelines for Applying Traffic Microsimulation Modeling Software (2019) using the flow chart shown on **Exhibit A**. The models were calibrated to match conditions observed in the field to the extent feasible. Traffic signal timings were informed by prior studies and field observations.

We evaluated drive-through operations for Future plus Project conditions. This scenario takes into account all other background growth and related projects in the area, and incorporates the trips associated with each use within the Nash Street Exchange project. **Table 2** shows the maximum expected queues associated with each drive-through restaurant.

These maximum queues represent a worst-case scenario that is not expected to occur frequently. There is also no benchmark for what level of queuing would constitute a safety hazard or unacceptable condition. Based on this analysis, each drive-through restaurant as proposed would be able to accommodate its expected demand within its footprint during the PM peak hour. Based on the trip generation and each restaurant's operating hours and characteristics, restaurants such as Raising Cane's are busiest during lunchtime and dinnertime. Panera Bread would be busiest during the AM peak period and lunchtime, while Starbucks is typically busiest during the AM peak period. Because each restaurant would be busiest at different times and serve different types of customers, we estimate that all three establishments can operate on the same site without queues spilling back onto circulating roadways and the public right-of-way. If there are instances where drive-through demand exceeds drive-through lane storage, other areas of the retail parking lot are available to accommodate drive-through vehicles to avoid obstructing internal and external circulation.



Figure 2 – VISSIM Model Development Flow Chart

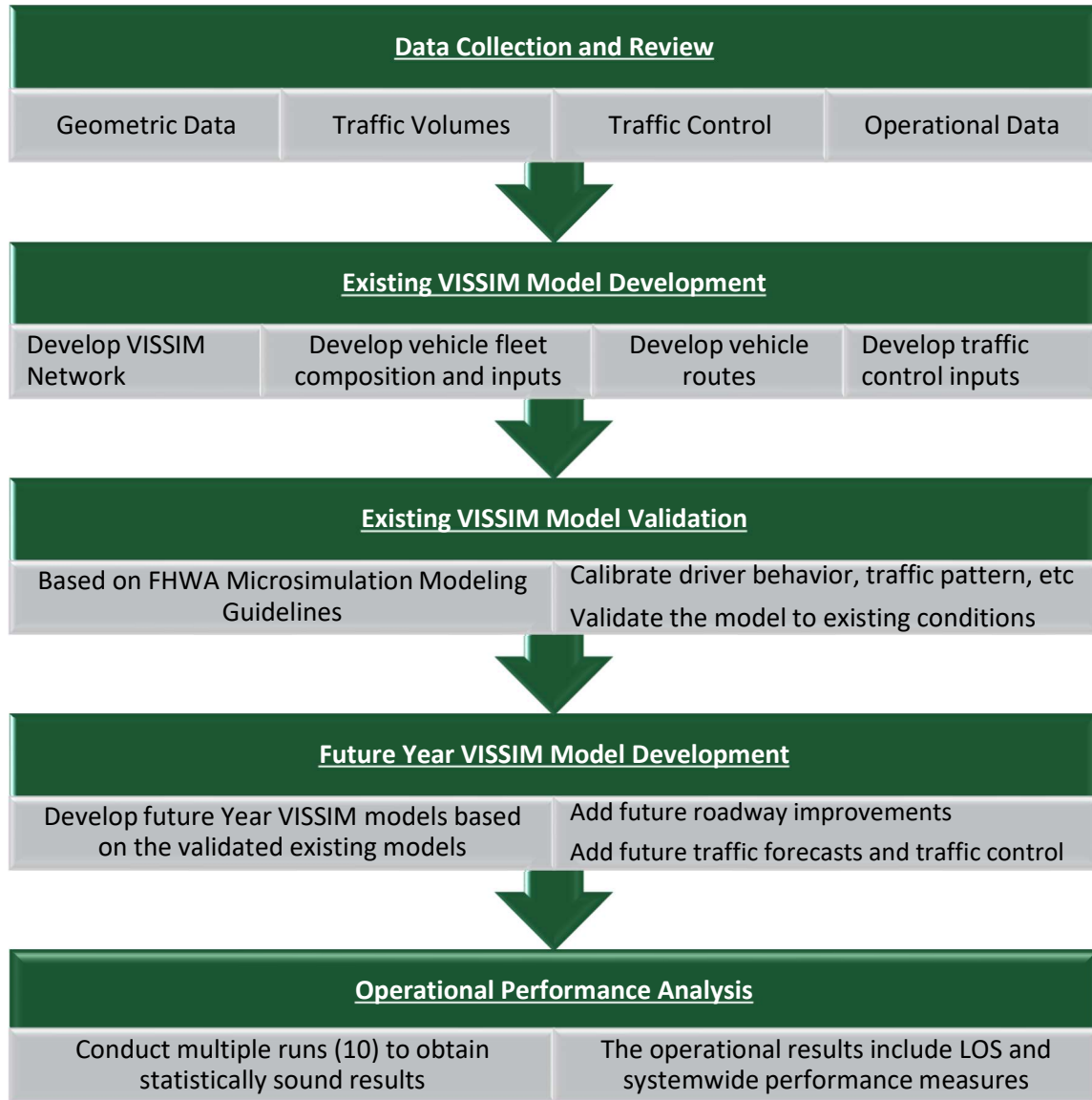


Table 2: Future with Project Drive-Thru Queuing

Drive-Thru	Drive-Through Lane Storage Length (ft) ¹	Future with Project PM Peak Hour	
		Average Queue (ft) ²	Maximum Queue (ft) ²
Raising Cane's (left lane)	75	25	50
Raising Cane's (right lane)	75	25	50
Starbucks Coffee	330	25	25
Panera Bread	80	50	100

Note: ¹ Storage length calculated as the distance from ordering speaker to drive-through entrance.

² Queues rounded up to the nearest 25 feet, or the typical length of a queued vehicle.