

March 10, 2021

Ms. Nicole Morse
T&B Planning, Inc.
3200 El Camino Real, Suite 100
Irvine, CA 92602

SUBJECT: 534 STRUCK AVENUE TRAFFIC ASSESSMENT

Dear Ms. Nicole Morse:

This letter has been prepared to document the findings for the Traffic Assessment for the proposed 534 Struck Avenue development (**Project**) located in the City of Orange. It is our understanding that the Project is to consist of a 57,900 square foot building with truck terminal use, which would replace the existing 40,000 square foot manufacturing use. It should be noted that this traffic assessment has been prepared in accordance with the City of Orange Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment (City Guidelines) (July 2020).

PROPOSED PROJECT

The preliminary site plan for the proposed Project is shown on Exhibit 1. The proposed Project is to consist of a 57,900 square foot building with truck terminal use. The building is proposed to have 42 dock doors on the west side and 43 dock doors on the east side for a total of 85 dock doors. The Project is anticipated to be constructed in one phase by the year 2022. Access to the Project site will be provided by two proposed driveways along Struck Avenue. Both driveways will serve passenger cars and heavy trucks.

TRIP GENERATION ASSESSMENT

EXISTING USE

Trip generation rates for the existing use are shown on Table 1. The trip generation rates used for this analysis is based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their Trip Generation Manual (10th Edition, 2017). For purposes of the trip generation assessment, the following ITE land use codes and vehicle mixes have been utilized for the existing and proposed uses (see Table 1):

- ITE land use code 140 (Manufacturing) has been used to derive the existing trip generation estimates for up to 40,000 square feet. A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one

facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research, and associated functions. The ITE Trip Generation Manual includes very limited data regarding the types of vehicles that are generated for manufacturing uses (passenger cars and various sizes of trucks). As such, data regarding the vehicle mix has been obtained from a separate report: the City of Fontana's Truck Trip Generation Study (August 2003) for the manufacturing uses. The "Manufacturing" vehicle mix data has been utilized: 3.46% 2-axle trucks, 4.64% 3-axle trucks, and 12.33% 4+-axle trucks (total of 20.43% trucks).

TABLE 1: TRIP GENERATION RATES

Land Use ¹	ITE LU Code	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Manufacturing ³	140	TSF	0.477	0.143	0.620	0.208	0.462	0.670	3.930
Passenger Cars			0.380	0.113	0.493	0.165	0.368	0.533	3.127
2-Axle Trucks			0.017	0.005	0.021	0.007	0.016	0.023	0.136
3-Axle Trucks			0.022	0.007	0.029	0.010	0.021	0.031	0.182
4+-Axle Trucks			0.059	0.018	0.076	0.026	0.057	0.083	0.485

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

² TSF = Thousand Square Feet

³ Vehicle/Truck Mix Source: City of Fontana's Truck Trip Generation Study (August 2003).

The site is currently occupied by 40,000 square feet of manufacturing use. Access to the Project site is currently provided by three existing driveways on Struck Avenue. The trip generation summary illustrating daily, and peak hour trip generation estimates for the proposed Project are shown on Table 2 for the existing 40,000 square feet of manufacturing use. As shown on Table 2, the existing site is currently generating 160 trip-ends per day with 25 AM peak hour trips and 27 PM peak hour trips.

TABLE 2: EXISTING TRIP GENERATION

Existing Land Use	Quantity Units ¹	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Manufacturing	40,000 TSF							
Passenger Cars:		15	5	20	7	15	22	126
2-axle Trucks:		1	0	1	0	1	1	6
3-axle Trucks:		1	0	1	0	1	1	8
4+-axle Trucks:		2	1	3	1	2	3	20
Total Truck Trips:		4	1	5	1	4	5	34
Total Trips (Actual Vehicles)²		19	6	25	8	19	27	160

¹ TSF = thousand square feet

² Total Trips = Passenger Cars + Truck Trips.

PROPOSED PROJECT

The Project is proposing to redevelop the site with a 57,900-square foot, 45-foot-tall truck terminal, including 52,900-square feet of warehouse space and 5,000-square feet of office uses (see Exhibit 1). The Project would construct 62 passenger car parking stalls (including 3 accessible parking spaces) and 190 trailer parking stalls (for a total of 152 parking stalls) on-site. The building is proposed to include 85 dock doors (cross-dock configuration). Vehicular access to the site would be provided via two driveways along the site's northern boundary on Struck Avenue.

Due to the unique nature of the proposed Project, trip generation rates for the proposed Project have been developed. The sites that were specifically chosen are very similar in nature to the proposed use at 534 Struck Avenue. 700 Eckhoff Street in Orange is a competitor of the proposed tenant with the same operation and was chosen because of the close proximity to the proposed project. The site located at 2550 E. 28th Street in Vernon is currently occupied by the proposed tenant with the exact use/operation that will be occupying the proposed Project site, pending approval. In order to calculate a rate for the Project that most closely reflects the anticipated operations, the following 2 local sites were surveyed over 2 days to develop an average trip generation rate:

- 700 Eckhoff Street, Orange, California: November 10 & 12, 2020
- 2550 E. 28th Street, Vernon, California: November 24 & 25, 2020

Traffic counts were collected at the driveways for 700 Eckhoff Street in Orange, California on November 10 and 12, 2020. A summary of the count data collected over the 2 days is provided in Attachment A. Table A-1 in Attachment A provides a detailed summary of the counts collected on each day at each driveway location. Table A-2 in Attachment A provides the total trip generation for the site for each day and also shows the average 2-day trip generation. The average 2-day trip generation was then divided by the number of dock doors (95 dock doors) to develop the trip generation rates for the 700 Eckhoff Street site (see Attachment A, Table A-3).

Similarly, traffic counts were collected at a second location at 2550 E. 28th Street in Vernon, California on November 24 and 25, 2020. A summary of the count data collected over the 2 days is provided in Attachment B. Table B-1 in Attachment B provides a detailed summary of the counts collected on each day at each driveway location. Table B-2 in Attachment B provides the total trip generation for the site for each day and also shows the average 2-day trip generation. The average 2-day trip generation was then divided by the number of dock doors (80 dock doors) to develop the trip generation rates for the 2550 E. 28th Street site (see Attachment B, Table B-3).

The number of dock doors has been utilized as the independent variable in calculating the trip generation rates as opposed to square footage since the proposed building is not intended to be used for the storage of materials. The trip generation for a truck terminal facility could be better correlated to the number of dock doors due to the truck activity associated with the transfer of goods.

Table 3 presents the trip generation rates calculated for the proposed truck terminal use based on an average of data collected at the 2 sites located at 700 Eckhoff Street and 2550 E. 28th Street. The data collected at the 2 sites indicates most of the truck activity occurs outside of the typical morning and evening peak hours (7-9 AM and 4-6 PM).

TABLE 3: TRIP GENERATION RATES FOR TRUCK TERMINAL USE

Land Use	Units ¹	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Truck Terminal ²	DD							
Passenger Cars:		0.108	0.067	0.175	0.065	0.036	0.101	1.868
2-axle Trucks:		0.000	0.006	0.006	0.006	0.000	0.006	0.190
3-axle Trucks:		0.006	0.012	0.017	0.058	0.017	0.075	0.570
4+-axle Trucks:		0.012	0.029	0.040	0.029	0.023	0.052	0.990

¹ DD = Dock Doors

² Trip generation rates based on average of 2-day trip generation rates calculated for 700 Eckhoff St. & 2550 E. 28th St. sites.

Based on the trip generation rates shown in Table 3, the Project trip generation has been calculated and is shown in Table 4. As shown in Table 4, the proposed Project is anticipated to generate 308 two-way daily trips with 19 AM peak hour trips and 19 PM peak hour trips.

TABLE 4: PROPOSED PROJECT TRIP GENERATION SUMMARY

Proposed Land Use	Quantity Units ¹	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Truck Terminal:								
Proposed Project: 534 Struck	85 DD							
Passenger Cars:		9	6	15	6	3	9	160
2-axle Trucks:		0	0	0	0	0	0	16
3-axle Trucks:		0	1	1	5	1	6	48
4+-axle Trucks:		1	2	3	2	2	4	84
Total Truck Trips:		1	3	4	7	3	10	148
Proposed Project Total		10	9	19	13	6	19	308

¹ DD = dock doors

TRIP GENERATION COMPARISON

Table 5 shows the trip generation comparison and the resulting net change in trips between the existing use and the proposed Project. As shown on Table 5, the proposed Project would result in a net increase of 148 trip-ends per day and net decrease of 6 AM peak hour trips and 8 PM peak hour trips.

TABLE 5: TRIP GENERATION COMPARISON

Proposed Land Use	Quantity Units ¹	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Manufacturing (Exisitng)	40.000 TSF							
Passenger Cars:		15	5	20	7	15	22	126
Total Truck Trips:		4	1	5	1	4	5	34
Total Trips²		19	6	25	8	19	27	160
Truck Terminal (Proposed)	85 DD							
Passenger Cars:		9	6	15	6	3	9	160
Total Truck Trips:		1	3	4	7	3	10	148
Total Trips²		10	9	19	13	6	19	308
VARIANCE								
Passenger Cars:		-6	1	-5	-1	-12	-13	34
Total Truck Trips:		-3	2	-1	6	-1	5	114
Total Trips²		-9	3	-6	5	-13	-8	148

¹ TSF = thousand square feet; DD = dock doors

² Total Trips = Passenger Cars + Truck Trips.

According to the City's Traffic Impact Analysis Guidelines, a Traffic Study may not be required if the AM or PM peak hour trip generation is less than 100 vehicle trips, the project would generate less than 1,600 trip-ends per day, and the project would contribute less than 51 peak hour trips to any intersection during the AM and PM peak hours. Based on the City's traffic study guidelines and the anticipated net new trips for the site, additional traffic analysis beyond the trip generation assessment is not necessary.

TRAFFIC INDEX CALCULATIONS

The Traffic Index (TI) is a measure of the deteriorating effects that heavy trucks have on asphalt concrete pavement. The Project's Civil Engineer shall prepare an existing TI Calculation for Struck Avenue, east of N. Batavia Street. In addition, the Project Applicant is requested to make a commitment to update the TI calculation every 6 months.

Ms. Nicole Morse
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ON-STREET PARKING REMOVAL

It is requested that the Project Applicant submit a request to the City's Traffic Commission in order to remove the on-street parking within the cul-de-sac of Struck Avenue adjacent to the property. If you have any questions or comments, I can be reached at (949) 861-0177.

URBAN CROSSROADS, INC.



Charlene So, PE
Associate Principal

Attachments

EXHIBIT 1: PRELIMINARY SITE PLAN

