



SM ROCHA, LLC

TRAFFIC AND TRANSPORTATION CONSULTANTS

August 14, 2019

Mark Perrino
Twin Star Energy, LLC
7671 Shaffer Parkway
Littleton, Colorado 80127

**RE: Quincy & Buckley 7-Eleven / Traffic Generation Analysis
Aurora, Colorado**

Dear Mark,

SM ROCHA, LLC is pleased to provide traffic generation information for the development entitled Quincy & Buckley 7-Eleven. This development is located on the south side of Quincy Avenue between Buckley Road and Pitkin Street in Aurora, Colorado.

The intent of this analysis is to present traffic volume likely generated by the proposed development, provide a traffic volume comparison to the existing land use, and consider potential impacts to the adjacent roadway network.

The following is a summary of analysis results.

Site Description and Access

Land for the development is currently occupied by an existing gas station with convenience store of approximately 1,000 square feet, 8 vehicle fueling positions, and a car wash facility. The proposed re-development is understood to include a gas station with convenience store of approximately 3,200 square feet, 12 vehicle fueling positions, and car wash facility. The site is surrounded by a mix of commercial, and residential land uses.

Development site traffic is primarily accommodated by one full-movement on Quincy Avenue. Potential alternative access locations are also present as part of the overall commercial development area the site is a part of. All access drives are existing and operate as stop-controlled intersections.

General site and access locations are shown on Figure 1.

A conceptual site plan, as prepared by Entitlement and Engineering Solutions, Inc., is shown on Figure 2. This plan is provided for illustrative purposes.



Google Earth

Figure 1
SITE LOCATION

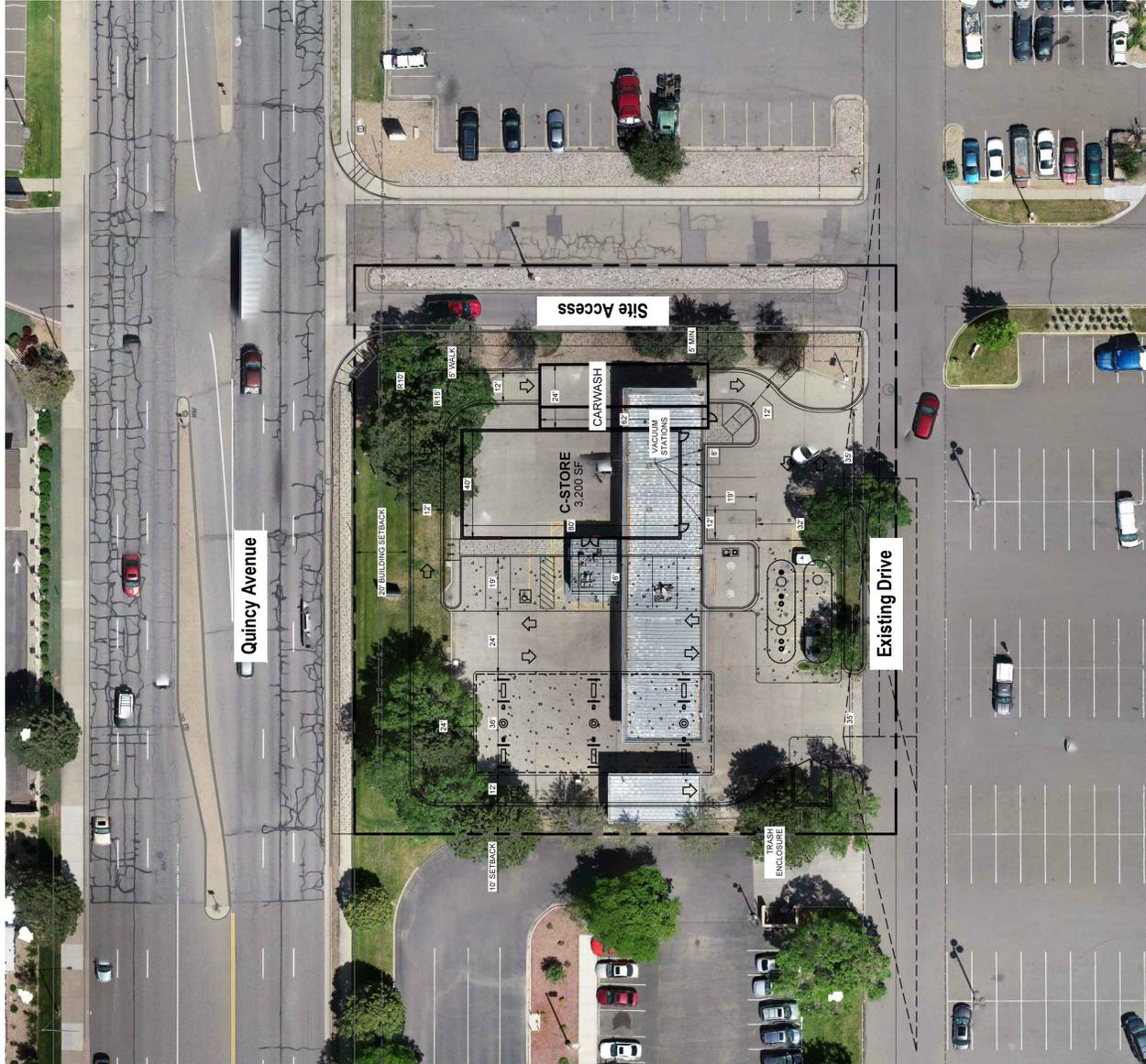
QUINCY & BUCKLEY 7-ELEVEN
Traffic Generation Analysis

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Not to Scale



QUINCY & BUCKLEY 7-ELEVEN
Traffic Generation Analysis

Figure 2
SITE PLAN

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August 2019
 Page 3

Vehicle Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation, 10th Edition, was applied to the existing and proposed land uses in order to estimate the average daily traffic (ADT) and peak hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from point of origin to point of destination.

Table 1 presents average trip generation rates for the existing and proposed development areas. Use of average trip generation rates presents a conservative analysis. ITE land use codes 945 (Gasoline with Convenience Market) and 948 (Automated Car Wash) were used for analysis because of their best fit to existing and proposed land uses.

TABLE 1 TRIP GENERATION RATES									
ITE CODE	LAND USE	UNIT	TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
945	Gasoline w/Convenience Market	VFP	205.36	6.36	6.11	12.47	7.13	6.86	13.99
948	Automated Car Wash	KSF	142.00	*	*	*	7.10	7.10	14.20

Key: VFP = Vehicle Fueling Positions. KSF = Thousand Square Feet Gross Floor Area.
 * = ITE does not report significant AM peak hour generation due to the nature of the business (ie, operating hours typically open after AM peak).
 Note: All data and calculations above are subject to being rounded to nearest value.

Table 2 summarizes the projected ADT and peak hour traffic volumes likely generated by the land use area proposed and provides comparison to traffic volume estimates of existing land use.

TABLE 2 TRIP GENERATION SUMMARY									
ITE CODE	LAND USE	SIZE	TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
<u>Site Development - Existing</u>									
945	Gasoline w/Convenience Market	8 VFP	1,643	51	49	100	57	55	112
948	Automated Car Wash	0.6 KSF	85	*	*	*	4	4	9
<i>Existing Total:</i>			1,728	51	49	100	61	59	120
<u>Site Development - Proposed</u>									
945	Gasoline w/Convenience Market	12 VFP	2,464	76	73	150	86	82	168
948	Automated Car Wash	1.5 KSF	213	*	*	*	11	11	21
<i>Proposed Total:</i>			2,677	76	73	150	96	93	189
Total Additional Trips:			949	25	24	50	35	34	69

Note: All data and calculations above are subject to being rounded to nearest value.

As Table 2 shows, the proposed development area has the potential to generate approximately 949 additional daily trips with 50 of those occurring during the morning peak hour and 69 during the afternoon peak hour.

Adjustments to Trip Generation Rates

While a development of this type is likely to attract trips from within area land uses as well as pass-by or diverted link trips from the adjacent roadway system, no trip reduction was taken in this analysis. This assumption provides for a conservative analysis.

As example, published ITE pass-by and diverted link trip data indicates an average trip generation reduction rate between 50 and 85 percent as typical to service stations with convenience store. Considering the lowest reduction percentage, primary trip generation for the proposed development equates to half of trip generation volumes presented in Table 2. A primary trip is defined by ITE as a trip made for the specific purpose of visiting the destination generator.

Trip Generation Distribution and Assignment

Overall directional distribution of site-generated traffic was determined based on existing area land uses, the site location within the City, and the available roadway network. Site-generated traffic is anticipated to be distributed through each existing access. Distribution along Quincy Avenue is general and assumed to be 50 percent to/from the east and 50 percent to/from the west.

Traffic assignment is how the site-generated and distributed trips are expected to be loaded on the roadway network. Applying assumed trip distribution patterns to site-generated traffic provides the peak hour trip volume assignments for existing accesses. These volumes are then divided further upon travel through adjacent roadways serving the overall development area. The table below uses the trip generation volumes from Table 2 and denotes the projected additional traffic volumes at the existing access.

Development Site Access	AM Peak Hour Inbound Volume	AM Peak Hour Outbound Volume	PM Peak Hour Inbound Volume	PM Peak Hour Outbound Volume
Access on Quincy Avenue				
<i>Eastbound Right</i>	13	N/A	18	N/A
<i>Westbound Left</i>	12	N/A	17	N/A
<i>Northbound Left</i>	N/A	12	N/A	17
<i>Northbound Right</i>	N/A	12	N/A	17

Development Impacts

As Table 2 shows, there is an increase in peak hour traffic volumes anticipated for the proposed development and are considered minor. These minor volumes are not likely to negatively impact operations of Quincy Avenue or other adjacent roadways or intersections.

Conclusion

This analysis assessed traffic generation for the Quincy & Buckley 7-Eleven development, provided a traffic volume comparison to existing land uses, and considered potential impacts to the adjacent roadway network.

It is our professional opinion that the proposed site-generated traffic is expected to create no negative impact to traffic operations for the surrounding roadway network and existing site access, nor at the Quincy Avenue intersection with Buckley Road. Analysis of site-generated traffic concludes that proposed development traffic volume is minor.

We trust that our findings will assist in the planning and approval of the Quincy & Buckley 7-Eleven development. Please contact us should further assistance be needed.

Sincerely,

SM ROCHA, LLC
Traffic and Transportation Consultants



Stephen Simon, EIT
Traffic Engineer



Fred Lantz, PE
Traffic Engineer