



Date: January 4, 2020

To: Robert Schneeberg, PE, RPLS
Gonzalez & Schneeberg, Engineers & Surveyors, Inc.

From: Derek Sweeney, PE

Re: Lewisville VFW Post 9168 - Right-turn Lane Analysis

INTRODUCTION

The purpose of this memo is to examine the need for a right-turn lane based on expected peak hour traffic volumes generated by the proposed VFW Post 9168 development on Lot 1 and the adjacent warehouse development on Lot 2 of the Peck V.R. Addition site located northeast of the intersection of Valley Ridge Boulevard and N. Mill Street in Lewisville, Texas. This site will share a driveway (Site Driveway) with another lot, which is to be used for a warehouse. The proposed square footage of the VFW post is approximately 4,400 square feet, and the proposed square footage of the warehouse is 5,000 square feet.

It is our understanding that the City of Lewisville may be willing to waive the right-turn lane requirement for this driveway if it can be shown that the turn lane is not warranted based on the anticipated traffic volumes.

PROPOSED SITE TRAFFIC

TRIP GENERATION

Estimated vehicle trip ends to and from the development were calculated utilizing trip generation rates and characteristics collected and compiled by the Institute of Transportation Engineers (ITE) in the tenth edition of their *Trip Generation Manual*. While there is no specific land use within the *ITE Trip Generation Manual* which exactly matches the proposed use of a VFW post, the “Drinking Place” (ITE Code 925) land use was identified as being the most similar for the purposes of analysis. ITE defines the “Drinking Place” land use as follows:

“A drinking place contains a bar, where alcoholic beverages and food are sold, and possibly some type of entertainment, such as music, television screens, video games, or pool tables. Establishments that specialize in serving food but also have bars are not included in this land use.”

Despite not being an exact match, the “Drinking Place” land use shows a similar peak hour to what might be expected of a VFW post, and will allow for a reasonable estimation of traffic volumes during the afternoon peak hour. The “Quality Restaurant” (ITE Code 931) land use was also considered but the land use definition did not align as well to the VFW development and also resulted in less trips generated during the afternoon peak hour than the “Drinking Place” land use.

The warehouse was analyzed using the Warehousing (ITE Code 150) land use.

Table 1 has been prepared to summarize the associated trip generation data and the calculated trips that are anticipated to be generated by the proposed sites during a typical weekday evening. Only the weekday PM Peak hour was analyzed, as this will be the period with the highest volume of traffic on the site driveway. Copies of the ITE data sheets used to develop **Table 1** have been included in the Appendix.

Table 1. Trip Generation Data

Land Use	Size	PM Peak (vph)		
		Total	Enter	Exit
Drinking Place	4,400 SF	68	46	22
Warehousing	5,000 SF	28	7	21
Total	-	96	53	43

TRIP DISTRIBUTION

The site plan shows that the Site Driveway will not be provided with a median opening and thereby be limited to right-in, right-out operations. While the site plan also shows the internal roadway connecting the four lots together, it is our understanding that gate will be provided to prevent cross-access to/from the full Site Driveway and Lots 1 and 2.

For these reasons, it was assumed that 100% of entering vehicles will be right-turning into the Site Driveway and 100% of exiting vehicles will be right-turn out of the Site Driveway.

RIGHT-TURN LANE ANALYSIS

Texas Department of Transportation (TxDOT)'s requirements, as described in their *Access Management Manual (AMM)*, were used to evaluate whether right-turn deceleration lanes are needed for this site. While Valley Ridge Boulevard is not a TxDOT facility, TxDOT's access management requirements are often used as a standard where local requirements for turn lanes do not provide a threshold based on turning volumes.

Table 2-3 in the *AMM* describes the TxDOT approach for analyzing the need for right-turn only lanes. That publication indicates the following threshold values: 50 right turning vehicles per hour when the posted speed limit exceeds 45 mph; and 60 right turning vehicles per hour when the posted speed limit is 45 mph or less. **Table 2** has been prepared to summarize the results of the analyses.

Table 2. TxDOT Right-turn Lane Analysis

Analysis Period		Projected Right-turn Volume	Required Right-turn Volume	Meets Criteria
Site Driveway at Valley Ridge Boulevard (40 mph)				
Full Build	PM Peak	53	60	No

As seen in **Table 2**, the projected volumes for the site driveway do not warrant consideration of a right-turn lane under TxDOT requirements.

CITY OF LEWISVILLE REQUIREMENTS

The City of Lewisville Code of Ordinances Ch. 6, Article V. Sec. 6-103(e) addresses auxiliary lanes, including right-turn deceleration lanes, as part of the access management policy. Specifically, Section 6-103(e)(3) appears to apply to this project which states the following;

“Existing platted lots or unplatted stand-alone tracts proposed for commercial use with less than 300 feet of street frontage and at least 225 feet of street frontage, located mid-block and away from street intersections and requiring a right turn/deceleration lane will provide at minimum a modified deceleration lane measuring 170 feet (60 feet of storage and a 110-foot taper)...”

Our office was provided a copy of your letter to Mr. Tim Ippolito with the City of Lewisville dated November 13, 2019 which requested a waiver of this requirement and instead requested that Section 6-103(e)(4) be applied instead which states the following:

“Existing platted lots or unplatted stand-alone tracts proposed for commercial use with less than 225 feet of street frontage, no provision to acquire additional street frontage and normally requiring a right turn/deceleration lane will be exempt from the deceleration lane requirements except that a minimum turn-in radius of 40 feet will be required.”

We concur with the waiver request and note that the site plan shows the necessary 40 ft. turn-in curb radius at the Site Driveway. The increases radius will allow vehicles to enter the Site Driveway at slightly higher speeds reducing disruption to through traffic on Valley Ridge Boulevard.

CONCLUSIONS AND RECOMMENDATIONS

Per City of Lewisville ordinance requirements, a right-turn lane is required for the proposed Site Driveway. However, the traffic volumes at the Site Driveway do not meet TxDOT requirements for consideration of a right-turn lane. As such, we concur and support the waiver request to forego the required right-turn lane and instead provide a 40 ft. turn-in curb radius based on the stated land uses and intensities.

Please do not hesitate to contact our office should you have any questions or comments concerning this memo.

APPENDIX

PRELIMINARY SITE LAYOUT 1 PAGE

ITE TRIP GENERATION SHEETS..... 2 PAGES

Drinking Place (925)

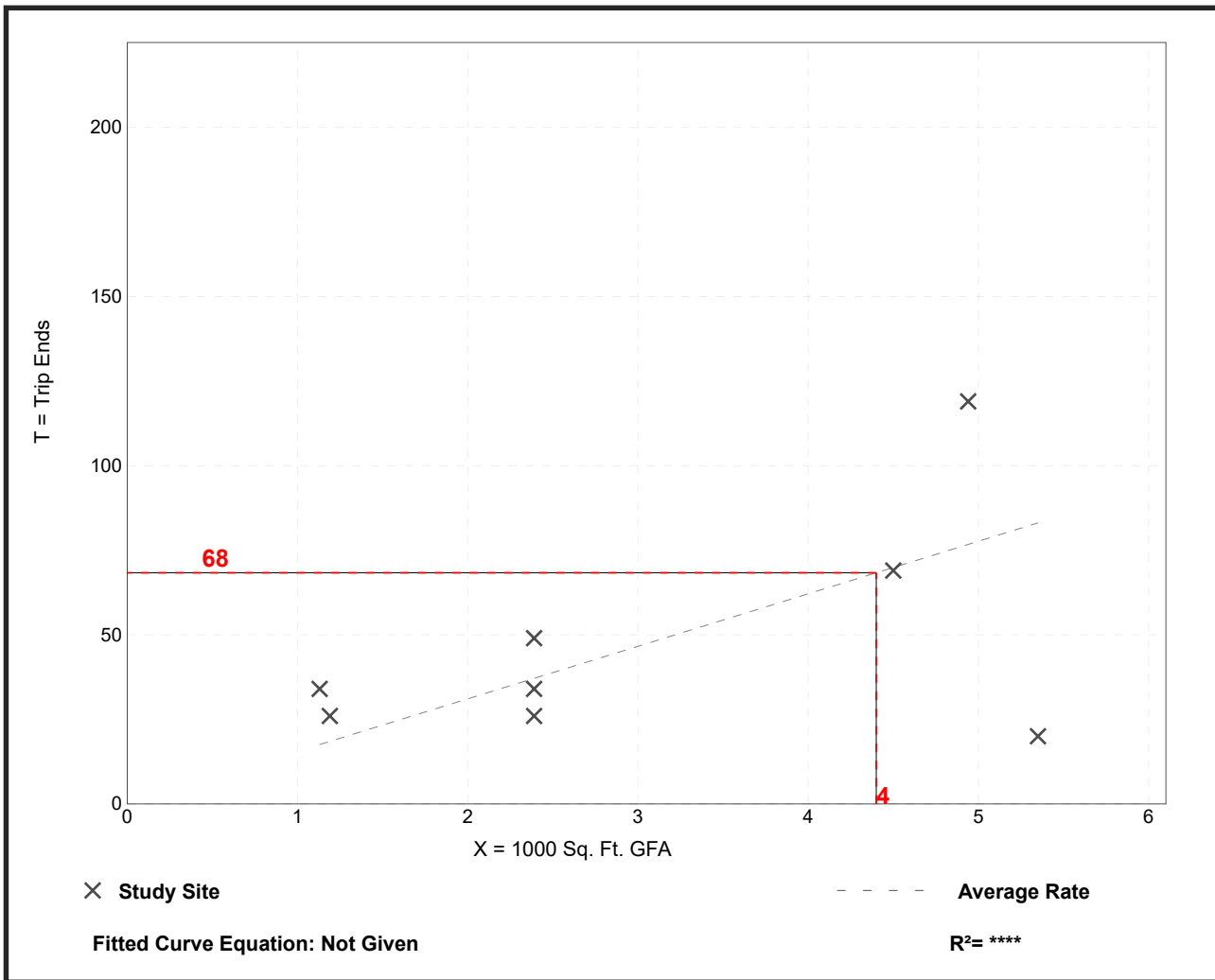
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 8
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 68% entering, 32% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
15.53	3.74 - 30.09	8.42

Data Plot and Equation



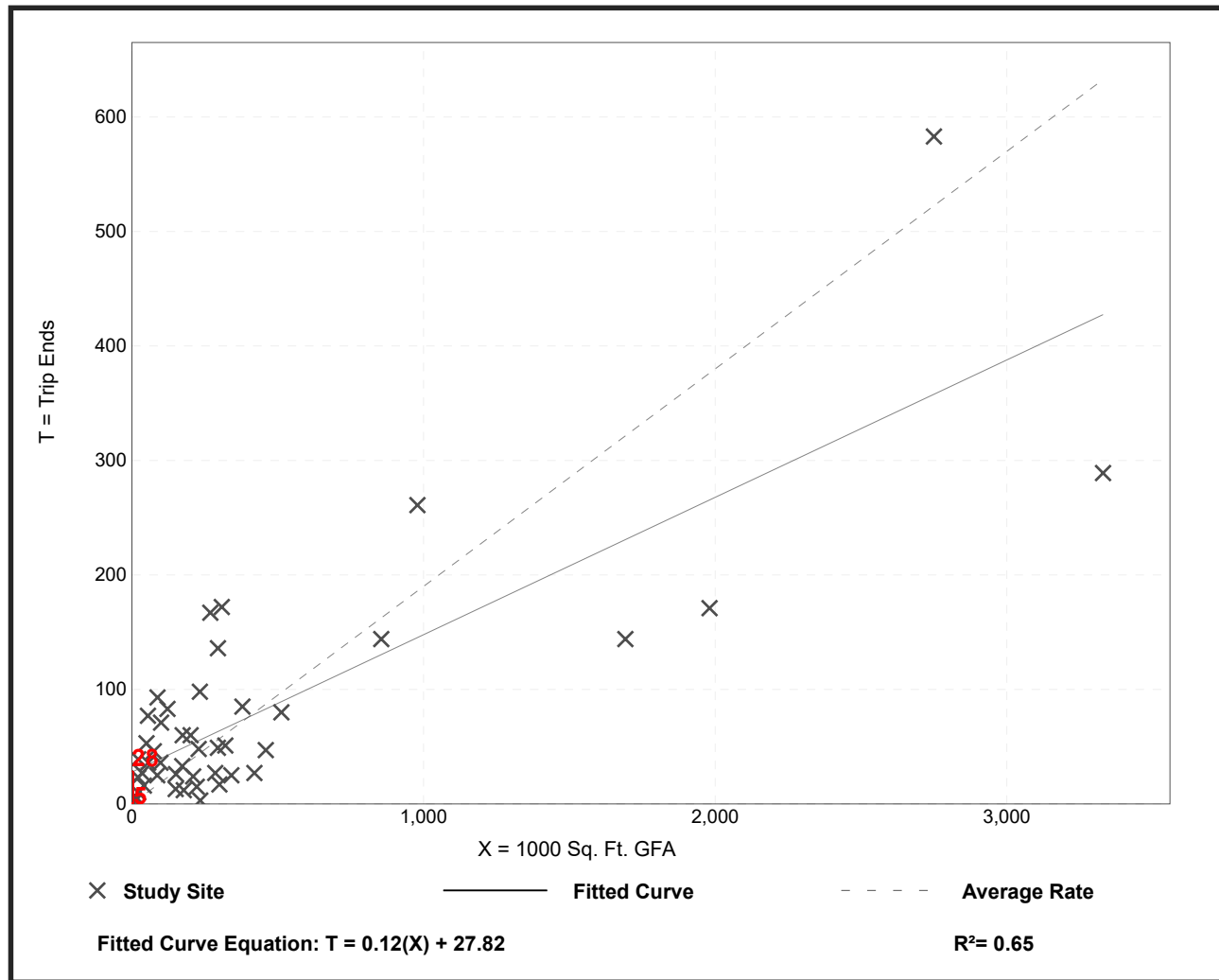
Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 47
 Avg. 1000 Sq. Ft. GFA: 400
 Directional Distribution: 27% entering, 73% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.19	0.01 - 1.80	0.18

Data Plot and Equation



Trip Generation Manual, 10th Edition • Institute of Transportation Engineers