

LEISURE LANE SUBDIVISION LEFT-TURN ANALYSIS



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JUNE 2021

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INTRODUCTION

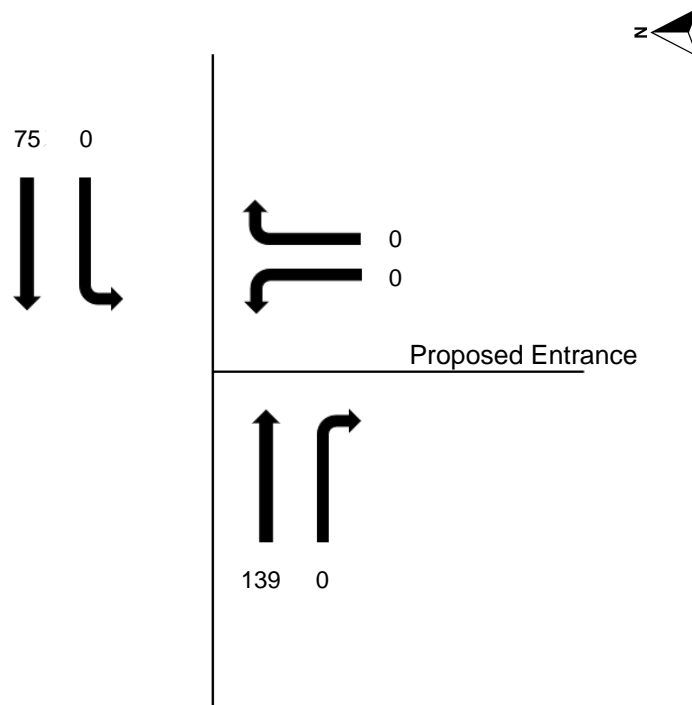
The preliminary development plan for the proposed subdivision, Leisure Lane, is located at 6406 Leisure Lane in Louisville, Kentucky. The proposed plan shows 49 buildable lots with 2 non-buildable lots. **Exhibit 1** shows the site location of the proposed project. The primary access to the development will be from Cooper Chapel Road while there will be a secondary access to the proposed neighborhood through the existing Lancewood Road. The purpose of this study is to compare the traffic generated by this proposed subdivision to the Kentucky Transportation Cabinet's Auxiliary Turn Lane Guidance and to confirm whether a left turn lane is warranted on Leisure Lane.



EXISTING CONDITIONS

Leisure Lane is maintained by the Louisville Metro. Using the Kentucky Transportation Cabinet's Interactive Traffic Count map, the estimated 2019 annual average daily traffic count (AADT) is 7,958 vehicles per day between the intersection of Cooper Chapel Road and Leisure Lane. The estimated K-Factor for this intersection is 0.12, which represents the proportion of annual average daily traffic occurring within an hour. Leisure Lane is a two-lane road with ten-foot-wide lanes and a two-foot paved roll curb. There are four-foot sidewalks present.

Analysis of both the A.M. and P.M. hour movement counts for the proposed intersection were done for Leisure Lane with respect to the proposed entrance. This information was collected on Tuesday, May 4th, 2021. The A.M. times were collected between 7 A.M. and 9 A.M. whereas the P.M. times were collected between 4 P.M. and 6 P.M. The P.M. peak hour occurred between 5:00 P.M. and 6:00 P.M. **Figure 2** below will show the 2021 peak hour traffic volume counts.



2022 - FUTURE CONDITIONS

The projected completion year of this project is 2022 therefore the analysis for this project will be done for the year 2022. The volumes along Leisure Lane are projected to increase by 1.5% percent per year based upon historical growth. The P.M. peak hour flow is as followed:

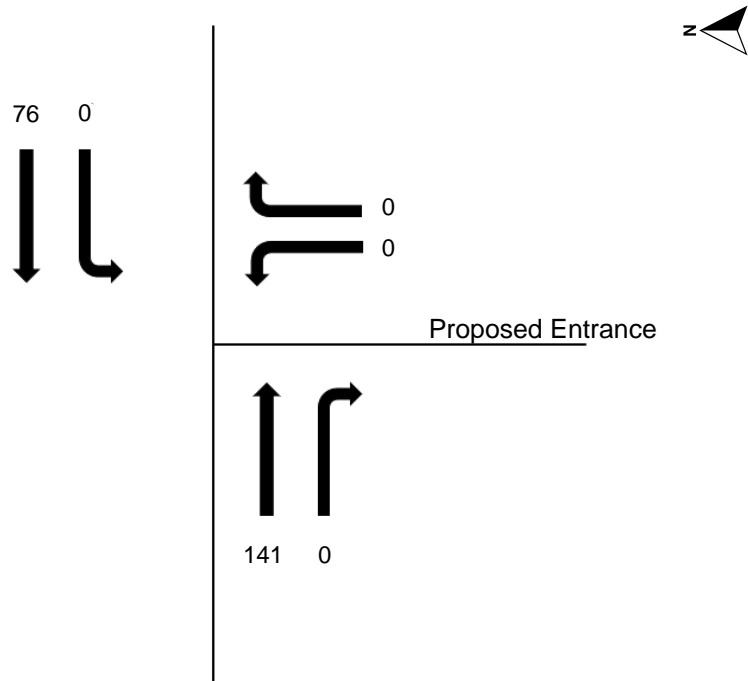


Figure 3. 2022 No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers **Trip Generation** Manual, 10th Edition contains trip generations rate for a wide range of land uses. This specific development will call for ITE Item Code 210 which explicitly is reserved for Single-Family Detached houses. We have reviewed and determined this to be the best fit for the Leisure Lane Subdivision development. The trip generation results are listed in **Table 1**. The trip generations were assigned with 80 percent to the West and 20 percent to the East based on historical analysis. **Figure 4** will show the trips generated by this development through the peak hour. **Figure 5** will display the individual turning movements that are expected for the year 2022 for the peak hour when the development is complete.

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trips	In	Out	Trips	In	Out
Single Family Detached (49 Lots)	40	10	30	51	32	19

Table 1. Peak Hour Trips Generated by Site

Trip Generation Equations that have been used are as followed:

AM Peak Hour – $T = 0.71(X) + 4.80$; Under the assumption of 25% Entering, 75% Exiting

PM Peak Hour – $\ln(T) = 0.96 \ln(X) + 0.20$; Under the assumption of 63% Entering, 37% Exiting

PEAK HOUR TRIPS GENERATED BY SITE

The P.M Peak Hour Trip Generation count is:

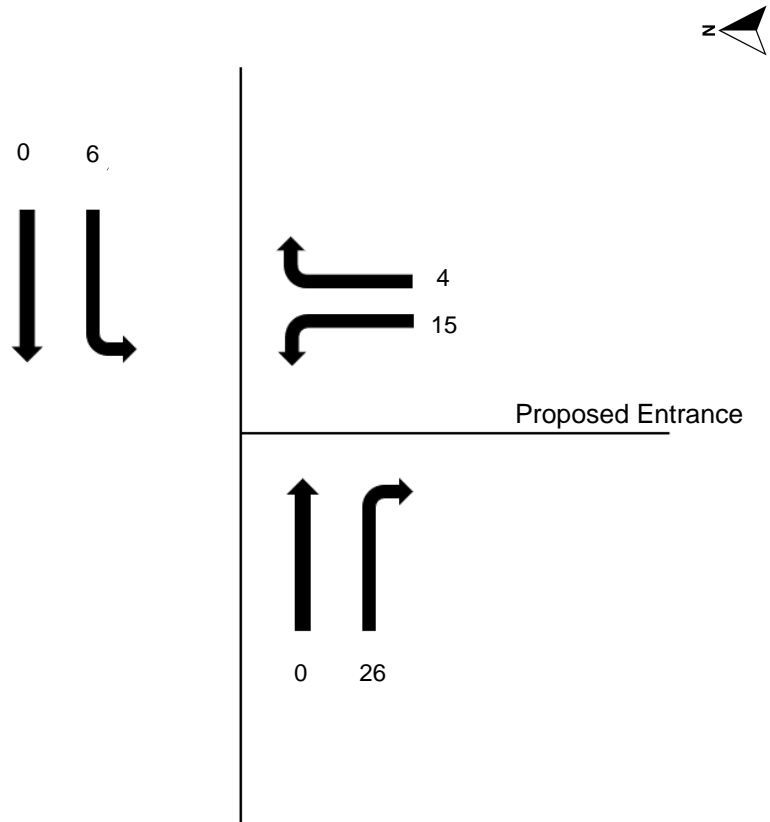


Figure 4. Peak Hour Trips Generated by Site

2022 BUILD PEAK HOUR VOLUMES

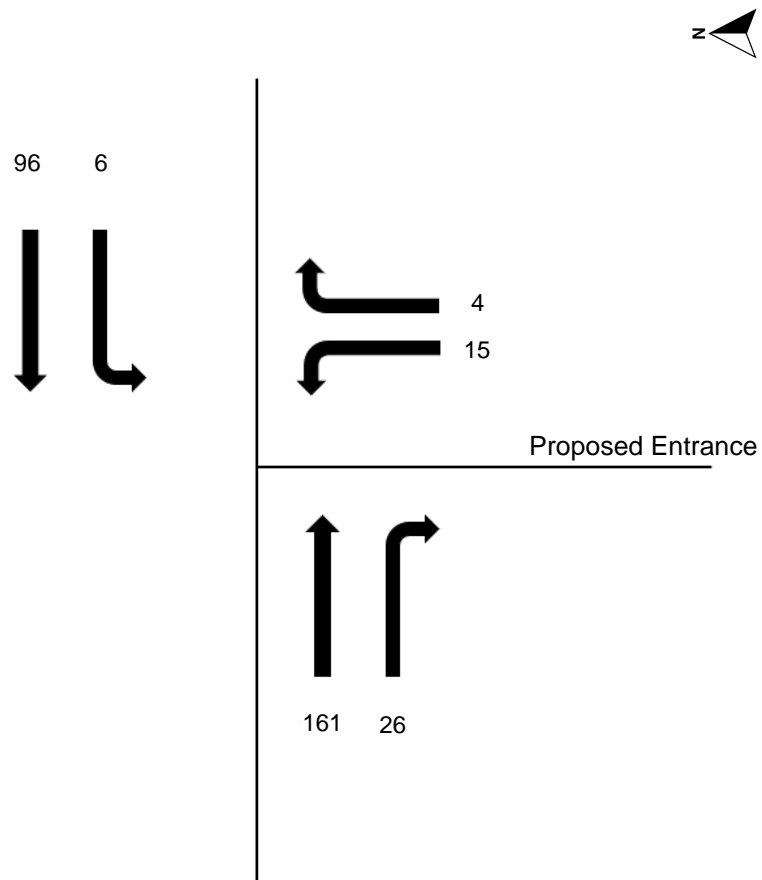


Figure 5. 2022 Build Peak Hour Volumes

ANALYSIS

The proposed entrance was evaluated for a left-turn lane utilizing the Kentucky Transportation Cabinet’s Highway Design Manual. Analyzing the volumes from the figure before, no turn lane will be required at the proposed entrance.

Left Turn Lane Warrants

<u>Input Fields</u>			
Left Turn Volume (vph)	6	Speed Limit (mph)	25
Advancing Volume (vph)	96	No. of through lanes	1
Opposing Volume (vph)	161	Percent Heavy Vehicles (decimal percent)	0.01



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

CONCLUSIONS

The left turn volume does not merit the volume warrant criteria established by the Kentucky Transportation Cabinet for the addition of an additional lane on Leisure Lane. Based on this analysis it is recommended that a left-turn lane will not be warranted for the proposed Leisure Lane Subdivision.