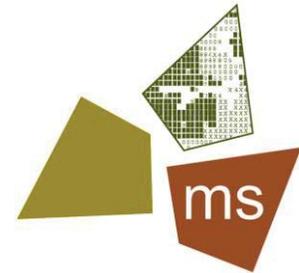


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April 1, 2019

Mr. Michael Love, PE, PTOE
Delaware County Engineer's Office
50 Channing Street
Delaware, OH 43015

APPROVED

By mlove at 2:53 pm, Apr 01, 2019

**RE: Hawk's Nest Subdivision
South Old 3C Highway & Olivero Drive
Turn Lane Warrant & Sizing**

Dear Mr. Love:

ms consultants has performed a traffic analysis to determine the turn lane requirements for the proposed Hawk's Nest Subdivision on South Old 3C Highway in Genoa Township, Ohio. There will be 29 single-family homes developed in the subdivision, in addition to the two existing homes on the property and two additional homes to be built not part of the subdivision. All 33 of these homes will access South Old 3C Highway at a new access point proposed opposite of Olivero Drive, which is the Vinmar North Development, a single-family home subdivision.

A turn lane warrant analysis was performed as per ODOT *State Highway Access Management Manual* and Delaware County Engineer's Office *Traffic Impact Study Standards*. Background traffic volumes were used from the *Traffic Impact Study for the Diersing Yarnell and Vinmar North Sites* prepared by Stantec in October 2012. The Design Year for the Vinmar North study was 2033. The traffic volumes for the proposed development were generated using the *ITE Trip Generation Manual, 10th Edition*. A summary of the trips can be found below.

ITE Code	Units	AM		PM	
		In	Out	In	Out
210	33 Single-Family Homes	7	21	22	13

Trip distribution was based on the Vinmar North Study. In that study, it was assumed that 80 percent of the site traffic was to/from the south and 20 percent was to/from the north. Thus, the same trip distribution was applied for this analysis. A summary of the inbound trips at the proposed Hawk's Nest Subdivision, access point can be found on the next page.

	Total Inbound Trips	NBRT	SBLT
AM Peak Hour	7	6	1
PM Peak Hour	22	18	4

As per the *Traffic Impact Study Standards*, there are three ways to warrant a left turn lane:

- A. Per Graph 1, 2, or 3, which are the left turn warrant charts contained in the ODOT *State Highway Access Management Manual*; or
- B. On major and minor arterial roadways with speed limits greater than 40 mph; or
- C. On major collector roadways with speed limits greater than 40 mph and more than 10 left turning vehicles during the peak hour for full build out of the development.

This portion of South Old 3C Highway is a major collector, as per the Delaware County Thoroughfare Plan. The speed limit is 45 miles per hour.

Graph 2, *2-Lane Highway Left Turn Warrant*, was analyzed using the peak hour volumes. A left turn lane was not warranted. This location does not meet criteria B as South Old 3C Highway is not an arterial. Criteria C is also not met as there would not be 10 or more vehicles making a left at the site driveway. The highest peak hour volumes is expected to be 4. Therefore, a left turn lane is not warranted at this location.

As per the *Traffic Impact Study Standards*, right turn lanes are warranted based on Graphs 4, 5, 6, or 7 in the ODOT *State Highway Access Management Manual*. However, there are two exceptions:

- Right turn lanes are not required for right turn volumes less than 10 vehicles during the peak hour for full-build out of the development
- Right turn lanes are not required for less than 200 vehicles in the peak hour in the approach lane or curb lane for roadways with greater than 1 approach lane for full build out of the development.

Based on the *2-Lane Highway Right Turn Warrant* a right turn lane is not warranted at this location.

Delaware County Engineer's Office has stated that a southbound left turn lane will be required to oppose the existing northbound left turn lane. Therefore, turn lane sizing calculations have been completed to determine the left of the southbound left turn lane. Using a design speed of 45-mph, a 175' southbound left turn lane will need to be constructed. This matches the length of the northbound left turn lane.

Based on the above findings, a 175' southbound left turn will be constructed at the proposed Hawk's Nest subdivision access point. No other roadway improvements will be required. The developer proposes a fee in lieu of construction of the turn lane with the amount to be determined and coordinated with the Delaware County Engineer's Office at a later date.