

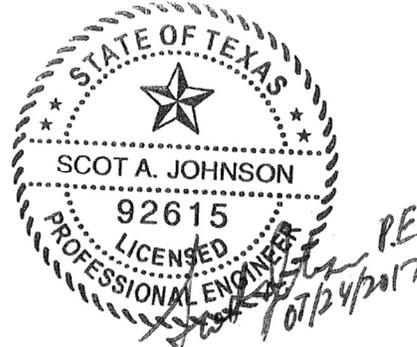
## MEMORANDUM

To: Jennifer Rabon  
Wilbow Corporation

From: Scot A. Johnson, P.E., PTOE  
Jake M. Halter  
Kimley-Horn and Associates, Inc.

Date: July 24, 2017

Subject: Knolls at Solana - Westlake, Texas  
Left-Turn Warrant Analysis



### **Introduction**

The Knolls at Solana residential tract is a 65-lot subdivision located to the south of Solana Boulevard midblock between Sam School Road and Davis Boulevard in Westlake, Texas.

The site will have two driveways, each forming intersections at existing median openings on Solana Boulevard. The East Drive will connect opposite the existing Trophy Woods Road serving the commercial property to the north of Solana Boulevard. The West Drive will connect opposite the existing Campus Circle, a street serving the same commercial property.

This memo details the traffic generated from the Knolls at Solana and examines the need for a left-turn lane from Solana Boulevard to each of the proposed driveways.

### **Projected Traffic Volumes**

The only available existing volumes for Solana Boulevard were collected in 2014 east of Sam School Road. The daily volume on Solana Boulevard just west of SH 114 was 9,411 vehicles per day. Because of the Sam School Road intersection between the counts and the residential site, the traffic volume on Solana Boulevard adjacent to the site is likely lower. The current daily volume is low for a six-lane arterial, but is expected to rise over time with further development in the region.

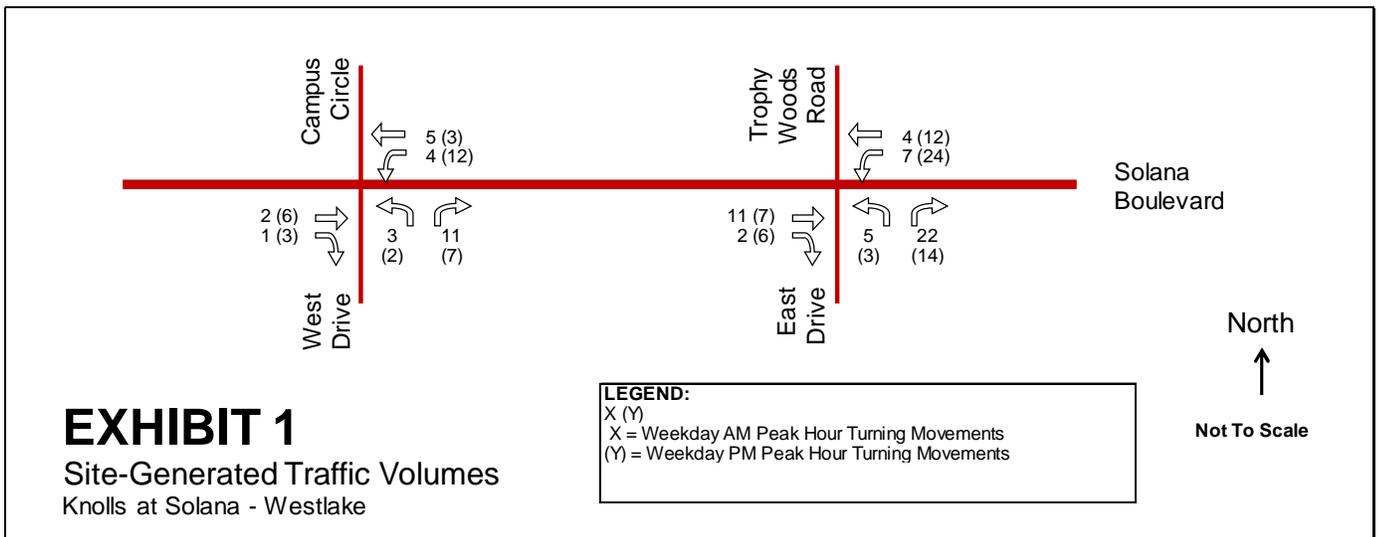
Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the 9th edition of Trip Generation Manual published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or trip ends, where one vehicle entering and exiting the site is counted as one inbound trip and one outbound trip.

The generated traffic from the proposed 65 lot subdivision is shown below in **Table 1**. The projected traffic is further divided between the two driveways, with the more major east driveway serving 43 lots or 66% of the total. The distribution of the site-generated traffic volumes into and out of the site driveways and onto the street system was based on the area street system characteristics, existing traffic patterns, and the locations of the proposed driveway access to/from the site. In general, 80% of

the site traffic was assumed to travel to and from the east (i.e., SH 114). The resulting site generated traffic can be seen in **Exhibit 1**.

**Table 1 – Site Generated Traffic**

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Single Family Detached Housing - Total	65	DU	210	707	14	41	55	45	26	71
Single Family Detached Housing - East (66% of total)	43	DU	210	468	9	27	36	30	17	47
Single Family Detached Housing - West (34% of total)	22	DU	210	239	5	14	19	15	9	24



**East Drive Left-Turn Lane**

The East Drive of the site is the major entrance point to the development. It serves the majority of the lots in the development and is the closer of the two driveways to SH 114. It also is proposed be opposite the major exit point of the office area across Solana Boulevard. The existing median width is the narrowest in the area, allowing for the storage of only 1 vehicle. Furthermore, the intersection is atypical, with two southbound left-turning lanes within the median, indicating a large demand for southbound left-turning movements when the office uses are departing.

While the number of westbound left turns into the Knolls development is not large, there is a potential for conflicts between the residential and adjacent office traffic flows. The peak outbound office traffic flow will be occurring at the same time as the peak inbound residential traffic flow. With only one storage position within the median for each southbound left-turn lane, in the afternoon there will potentially be no available spot for the arriving residential vehicle to turn off of westbound Solana Boulevard. Due to this conflict, it is recommended to construct a minimum-length westbound left-turn lane at the East Drive. The lane will provide a useful buffer space to remove westbound left-turning

vehicles from Solana Boulevard, reducing the pressure for multiple vehicles to pack into the narrow median.

### ***West Drive Left-Turn Lane***

The West Drive of the site is the minor entrance point to the development, serving fewer lots and being further from SH 114 than its eastern counterpart. There are fewer conflicts at this intersection due to its wider median (approximately 60 feet or 2-3 vehicles), fewer through traffic lanes on Solana Boulevard, and the intersection arrangement is much simpler. The conflicting volume from the Campus Circle connection to the north is believed to be significantly less than that of the office connection at East Drive.

With lower traffic demands and a larger maneuvering area within the median compared to East Drive, a westbound left-turn lane should not be required at West Drive.

### ***Summary***

The vehicle traffic generated by the Knolls at Solana Traffic residential neighborhood can comfortably be accommodated via its two driveways to Solana Boulevard. Due to the higher site volumes, the complexity of the intersection, and the higher amount of competing traffic, a left-turn lane is recommended to be constructed at East Drive. A left-turn lane should not be required for the West Drive.

***END***