



WELLS + ASSOCIATES

MEMORANDUM

TO: George R. Phillips, AICP
Loudoun County Office of Transportation Services

FROM: Kevin D. Sitzman, P.E.

DATE: November 16, 2009

RE: Loudoun Youth Soccer Association, Inc.
Sycolin Road Soccer Fields
Traffic Statement

RECEIVED
LAND DEVELOPMENT COUNTER

NOV 20 2009

LOUDOUN COUNTY
BUILDING & DEVELOPMENT

Introduction

This memorandum presents a traffic statement for the proposed lighted soccer fields to be located along the east side of Sycolin Road, south of the Park'n'Ride lot and north of Cochran Mill Road. While soccer fields are a permitted use on the subject site, the lights (proposed to permit the extension of practice and game times into the evening hours) would require special exception approval. Access would be provided at an existing driveway location along Sycolin Road.

Existing Conditions

In the vicinity of the subject site, Sycolin Road is a two-lane rural highway with a posted speed limit of 35 mph. Parcels fronting Sycolin Road are served by individual driveways, thus resulting in left turn conflicts that are common on two-lane facilities.

According to the most recent information published by the Virginia Department of Transportation (VDOT), the Annual Average Daily Traffic (AADT) volume for the segment of Sycolin Road between the Town of Leesburg limits and Shreve Mill Road was 3,200 vehicles per day. The data further indicate that approximately 12.6 percent of these vehicles (or 403 vehicles) utilize the road during the peak hour. The Highway Capacity Manual identifies the capacity of a two-lane highway as 3,200 passenger cars per hour. Thus, the current traffic volume is well within the capacity of the roadway.

Site Trip Generation

The number of vehicle-trips that would be expected with the soccer fields was determined based on the standard trip generation rates published by the Institute of Transportation Engineers (ITE) in Trip Generation, 8th Edition. Table I indicates the numbers of trips generated during the AM and PM peak hours, both for the typical commuter peaks and the peak hours of the use. The trip generation

estimates were based on three athletic fields, as the concept plan indicates two full fields and two “play areas.” The play areas will likely be used for practices, but without lights would not be used to the same extent as the fields, and thus were each included as “1/2 of a field.”

Table I
Trip Generation Analysis

Land Use/ Time Period	ITE Code	Amount	Units	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
<u>Soccer Complex</u>	488	3	fields						
Adjacent Street Peak Hour				2	2	4	43	19	62
Peak Hour of Generator				5	4	9	21	44	65

Note: Based on Trip Generation, 8th Edition, Institute of Transportation Engineers.

It is noted that the critical PM peak hour of generator volume is only five percent (or three trips) more than during the commuter peak hour. Thus, even if the addition of lights to the proposed fields moved the overall afternoon/evening peak hour to be coincident with the commuter peak hour, an increase of no more than three total trips (or five percent) during the street peak hour would result from the special exception.

Hazardous Locations

Based on a field reconnaissance, no hazardous locations or constraints were identified. Due to the presence of multiple driveways along this segment of Sycolin Road, drivers would generally expect vehicles turning from the through lanes of the mainline. Thus, access to the subject site via an unsignalized driveway on the relatively straight, flat segment of Sycolin Road would not present a hazard.

Turn Lanes

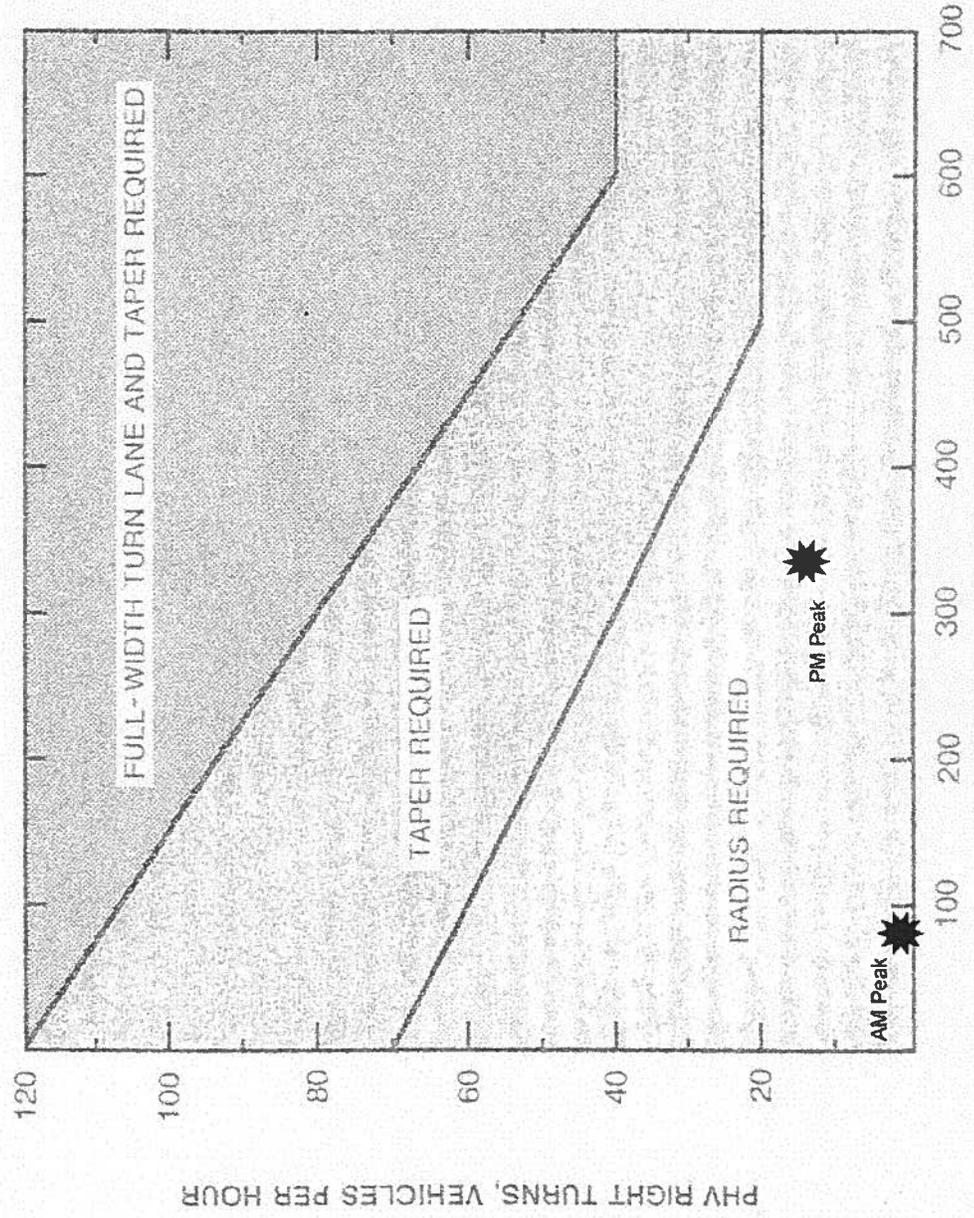
Loudoun County staff requested an analysis of the need for left and right turn lanes to serve the proposed soccer fields. Traffic volumes for Sycolin Road were based on published VDOT counts and K-factors, the trip generation estimates shown in Table I, and an anticipated directional distribution of 70 percent from the north/30 percent from the south. The warrants for right turn lanes from Figure C-1-8 of the VDOT Road Design Manual and Exhibit 9-75 of the AASHTO Green Book. The results are attached to this traffic statement and indicate that neither a right nor a left turn lane would be required at the proposed entrance to the soccer fields.

Conclusion

The special exception to add lights to the permitted soccer fields along Sycolin Road would not significantly increase the number of trips generated by the site during critical peak hours. The application would have a minimal impact on the traffic safety and operations along Sycolin Road and would not result in the need for turn lanes.

Please feel free to contact me with any questions you may have regarding this matter.

Guidelines for Right Turn Treatments - Two Lane Highway Sycolin Road/Site Entrance



LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph (72 km/hr.), PHV right turns > 40, and PHV total < 300

Adjusted PHV Right Turns = PHV Right Turns - 20

If PHV is not known use formula: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

Table 1
 Sycolin Soccer Fields
 Loudoun, VA
 Left Turn Lane Warrant Analysis - 2 Lane Roadway

AM Peak Hour

<u>Left Turn Lane Warrant</u>		<u>AM Peak Hour</u>
<u>Sycolin Road/ Site Entrance</u>		<u>Site Buildout</u>
1. Enter operating speed of 40, 50, or 60 mph >		<u>40</u> mph
2. Enter advancing volumes		
Percent left turns=	0%	
	Lefts	> <u>1</u> vph
	Throughs	> <u>310</u> vph
	Rights	> <u>0</u> vph
	Total	> <u>311</u> vph
3. Enter opposing volume		> <u>94</u> vph
The maximum allowable advancing volume =		> <u>480</u> vph
A left turn lane is	<u>not warranted.</u>	

Exhibit 9-75
 A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2001. (AASHTO)

Opposing Volume	Advancing Volume/Hour			
	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns
<u>40-mph Operating Speed (60 km/h)</u>				
800	330	240	180	160
600	410	305	225	200
400	510	380	275	245
200	640	470	350	305
100	720	515	390	340
<u>50-mph Operating Speed (80 km/h)</u>				
800	280	210	165	135
600	350	260	195	170
400	430	320	240	210
200	550	400	300	270
100	615	445	335	295
<u>60-mph Operating Speed (100 km/h)</u>				
800	230	170	125	115
600	290	210	160	140
400	365	270	200	175
200	450	330	250	215
100	505	370	275	240

Table J-2
 Sycolin Soccer Fields
 Loudoun, VA
 Left Turn Lane Warrant Analysis - 2 Lane Roadway

PM Peak Hour

<u>Left Turn Lane Warrant</u>		<u>PM Peak Hour</u>
<u>Sycolin Road/ Site Entrance</u>		<u>Site Buildout</u>
1. Enter operating speed of 40, 50, or 60 mph >		40 mph
2. Enter advancing volumes		
Percent left turns= 24%	Lefts >	30 vph
	Throughs >	93 vph
	Rights >	0 vph
	Total >	123 vph
3. Enter opposing volume		> 323 vph
The maximum allowable advancing volume =		> 288 vph
A left turn lane is <u>not warranted.</u>		

Exhibit 9-75
 A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2001. (AASHTO)

Opposing Volume	Advancing Volume/Hour			
	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns
<u>40-mph Operating Speed (60 km/h)</u>				
800	330	240	180	160
600	410	305	225	200
400	510	380	275	245
200	640	470	350	305
100	720	515	390	340
<u>50-mph Operating Speed (80 km/h)</u>				
800	280	210	165	135
600	350	260	195	170
400	430	320	240	210
200	550	400	300	270
100	615	445	335	295
<u>60-mph Operating Speed (100 km/h)</u>				
800	230	170	125	115
600	290	210	160	140
400	365	270	200	175
200	450	330	250	215
100	505	370	275	240