

***SHADY GLEN***  
***Knox County, Tennessee***

***TRAFFIC IMPACT STUDY***

***Prepared For:***

**VOLUNTEER DEVELOPMENT**

***Prepared By:***



**November 2014**

**SHADY GLEN**  
**KNOX COUNTY, TENNESSEE**  
**TRAFFIC IMPACT STUDY**

Prepared for  
Volunteer Development  
405 Montbrook  
Knoxville, TN 37919



November 2014  
Revised December 2014

Prepared by

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Project No. 106803

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# INTRODUCTION

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CDM Smith is pleased to submit this report to address the impact and access of a proposed residential subdivision development in southwest Knox County, Tennessee. The basis for this study required the collection of traffic data, generation of anticipated traffic volumes from the proposed site, and normal traffic growth. Analyses of the resulting traffic projections were conducted to determine the capacity and levels of service for the site access and adjacent intersection with and without the proposed development. This study will develop measures necessary to mitigate traffic impacts including improved roadway geometrics and traffic control devices within the environs of the proposed development.

## **Project Description**

The proposed project is a single family residential subdivision. The proposed development is on a 45.58 acre site. **Figure 1** illustrates the site plan. Access to and from the site is with a proposed street intersection with Northshore Drive.

## **Site Location**

The site is in the southwest of the Northshore Drive and Choto Road intersection, southwest area of Knox County. The site is south of the Town of Farragut and southwest of the Knoxville central business district (CBD). The adjacent land use is residential in character. **Figure 2** illustrates this location relative to local and regional access.

# SITE PLAN

Shady Glen  
Knox County, TN



Figure 1

# VICINITY MAP

## Shady Glen

### Knox County, TN

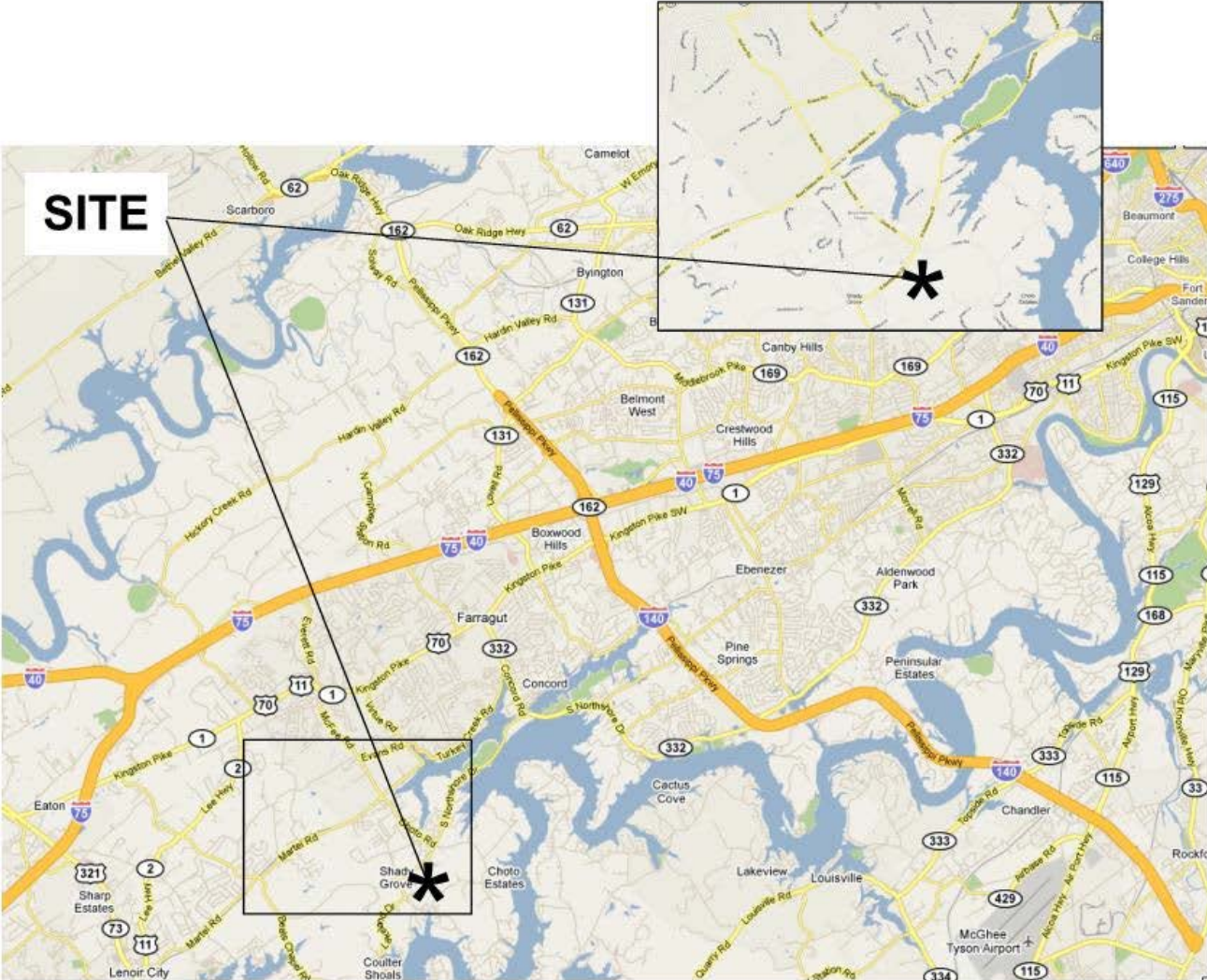


Figure 2

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## **LOCAL AND REGIONAL ACCESS**

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### **Local Access**

Local access for this site is from Northshore Drive, a 2-lane classified minor arterial, and Choto Road, a 2-lane classified collector. Northshore Drive is an east and west facility with an approximate width of 24-feet and no shoulders. Choto Road is a north and south facility with an approximate width of 20-feet and no shoulders. The average daily traffic (ADT) on Northshore Drive is approximately 4,180 west of the site near the Loudon County line and 10,230 to the east. Choto Road has an approximate ADT of 3,010 north of the site.

The intersection of Northshore Drive and Choto Road was recently improved with a round about.

### **Regional Access**

Northshore Drive is also a regional facility extending from Loudon County to the west into Knoxville intersecting Kingston Pike and Papermill Road and where it terminates opposite the eastbound I-40/75 off ramp. East of the site, Northshore Drive intersects numerous facilities that extend north to Kingston Pike and intersects Pellissippi Parkway (I-140). Pellissippi Parkway extends north to Oak Ridge and south to Alcoa and Alcoa Highway (U.S. 129). North of Northshore Drive, Pellissippi Parkway intersects Kingston Pike and I-40/75.

To the north Choto Road becomes Harvey Road which intersects Boyd Station Road where McFee Road and Virtue Road can be used to access Kingston Pike in Farragut. Interstate 40/75 can be accessed in Farragut from either Campbell Station Road or Watt Road.

Northwest of the site, I-40/75 splits with I-40 continuing to Nashville and I-75 continues south to Chattanooga. Interstate 40/75 extends east to the Knoxville CBD and to I-81 and North Carolina. Interstate 81 extends north through the Tri-Cities area and into Virginia. Interstate 40/75, west of Pellissippi Parkway, has a 2013 ADT of 128,260. The approximate 2013 ADT for I-40/75 east of Pellissippi Parkway is 166,650.



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# EXISTING TRAFFIC CONDITIONS

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## Existing Traffic Control

Traffic control for the Choto Road and Northshore Drive was recently improved from STOP control for the Choto Road approaches and a warning beacon to a roundabout. Posted speed limits for Northshore Drive and Choto Road are 40mph and 30mph, respectively.

## Existing Traffic Volumes

This traffic impact study addresses the intersection of Northshore Drive at Choto Road and the proposed subdivision intersection with Northshore Drive. A traffic count for the intersection of Northshore Drive at Choto Road was conducted by CDM Smith middle of November of this year. **Figure 4** illustrates the 2009 peak-hour traffic volumes. Peak hours were found between 7:00-8:00AM and 4:45-5:45PM

## Existing Capacity and Level of Service

In order to evaluate the current operations of the traffic control devices, capacity and level of service were calculated using the **2010 Highway Capacity Manual, Special Report 209** published by the Transportation Research Board (TRB). Signalized and unsignalized intersections are evaluated based on estimated intersection delays, which may be related to level of service (LOS). Level of service and capacity are the measurements of an intersection's ability to accommodate traffic volumes. Levels of service for intersections range from A to F. Level of service A is the best, and LOS F is failing.

Unsignalized intersections levels of service have lower thresholds of delays than do signals. A LOS of F exceeds estimated delays of 50 seconds. For urban arterials, minor approaches may frequently experience levels of service E. A full level of service description for unsignalized intersections is presented in Table 1.

**2014 EXISTING  
TRAFFIC  
Shady Glen  
Knox County, TN**



**LEGEND**  
 XXX AM PEAK  
 (XXX) PM PEAK



**Figure 3**

**TABLE 1. LEVEL OF SERVICE (LOS) DESCRIPTION  
FOR UNSIGNALIZED INTERSECTIONS**

Level of Service	Average Control Delay per Vehicle (seconds)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

**SOURCE:** Highway Capacity Manual, TRB Special Report 209

Analyses were conducted using the Synchro Software, developed by Trafficware. Analyses found that the intersection of Northshore Drive and Choto Road operates a minimum LOS B which is experienced for the southbound approach during the AM peak hour. **Table 2** presents the current capacity and level of service.

**TABLE 2. 2014 TRAFFIC  
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	MOVEMENT LANE GROUP	PEAK HOUR	Approach Delay(s)	LOS
S Northshore Dr & Choto Rd	Roundabout	NB	LTR	AM	14.6	B
				PM	7.3	A
		SB	LTR	AM	5.5	A
				PM	9.8	A
		EB	LTR	AM	8.0	A
				PM	8.4	A
		WB	LTR	AM	14.2	B
				PM	6.0	A
		Overall		AM	10.8	B
				PM	8.7	A

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## **BACKGROUND TRAFFIC CONDITIONS**

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Background traffic is that which can be anticipated regardless of the proposed development. Traffic within the study area should continue to grow due to other developments as well as the continued growth within the surrounding area. This background traffic must be analyzed and evaluated for the purpose of establishing a baseline.

### **Background Traffic Volumes**

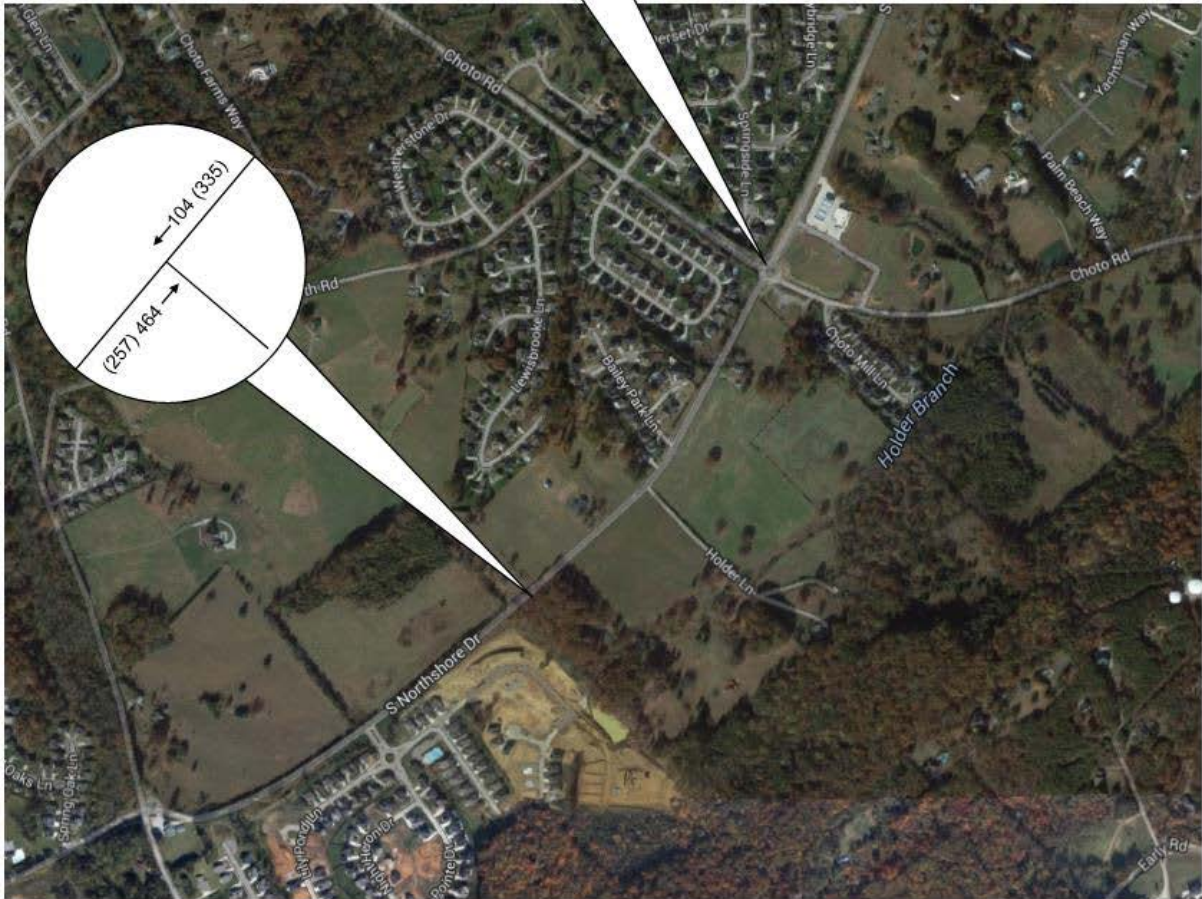
The background traffic reflects an average growth rate developed from the historical traffic count data in the project vicinity. Using the ADT count histories, calculations determined that traffic on Northshore Drive and Choto Road varied with growth rates between 1.75-percent and 8.25-percent over the past few years. Northshore Drive, east of the site, indicated a 5.0-percent annual growth rate. For the purpose of this study, a 5.0-percent compounded annual growth rate was assumed. Traffic was projected until 2020, a 6 year horizon. This subdivision may build out sooner, however, the 2020 provides more than sufficient time to fully develop. Actual build out will depend on the economic conditions for the next few years. Figure 4A illustrates the projected traffic possible using 1 factor of 1.34 reflecting the assumed rate of growth and a horizon year of 2020.

In addition to the growth rate assumed, traffic was assigned for the Montgomery Market, a mixed use commercial development located in the southeast corner of the Choto Road at Northshore Drive. **Figure 4B** illustrates these commercial trips without the Weigels store, found in the study prepared for it dated December 2009. Adding these commercial trips to the grown 2020 traffic results in the total background traffic illustrated in **Figure 4C**.

### **Background Capacity and Level of Service**

Analyses were performed with the grown traffic volumes, and the results are presented in **Table 3**. With the traffic increase for the study intersections, the analyses found that a minimum LOS C can be maintained.

**2020 BACKGROUND  
TRAFFIC GROWTH**  
Shady Glen  
Knox County, TN

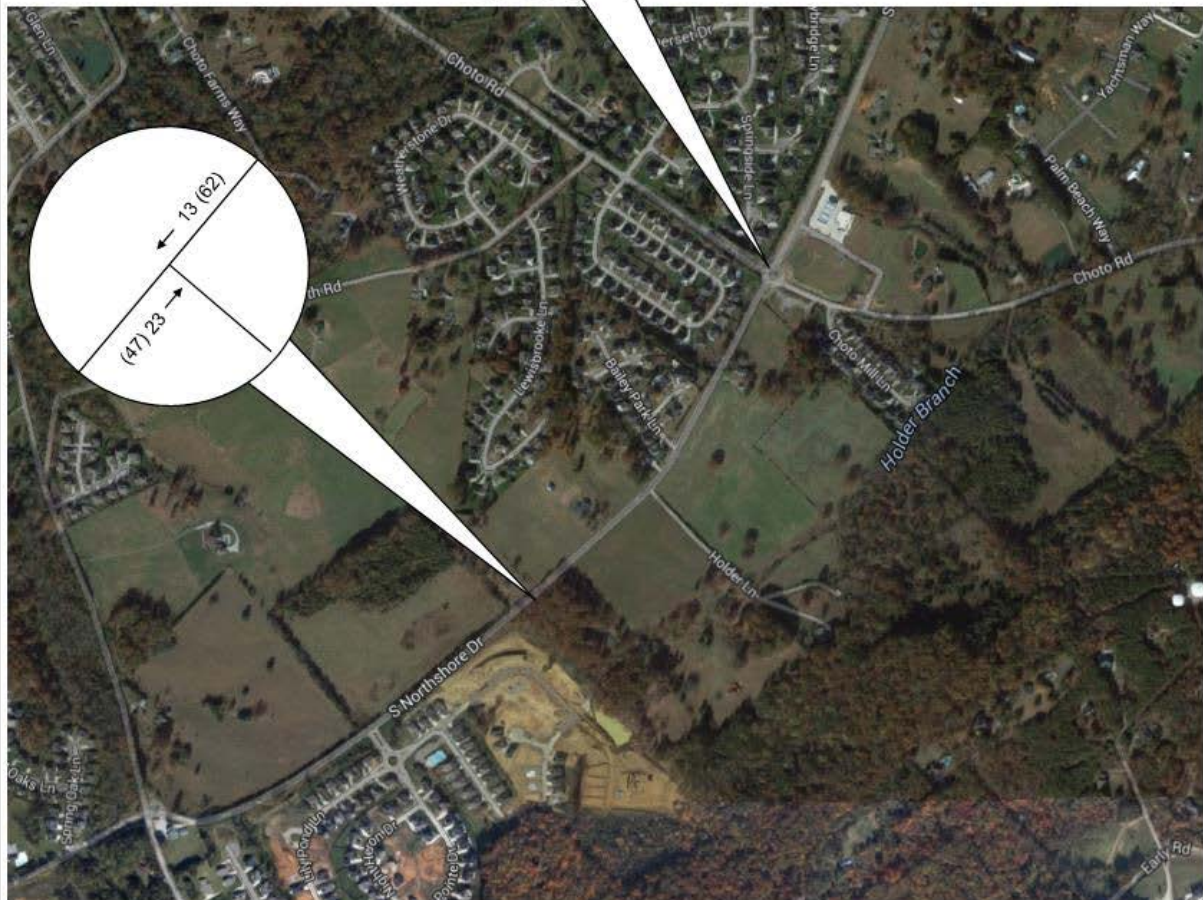


**LEGEND**  
XXX AM PEAK  
(XXX) PM PEAK



**Figure 4A**

**2020 BACKGROUND  
TRIPS**  
Shady Glen  
Knox County, TN

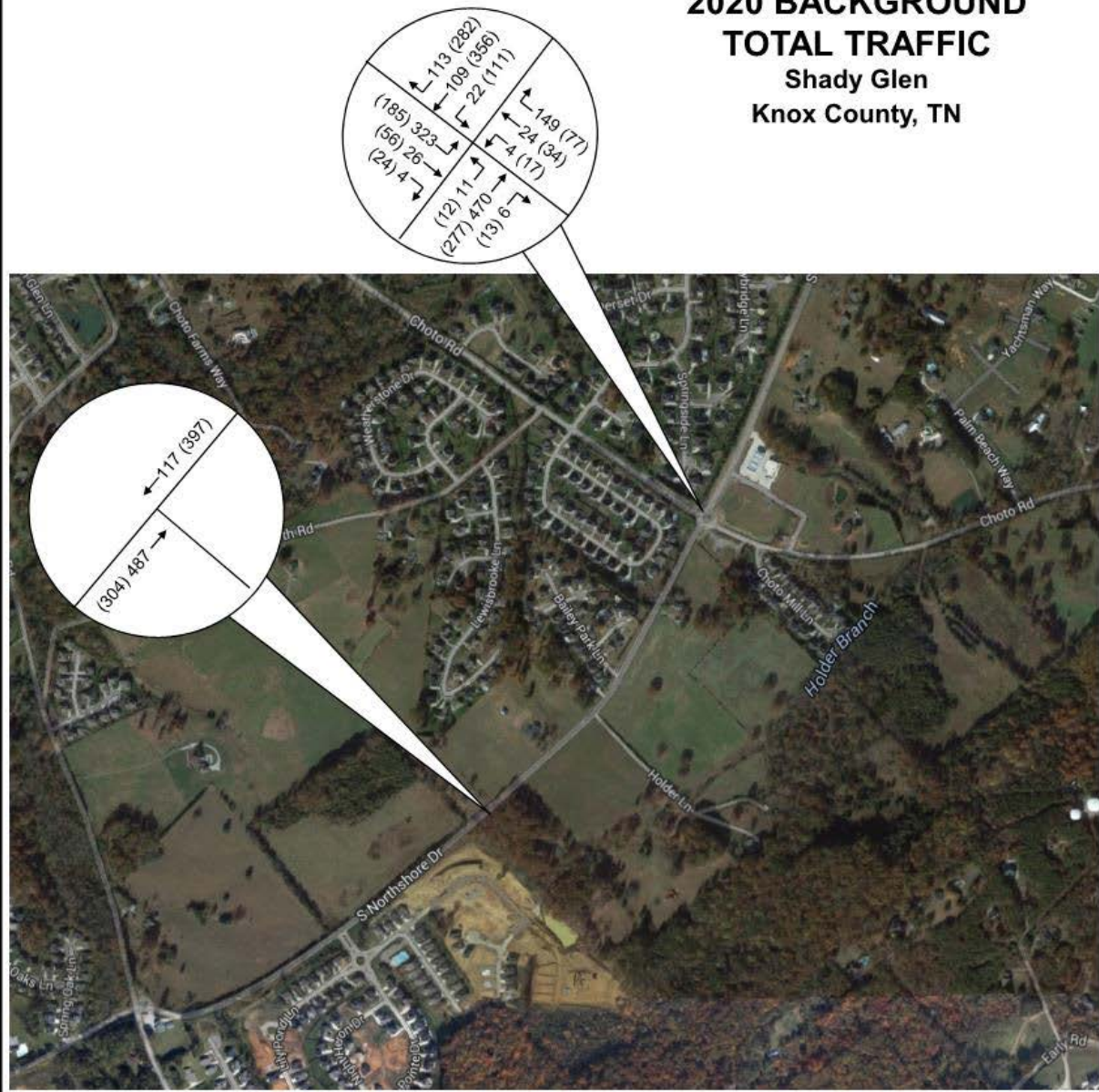


**LEGEND**  
XXX AM PEAK  
(XXX) PM PEAK



**Figure 4B**

**2020 BACKGROUND  
TOTAL TRAFFIC**  
Shady Glen  
Knox County, TN



**LEGEND**  
XXX AM PEAK  
(XXX) PM PEAK



**Figure 4C**

**TABLE 3. 2020 BACKGROUND TRAFFIC  
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	MOVEMENT LANE GROUP	PEAK HOUR	Approach Delay(s)	LOS	
S Northshore Dr & Choto Rd	Roundabout	NB	LTR	AM	20.1	C	
				PM	10.6	B	
		SB	LTR	AM	5.7	A	
				PM	19.0	C	
		EB	LTR	AM	8.3	A	
				PM	12.2	B	
		WB	LTR	AM	15.7	C	
				PM	8.0	A	
		Overall			AM	13.4	B
					PM	15.0	B



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# PROJECT IMPACTS

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Project conditions are developed by generating traffic based on the proposed land uses, distributing the trips to the transportation network, and again conducting analyses for capacity and level of service.

## Trip Generation

Project traffic was determined using the publication, **Trip Generation, 9th Edition**. This reference is published by the Institute of Transportation Engineers (ITE) and represents national data collected for many different land uses including industrial, residential and commercial uses. **Trip Generation** is an essential tool in calculating the traffic, which may be generated by a proposed development. The study generated traffic for the approximate 46 acres, 150sfu. residential development. **Table 4** presents the trip generation of this proposed site. From the table, the site may generate 1,525 daily trips.

**TABLE 4. TRIP GENERATION**

Land Use	Land-Use Code	Units	Daily Trips	AM Peak-Hour Trips		PM Peak-Hour Trips	
				Enter	Exit	Enter	Exit
Single-Family	210	150	1,525	29	86	95	56

Reference: Trip Generation, 9th Edition

## Trip Distribution and Assignment

For the proposed use, trips were distributed to the adjacent roads based on the local residential pattern observed from Choto Road to and from the east. Inbound trips varied slightly from the outbound trips. From the north and south on Northshore Drive, 87- and 5-percent of the trips were assigned, respectively. Choto Road was assigned 7-percent from the northwest- and 1-percent percent from the southeast, respectively. To the north, exiting trips were assigned 89-percent, and Choto Road was assigned 5-percent. Choto Road to the southeast was assigned 1-percent. **Figure 5** illustrates the distribution and assignment of the primary trips to the study intersections and site access.

## Project Traffic Volumes

By multiplying the trips generated by the distribution, the project traffic volumes were determined. **Figure 6** illustrates the resulting site related trips.

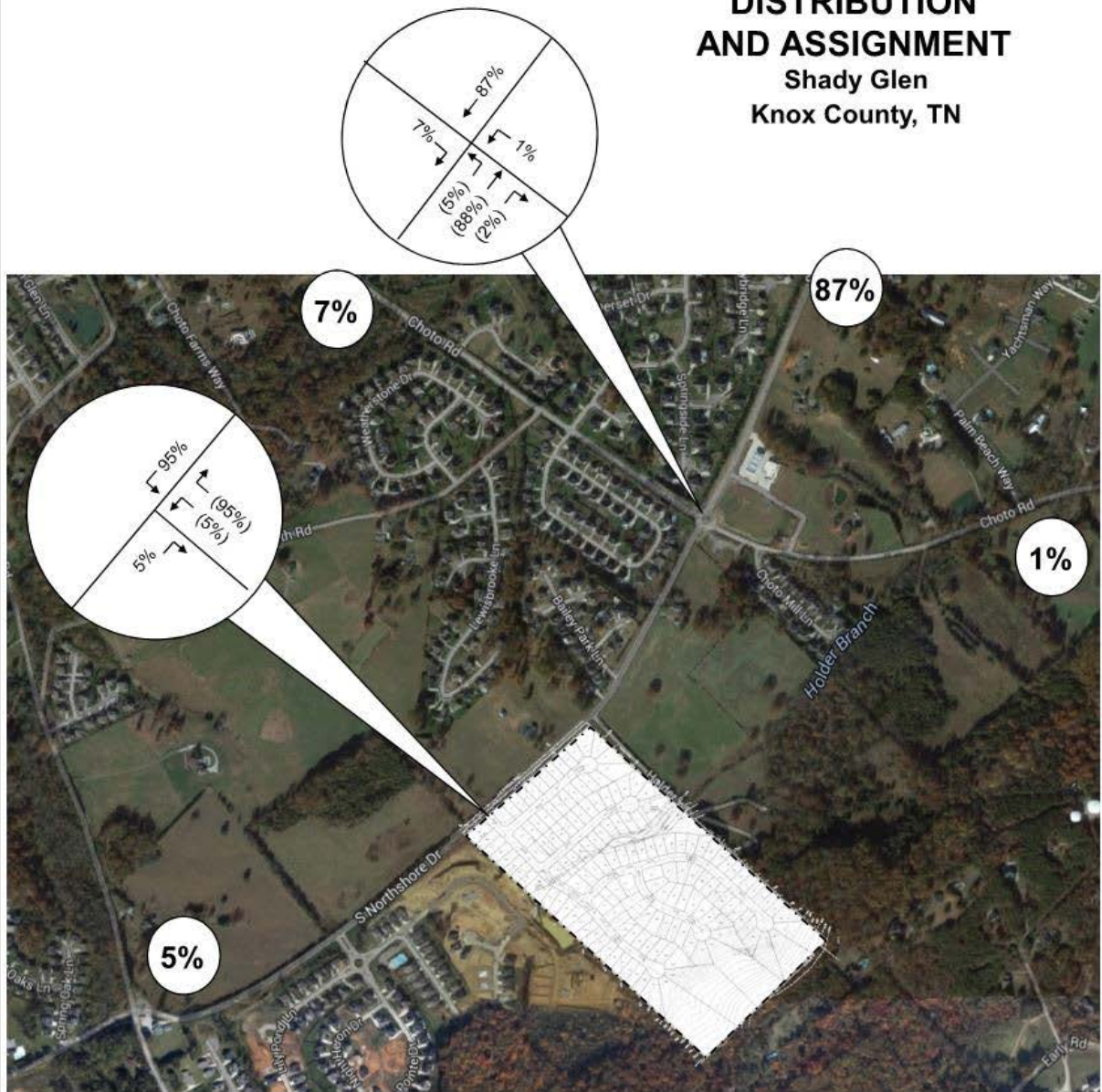
## Total Projected Traffic Volumes

The total background and project traffic volumes were added together to develop post-development traffic volumes for the year 2020. **Figure 7** illustrates the 2020 projections. Using these projections, capacity and LOS analyses could again be conducted and mitigation measures including traffic control devices and roadway and intersection geometry can be evaluated.

# DISTRIBUTION AND ASSIGNMENT

## Shady Glen

### Knox County, TN

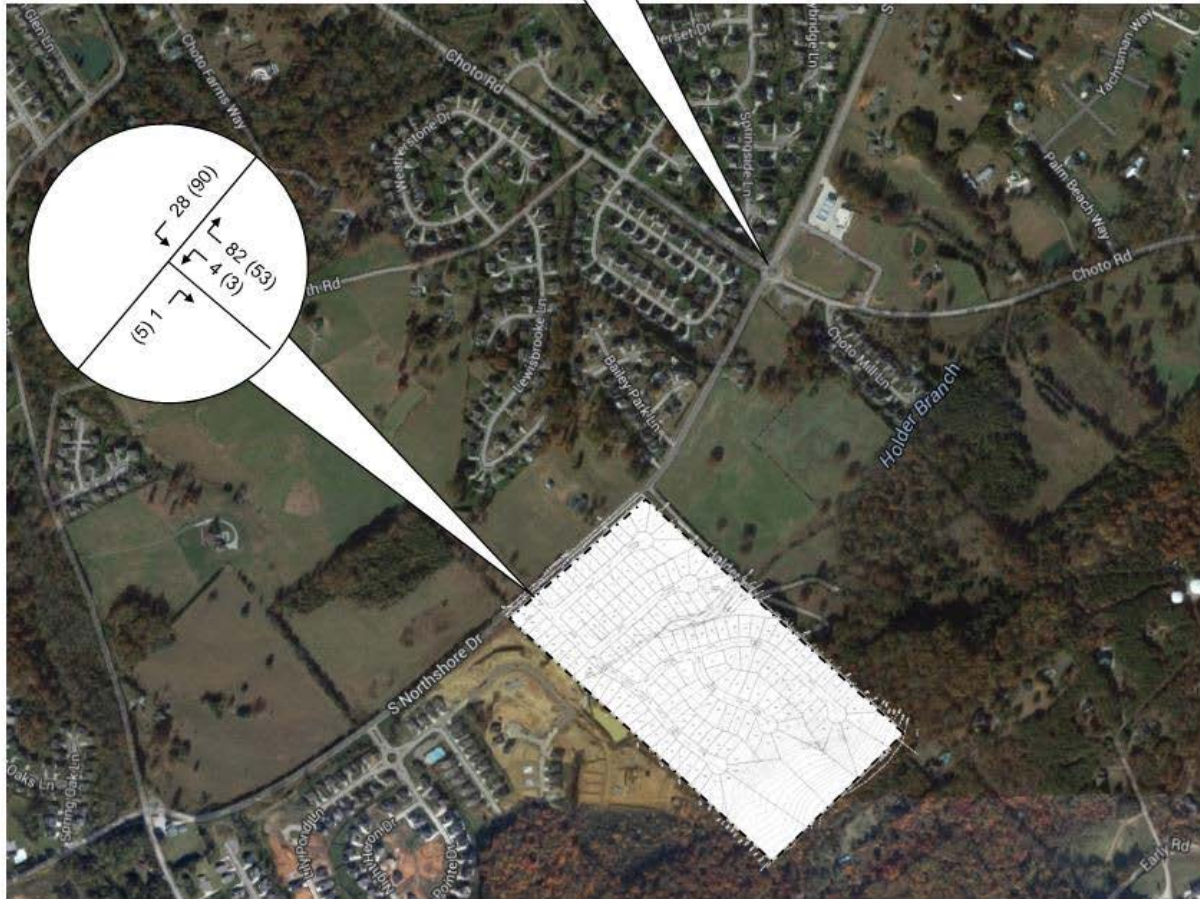


**LEGEND**  
 XX% ENTERING  
 (XX%) EXITING



**Figure 5**

**PROJECT  
TRIPS**  
Shady Glen  
Knox County, TN



**LEGEND**  
XXX AM PEAK  
(XXX) PM PEAK



**Figure 6**

**2020 PROJECTED  
TRAFFIC  
Shady Glen  
Knox County, TN**



**LEGEND**  
 XXX AM PEAK  
 (XXX) PM PEAK



**Figure 7**

**Projected Capacity and Level of Service**

Using the identified turning movements for the projected traffic conditions, unsignalized and roundabout capacity and level of service analyses were conducted. The analyses for the projected 2020 traffic conditions are shown in **Table 5**, and the delay and LOS for the study is summarized in **Table 6**. Levels of service for the intersection of Northshore Drive and Choto Road can be maintained from those determined for the background traffic condition with one exception; a LOS D may be experienced for the southbound approach during the PM peak hour. The proposed subdivision access street was found to operate at acceptable levels of service.

**TABLE 5. 2020 PROJECTED CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	MOVEMENT LANE GROUP	PEAK HOUR	Approach Delay(s)	LOS
S Northshore Dr & Choto Rd	Roundabout	NB	LTR	AM	29.3	D
				PM	12.3	B
		SB	LTR	AM	6.1	A
				PM	26.7	D
		EB	LTR	AM	8.7	A
				PM	14.6	B
		WB	LTR	AM	18.1	C
				PM	8.6	A
		Overall		AM	17.9	C
				PM	19.9	C
S Northshore Dr & Propose Access	STOP	WB	LR	AM	13.1	B
				PM	11.1	B

**TABLE 6. SUMMARY  
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	MOVEMENT LANE GROUP	PEAK HOUR	2014 TRAFFIC		2020 BACKGROUND		2020 BUILDOUT			
					Approach Delay(s)	LOS	Approach Delay(s)	LOS	Approach Delay(s)	LOS		
S Northshore Dr & Choto Rd	Roundabout	NB	LTR	AM	14.6	B	20.1	C	29.3	D		
				PM	7.3	A	10.6	B	12.3	B		
		SB	LTR	AM	5.5	A	5.7	A	6.1	A		
				PM	9.8	A	19.0	C	26.7	D		
		EB	LTR	AM	8.0	A	8.3	A	8.7	A		
				PM	8.4	A	12.2	B	14.6	B		
		WB	LTR	AM	14.2	B	15.7	C	18.1	C		
				PM	6.0	A	8.0	A	8.6	A		
		Overall		AM	10.8	B	13.4	B	17.9	C		
				PM	8.7	A	15.0	B	19.9	C		
		S Northshore Dr & Propose Access	STOP	WB	LR	AM					13.1	B
						PM					11.1	B

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### **Sight-Distance Evaluation**

Site access was evaluated for sight-distance. The proposed street intersection with Northshore Drive was determined to have an acceptable sight-distance. Northshore Drive speed limit is currently posted for 40mph adjacent to the site. The measured sight distance to the south is 400 feet, limited by a vertical curve and approximately 900 feet to the north. These distances are acceptable for the posted speed limit.

### **Traffic Control and Turn Lane Evaluation**

Traffic control for the proposed intersection with Northshore Drive was analyzed and examined with a STOP control for the proposed street. Left and right lane warrant analyses were conducted for the proposed site access intersection with Northshore Drive. For the evaluation of the left-turn, the PM peak was analyzed as it was the more critical period for both the advancing and opposing traffic volumes. The analysis utilized Harmelinks nomograms, the basis of the criteria adopted by the County but also provides the minimum left-turn storage requirement. The southbound approach of Northshore Drive to the site access constitutes approximately 20-percent left-turn traffic in the advancing flow of approximately 475 with an opposing traffic flow of nearly 300. A left-turn lane on Northshore Drive would be warranted. The projected left-turn percentage, advancing traffic flow and the opposing traffic warrants a minimum left-turn lane of 75 feet. The left-turn lane warrant evaluation found the length required between a 75-foot and 100-foot. Left-turn lane taper may vary in length with a minimum of 100 feet, often typical for urban conditions to a recommended length of 160 feet for a 40mph. Bay tapers may also be combined with the approach tapers depending on any restrictive conditions.

A right-turn lane from Northshore Drive is not warranted as the right-turn volume is minimal. The threshold for the right-turn lane volume required is 100 vehicles during the AM peak hour and 250 during the PM peak hour.

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## RECOMMENDATIONS

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The analyses conducted and the review of the traffic volumes identified the following recommendations:

1. Provide 100-foot left-turn lane from Northshore Drive to the site.
2. Provide separate left- and right-lanes from the proposed site access to Northshore Drive.
3. Minimize landscaping, using low growing vegetation and signing at the planned accesses to insure that safe sight distance is provided and can be maintained.

Roadway and intersection design should conform to the recommended standards and practices of the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and Knox County.



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## CONCLUSION

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The study of the proposed neighborhood commercial development generated and distributed trips for the proposed single-family residential development. Background traffic was developed for the year 2020 using a 5-percent annual compounded growth rate and trips generated by the Montgomery Markets mixed use commercial development located at the Northshore Drive and Choto Road intersection. Project traffic was determined using the publication, **Trip Generation, 9th Edition**, using Land Use Code 210. Using the identified turning movements for the projected traffic conditions, capacity and level of service analyses were conducted for the study intersection and the proposed site access. Study intersections and site accesses were found to operate at acceptable levels of service with improvements identified including a left-turn lane on Northshore Drive for the proposed site access. Sight-distance for the proposed intersection with Northshore Drive was found acceptable for the posted speed limit of 40mph. The sight restriction to the south is a vertical curve on Northshore Drive. With these recommendations, the efficient and safe flow of traffic may be managed and the necessary access for the site provided.

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## APPENDIX

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Trip Generation

Traffic Counts

Synchro Analyses

Auxiliary Lane Analyses



**CDM SMITH Inc.**  
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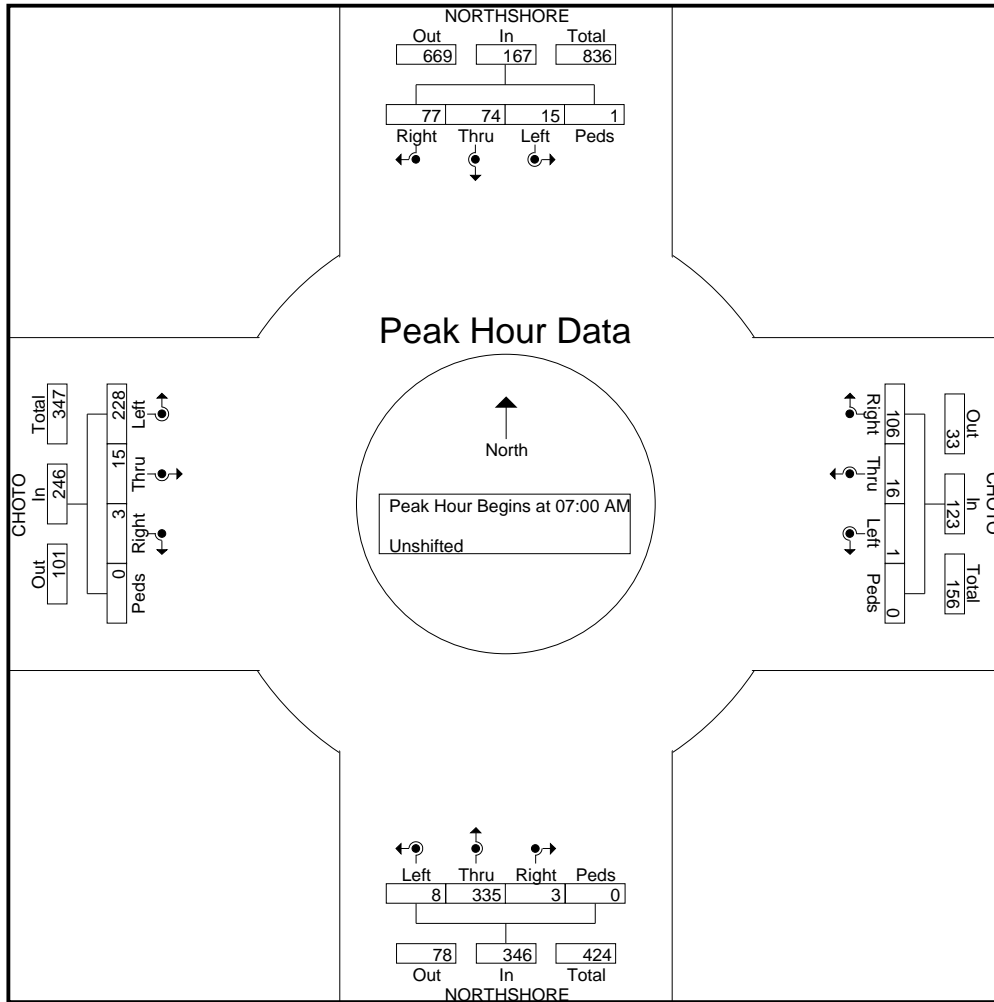
Counted by: Allyson Foster

File Name : choto\_round  
 Site Code : 00000000  
 Start Date : 11/19/2014  
 Page No : 1

Groups Printed- Unshifted

Start Time	NORTHSHORE Southbound					CHOTO Westbound					NORTHSHORE Northbound					CHOTO Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	6	15	10	0	31	0	0	19	0	19	1	106	0	0	107	73	4	0	0	77	234
07:15 AM	1	15	17	0	33	1	6	32	0	39	3	73	0	0	76	86	5	0	0	91	239
07:30 AM	3	17	22	1	43	0	6	44	0	50	3	66	1	0	70	48	2	1	0	51	214
07:45 AM	5	27	28	0	60	0	4	11	0	15	1	90	2	0	93	21	4	2	0	27	195
Total	15	74	77	1	167	1	16	106	0	123	8	335	3	0	346	228	15	3	0	246	882
08:00 AM	4	16	12	0	32	1	4	31	0	36	1	30	1	0	32	58	8	3	0	69	169
08:15 AM	12	26	29	2	69	2	8	19	0	29	2	74	2	0	78	42	6	1	0	49	225
08:30 AM	3	33	27	0	63	0	6	21	0	27	1	61	1	0	63	21	10	2	0	33	186
08:45 AM	13	19	13	0	45	0	8	10	0	18	3	57	0	0	60	29	1	2	0	32	155
Total	32	94	81	2	209	3	26	81	0	110	7	222	4	0	233	150	25	8	0	183	735
*** BREAK ***																					
04:00 PM	15	51	46	2	114	0	6	11	0	17	5	24	0	0	29	24	6	6	0	36	196
04:15 PM	11	56	53	0	120	1	4	10	1	16	2	24	0	0	26	21	4	4	0	29	191
04:30 PM	17	61	44	0	122	2	3	5	0	10	0	39	0	0	39	28	5	1	0	34	205
04:45 PM	19	45	51	0	115	0	7	13	0	20	3	48	2	0	53	26	5	6	0	37	225
Total	62	213	194	2	471	3	20	39	1	63	10	135	2	0	147	99	20	17	0	136	817
05:00 PM	23	63	43	0	129	2	3	12	0	17	3	47	0	0	50	34	8	4	0	46	242
05:15 PM	15	60	28	0	103	0	0	15	0	15	2	28	0	0	30	32	4	5	1	42	190
05:30 PM	18	62	53	0	133	0	5	8	0	13	1	53	3	1	58	25	10	3	0	38	242
05:45 PM	8	59	55	0	122	0	1	5	0	6	5	43	4	0	52	19	4	5	0	28	208
Total	64	244	179	0	487	2	9	40	0	51	11	171	7	1	190	110	26	17	1	154	882
Grand Total	173	625	531	5	1334	9	71	266	1	347	36	863	16	1	916	587	86	45	1	719	3316
Apprch %	13	46.9	39.8	0.4		2.6	20.5	76.7	0.3		3.9	94.2	1.7	0.1		81.6	12	6.3	0.1		
Total %	5.2	18.8	16	0.2	40.2	0.3	2.1	8	0	10.5	1.1	26	0.5	0	27.6	17.7	2.6	1.4	0	21.7	

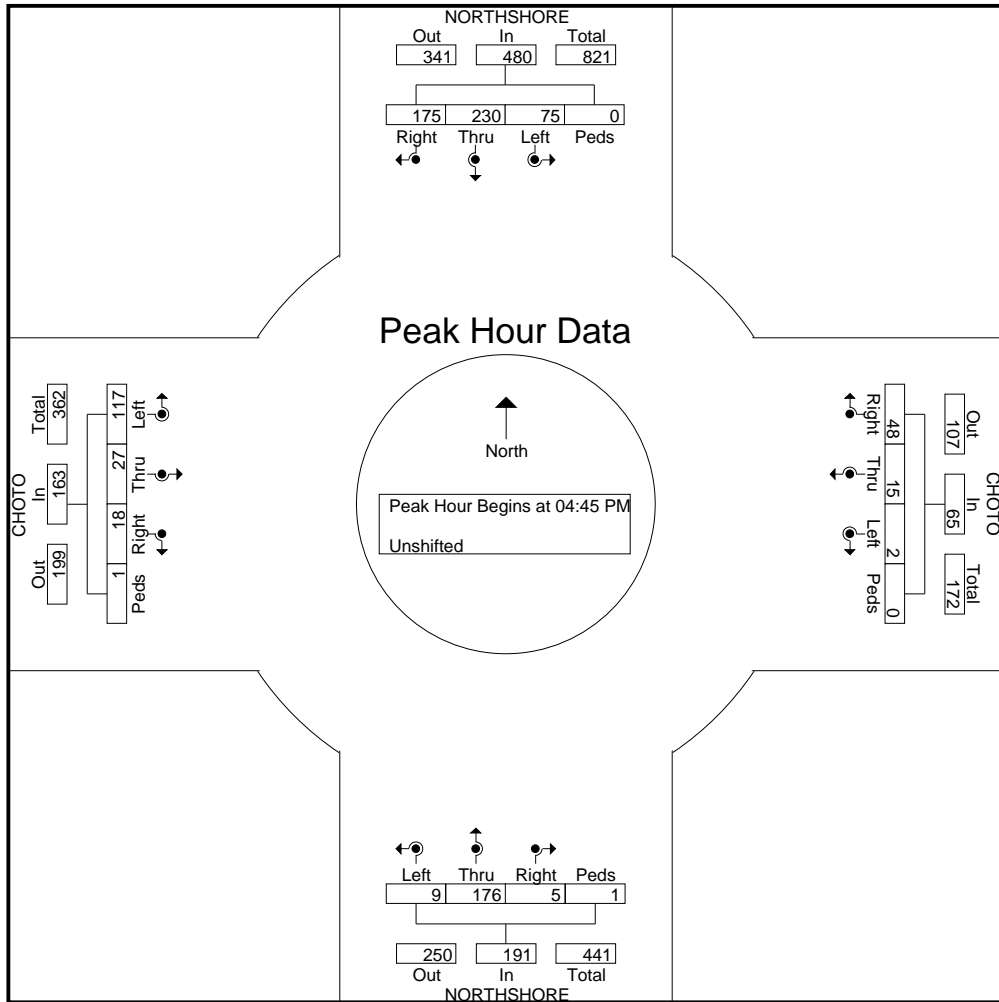
Start Time	NORTHSHORE Southbound					CHOTO Westbound					NORTHSHORE Northbound					CHOTO Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	6	15	10	0	31	0	0	19	0	19	1	106	0	0	107	73	4	0	0	77	234
07:15 AM	1	15	17	0	33	1	6	32	0	39	3	73	0	0	76	86	5	0	0	91	239
07:30 AM	3	17	22	1	43	0	6	44	0	50	3	66	1	0	70	48	2	1	0	51	214
07:45 AM	5	27	28	0	60	0	4	11	0	15	1	90	2	0	93	21	4	2	0	27	195
Total Volume	15	74	77	1	167	1	16	106	0	123	8	335	3	0	346	228	15	3	0	246	882
% App. Total	9	44.3	46.1	0.6		0.8	13	86.2	0		2.3	96.8	0.9	0		92.7	6.1	1.2	0		
PHF	.625	.685	.688	.250	.696	.250	.667	.602	.000	.615	.667	.790	.375	.000	.808	.663	.750	.375	.000	.676	.923



**CDM SMITH Inc.**  
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File Name : choto\_round  
 Site Code : 00000000  
 Start Date : 11/19/2014  
 Page No : 3

Start Time	NORTHSHORE Southbound					CHOTO Westbound					NORTHSHORE Northbound					CHOTO Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	19	45	51	0	115	0	7	13	0	20	3	48	2	0	53	26	5	6	0	37	225
05:00 PM	23	63	43	0	129	2	3	12	0	17	3	47	0	0	50	34	8	4	0	46	242
05:15 PM	15	60	28	0	103	0	0	15	0	15	2	28	0	0	30	32	4	5	1	42	190
05:30 PM	18	62	53	0	133	0	5	8	0	13	1	53	3	1	58	25	10	3	0	38	242
Total Volume	75	230	175	0	480	2	15	48	0	65	9	176	5	1	191	117	27	18	1	163	899
% App. Total	15.6	47.9	36.5	0		3.1	23.1	73.8	0		4.7	92.1	2.6	0.5		71.8	16.6	11	0.6		
PHF	.815	.913	.825	.000	.902	.250	.536	.800	.000	.813	.750	.830	.417	.250	.823	.860	.675	.750	.250	.886	.929



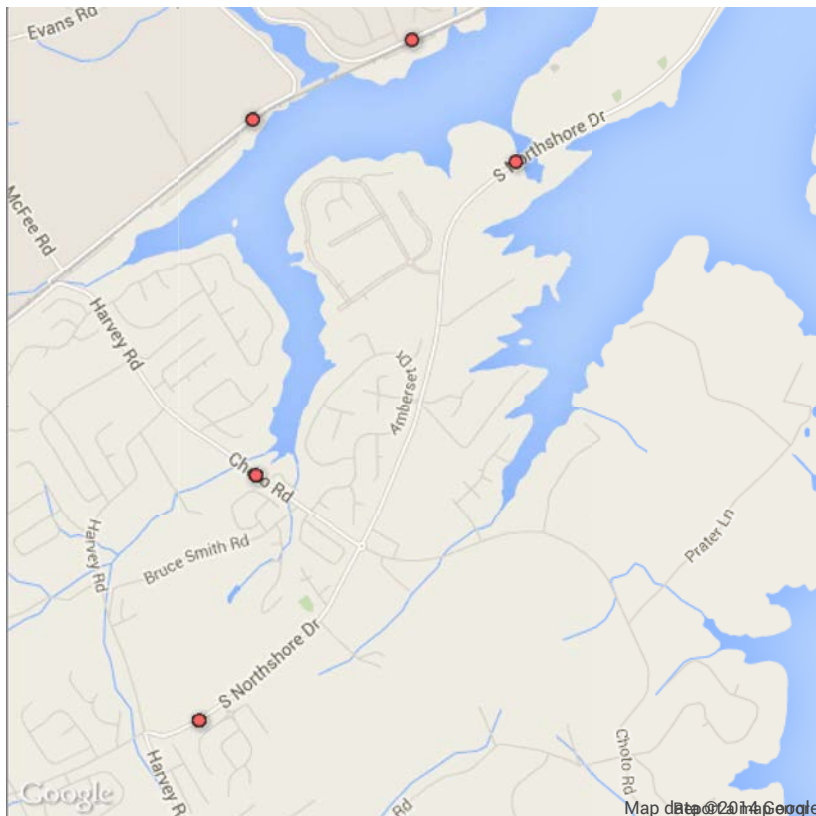


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**Traffic History** reflects the Annual Average Daily Traffic (AADT) count along specific locations on Tennessee's road network

View stations on map:  Non-Map Record Search:  Station Number:



**Station Information**

Station	000362
Route	01135
Location	SOUTH OF FARRAGUT
County	Knox
2013	3012
2012	2927
2011	3033
2010	3096
2009	2568
2008	2768
2007	3210
2006	3363
2005	3249
2004	3221
2003	2809
2002	2143
2001	2000
2000	2405
1999	1397
1998	1265
1997	1418
1996	1396
1995	1534
1994	1413
1993	1195

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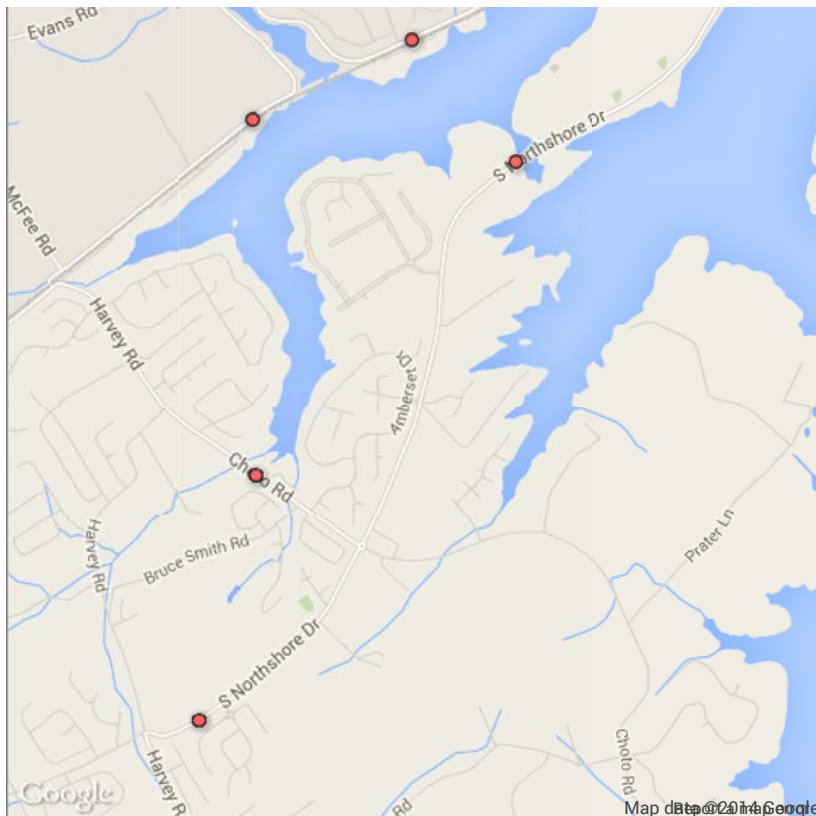


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**Traffic History** reflects the Annual Average Daily Traffic (AADT) count along specific locations on Tennessee's road network

View stations on map:  Non-Map Record Search:  Station Number:



Station Information	
Station	000141
Route	02364
Location	SHADY GROVE RD-NEAR LOUDON CO LINE
County	Knox
2013	4184
2012	3378
2011	3036
2010	3280
2009	2893
2008	2961
2007	2967
2006	2973
2005	2682
2004	2398
2003	2258
2002	2514
2001	1899
2000	2255
1999	1725
1998	1801
1997	1664
1996	1668
1995	1635
1994	1317
1993	1322

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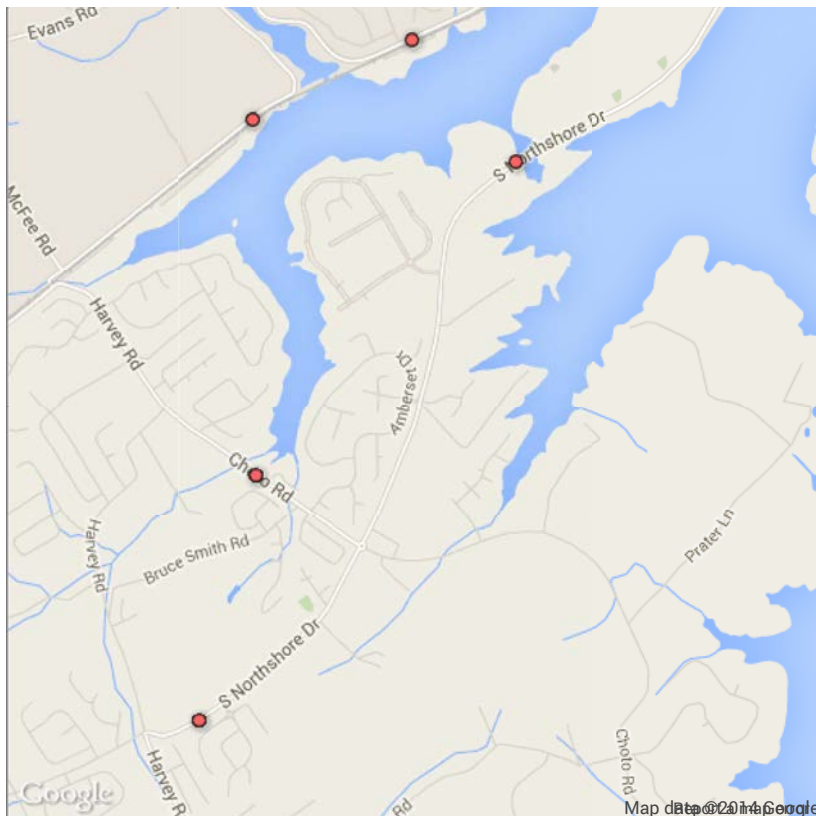


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**Traffic History** reflects the Annual Average Daily Traffic (AADT) count along specific locations on Tennessee's road network

View stations on map:  Non-Map Record Search:  Station Number:



**Station Information**

Station	000297
Route	01135
Location	NEAR LOUDON CO LINE
County	Knox
2013	10230
2012	9136
2011	8448
2010	9063
2009	7594
2008	8194
2007	7561
2006	8003
2005	11292
2004	6046
2003	6001
2002	5563
2001	5375
2000	6473
1999	4319
1998	4338
1997	4224
1996	3984
1995	3982
1994	3470
1993	3685

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










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Volume  
3: S Northshore Dr & Choto Rd













2014 Existing AM Peak  
Shady Glen TIS

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	228	15	3	1	16	106	8	335	3	15	74	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.66	0.75	0.38	0.25	0.67	0.60	0.67	0.79	0.38	0.62	0.68	0.69
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	345	20	8	4	24	177	12	424	8	24	109	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	373	0	0	205	0	0	444	0	0	245	0
Intersection Summary												







Intersection				
Intersection Delay, s/veh	10.8			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	373	205	444	245
Demand Flow Rate, veh/h	380	209	452	249
Vehicles Circulating, veh/h	139	796	396	40
Vehicles Exiting, veh/h	150	52	123	965
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.0	14.2	14.6	5.5
Approach LOS	A	B	B	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	380	209	452	249
Cap Entry Lane, veh/h	983	510	760	1086
Entry HV Adj Factor	0.981	0.979	0.981	0.983
Flow Entry, veh/h	373	205	444	245
Cap Entry, veh/h	964	499	746	1067
V/C Ratio	0.386	0.410	0.594	0.229
Control Delay, s/veh	8.0	14.2	14.6	5.5
LOS	A	B	B	A
95th %tile Queue, veh	2	2	4	1

Volume  
3: S Northshore Dr & Choto Rd

2014 Existing PM Peak  
Shady Glen TIS













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	117	27	18	2	15	48	9	176	5	75	230	175
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.68	0.25	0.25	0.54	0.80	0.75	0.83	0.42	0.82	0.91	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	136	40	72	8	28	60	12	212	12	91	253	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	96	0	0	236	0	0	557	0
Intersection Summary												

Intersection				
Intersection Delay, s/veh	8.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	248	96	236	557
Demand Flow Rate, veh/h	253	98	240	568
Vehicles Circulating, veh/h	359	367	273	49
Vehicles Exiting, veh/h	258	146	339	416
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	6.0	7.3	9.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	253	98	240	568
Cap Entry Lane, veh/h	789	783	860	1076
Entry HV Adj Factor	0.981	0.984	0.982	0.981
Flow Entry, veh/h	248	96	236	557
Cap Entry, veh/h	774	770	845	1055
V/C Ratio	0.321	0.125	0.279	0.528
Control Delay, s/veh	8.4	6.0	7.3	9.8
LOS	A	A	A	A
95th %tile Queue, veh	1	0	1	3

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	0	0	0	0	0	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
<b>Intersection Summary</b>						

Volume  
3: S Northshore Dr & Choto Rd

2020 Background AM Peak  
Shady Glen TIS













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	323	26	4	4	24	149	11	470	6	22	109	113
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	351	28	4	4	26	162	12	511	7	24	118	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	383	0	0	192	0	0	530	0	0	265	0
<b>Intersection Summary</b>												

Intersection				
Intersection Delay, s/veh	13.4			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	383	192	530	265
Demand Flow Rate, veh/h	391	196	540	269
Vehicles Circulating, veh/h	148	891	411	43
Vehicles Exiting, veh/h	164	60	128	1044
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.3	15.7	20.1	5.7
Approach LOS	A	C	C	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	391	196	540	269
Cap Entry Lane, veh/h	974	464	749	1082
Entry HV Adj Factor	0.981	0.982	0.981	0.984
Flow Entry, veh/h	383	192	530	265
Cap Entry, veh/h	956	455	735	1065
V/C Ratio	0.401	0.423	0.721	0.249
Control Delay, s/veh	8.3	15.7	20.1	5.7
LOS	A	C	C	A
95th %tile Queue, veh	2	2	6	1



Volume  
3: S Northshore Dr & Choto Rd













2020 Background PM Peak  
Shady Glen TIS

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	185	56	24	17	34	77	12	277	13	111	356	282
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	201	61	26	18	37	84	13	301	14	121	387	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	288	0	0	139	0	0	328	0	0	815	0
Intersection Summary												

Intersection				
Intersection Delay, s/veh	15.0			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	288	139	328	815
Demand Flow Rate, veh/h	294	142	334	831
Vehicles Circulating, veh/h	536	525	390	69
Vehicles Exiting, veh/h	364	199	440	598
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	12.2	8.0	10.6	19.0
Approach LOS	B	A	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	294	142	334	831
Cap Entry Lane, veh/h	661	668	765	1055
Entry HV Adj Factor	0.979	0.981	0.982	0.981
Flow Entry, veh/h	288	139	328	815
Cap Entry, veh/h	647	656	751	1035
V/C Ratio	0.445	0.212	0.437	0.788
Control Delay, s/veh	12.2	8.0	10.6	19.0
LOS	B	A	B	C
95th %tile Queue, veh	2	1	2	9

Volume  
3: S Northshore Dr & Choto Rd







2020 Buildout AM Peak  
Shady Glen TIS

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	323	26	6	4	24	149	15	546	8	22	134	113
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	351	28	7	4	26	162	16	593	9	24	146	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	386	0	0	192	0	0	618	0	0	293	0
Intersection Summary												

Intersection				
Intersection Delay, s/veh	17.9			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	386	192	618	293
Demand Flow Rate, veh/h	394	196	630	298
Vehicles Circulating, veh/h	177	979	411	47
Vehicles Exiting, veh/h	168	62	160	1128
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.7	18.1	29.3	6.1
Approach LOS	A	C	D	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	394	196	630	298
Cap Entry Lane, veh/h	947	425	749	1078
Entry HV Adj Factor	0.981	0.982	0.981	0.983
Flow Entry, veh/h	386	192	618	293
Cap Entry, veh/h	928	417	735	1060
V/C Ratio	0.416	0.462	0.841	0.276
Control Delay, s/veh	8.7	18.1	29.3	6.1
LOS	A	C	D	A
95th %tile Queue, veh	2	2	10	1

Volume  
6: S Northshore Dr & Site Ent

2020 Buildout AM Peak  
Shady Glen TIS

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	4	82	487	1	28	117
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	4	89	529	1	30	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	93	0	530	0	0	157
<b>Intersection Summary</b>						

**Intersection**

Int Delay, s/veh 1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	4	82	487	1	28	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	89	529	1	30	127













Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	718	530	0
Stage 1	530	-	-
Stage 2	188	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	396	549	1037
Stage 1	590	-	-
Stage 2	844	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	384	549	1037
Mov Cap-2 Maneuver	384	-	-
Stage 1	590	-	-
Stage 2	818	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	538	1037	-
HCM Lane V/C Ratio	-	-	0.174	0.029	-
HCM Control Delay (s)	-	-	13.1	8.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Volume  
3: S Northshore Dr & Choto Rd

2020 Buildout PM Peak  
Shady Glen TIS







												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	185	56	31	17	35	77	15	326	14	111	439	282
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	201	61	34	18	38	84	16	354	15	121	477	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	296	0	0	140	0	0	385	0	0	905	0
Intersection Summary												

Intersection				
Intersection Delay, s/veh	19.9			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	296	140	385	905
Demand Flow Rate, veh/h	302	143	392	923
Vehicles Circulating, veh/h	628	582	390	73
Vehicles Exiting, veh/h	368	200	540	652
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.6	8.6	12.3	26.7
Approach LOS	B	A	B	D
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	302	143	392	923
Cap Entry Lane, veh/h	603	631	765	1050
Entry HV Adj Factor	0.979	0.981	0.982	0.981
Flow Entry, veh/h	296	140	385	905
Cap Entry, veh/h	591	619	751	1030
V/C Ratio	0.501	0.226	0.512	0.879
Control Delay, s/veh	14.6	8.6	12.3	26.7
LOS	B	A	B	D
95th %tile Queue, veh	3	1	3	12



Volume  
6: S Northshore Dr & Site Ent

2020 Buildout PM Peak  
Shady Glen TIS

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Volume (vph)	3	53	304	5	90	397
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	3	58	330	5	98	432
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	335	0	0	530
<b>Intersection Summary</b>						

**Intersection**

Int Delay, s/veh 1.6

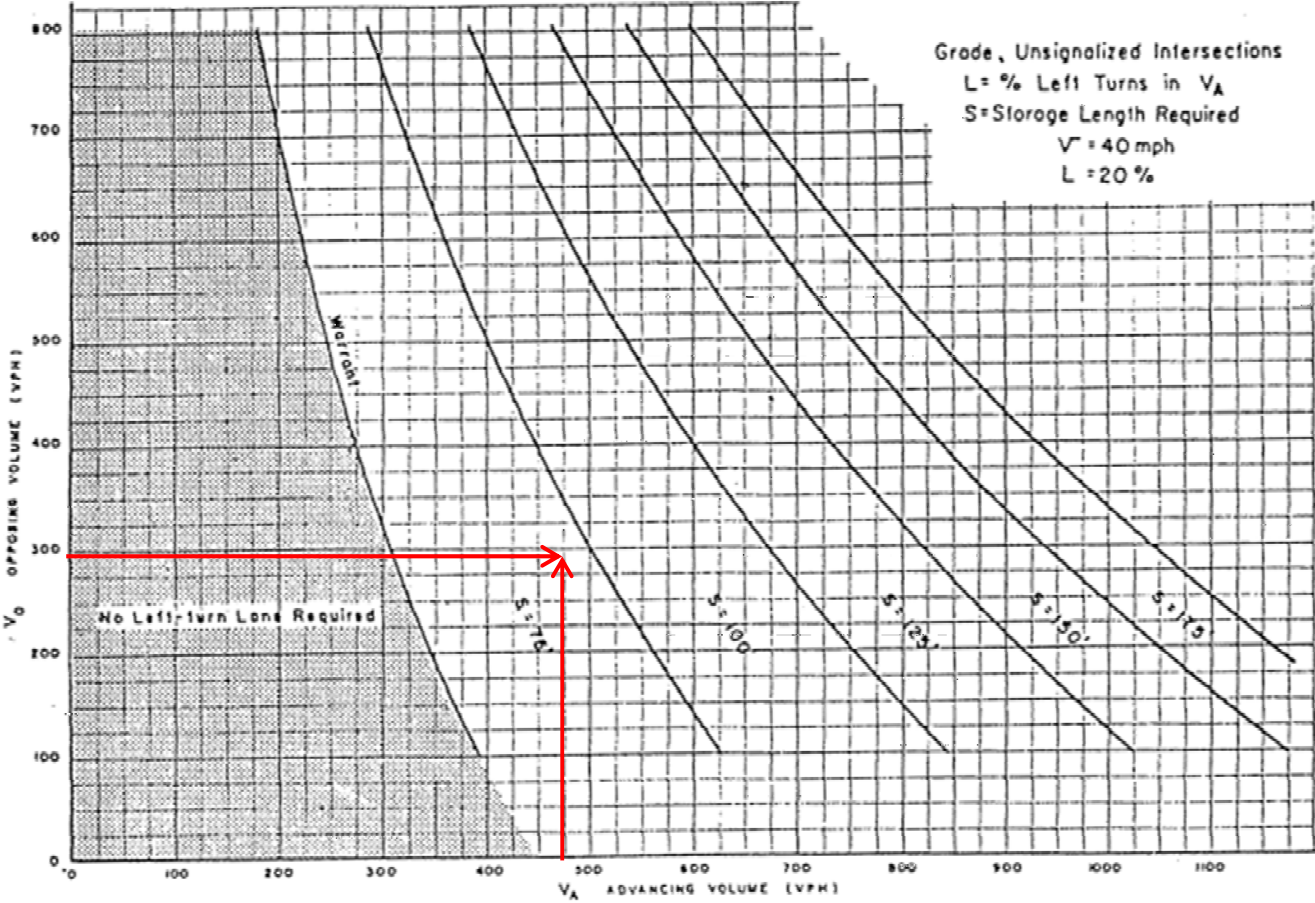
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	3	53	304	5	90	397
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	58	330	5	98	432

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	960	333	0
Stage 1	333	-	-
Stage 2	627	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	285	709	1223
Stage 1	726	-	-
Stage 2	532	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	255	709	1223
Mov Cap-2 Maneuver	255	-	-
Stage 1	726	-	-
Stage 2	476	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	647	1223	-
HCM Lane V/C Ratio	-	-	0.094	0.08	-
HCM Control Delay (s)	-	-	11.1	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

# PM PEAK HOUR LEFT-TURN LANE ANALYSIS



**RIGHT-TURN LANE VOLUME THRESHOLDS  
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

**PM PEAK HOUR**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99				Yes	Yes Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

**AM PEAK HOUR**



**CDM  
Smith**

