

**The Preserve at Greystone Summit  
Traffic Impact Study  
Greystone Summit Blvd  
Knoxville, TN**

Submitted to

**Knoxville – Knox County Metropolitan Planning  
Commission**

Revised June 4, 2012  
May 2012  
FMA Project Number: 223.005



Submitted By:



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## **1.0 SITE DESCRIPTION**

The proposed site access is a single driveway approximately 680 feet west of the intersection of Greystone Summit Boulevard and Solway Road. The proposed Preserve at Greystone Summit Apartments will consist of approximately 296 apartment units by the year 2015. The location of the site is shown in Figure 1 and the site layout is shown in Figure 2.

During a site visit it was determined that Greystone Summit Boulevard is a two-lane road at the point of the proposed single driveway. The Knoxville Regional Transportation Planning Organization (TPO) classifies Greystone Summit Boulevard as a local street. There is not a posted speed limit on Greystone Summit Boulevard; therefore, a speed limit of 25 mph was used for a local street. The intersection site distance at the proposed single driveway was measured to be approximately 325 feet east and approximately 500 feet west of the intersection. The intersection of Greystone Summit Boulevard and Solway Road is currently a T-intersection controlled by a stop sign on the minor approach. The current intersection geometry shows that Solway Road is a two-way two-lane Major Collector. The current speed limit on Solway Road is 40 mph.

## **2.0 EXISTING TRAFFIC CONDITIONS**

FMA conducted an eight-hour turning movement count at the intersection of Greystone Summit Blvd and Solway Road on Tuesday, May 1, 2012. The existing volume including the AM and PM peak hour traffic volumes at the count location is shown in Figure 3 and the count data collected is included in Attachment 1.

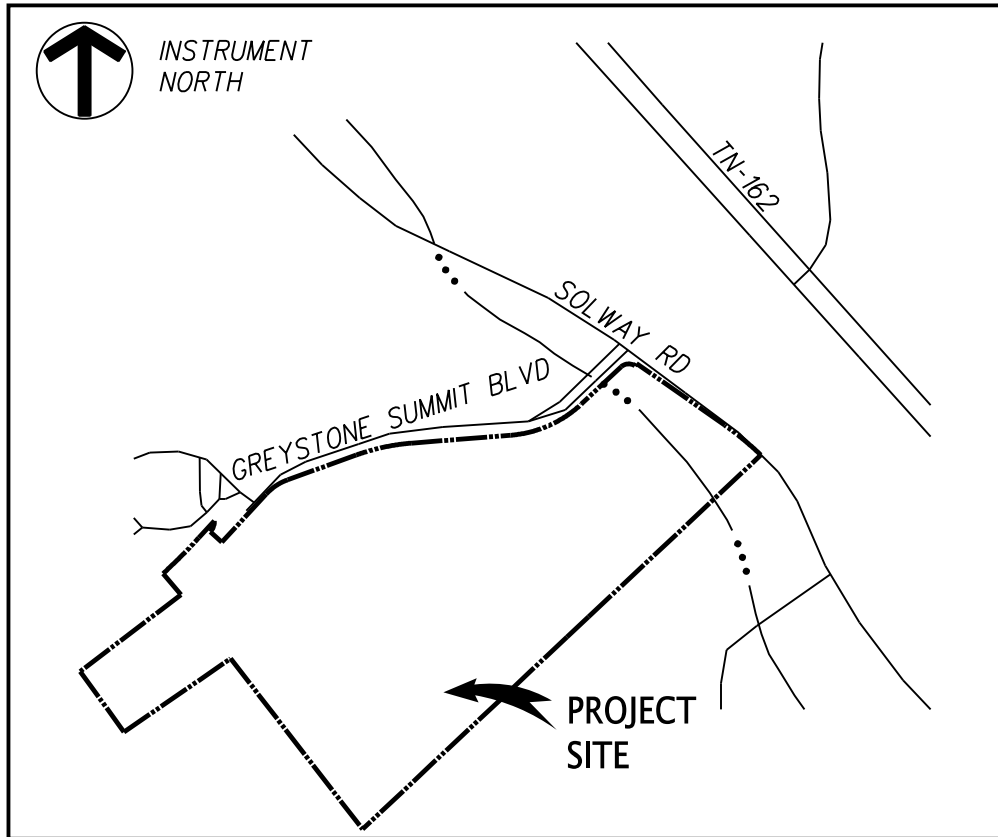
The current AM peak hour, and PM peak hour were determined using the eight-hour turning movement count. The AM peak hour occurred between 7:30 am and 8:30 am and the PM peak hour occurred between 5:00 pm and 6:00 pm.

## **3.0 BACKGROUND GROWTH**

The Tennessee Department of Transportation (TDOT) maintains count Station #000084 on Hardin Valley Road East of Pellissippi Parkway and South of the intersection of Greystone Summit Boulevard and Solway Road. The annual traffic growth rate for Station #000084

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FIGURE 1



LOCATION MAP  
(NOT TO SCALE)

LOCATION MAP

**THE PRESERVE AT  
GREYSTONE SUMMIT**

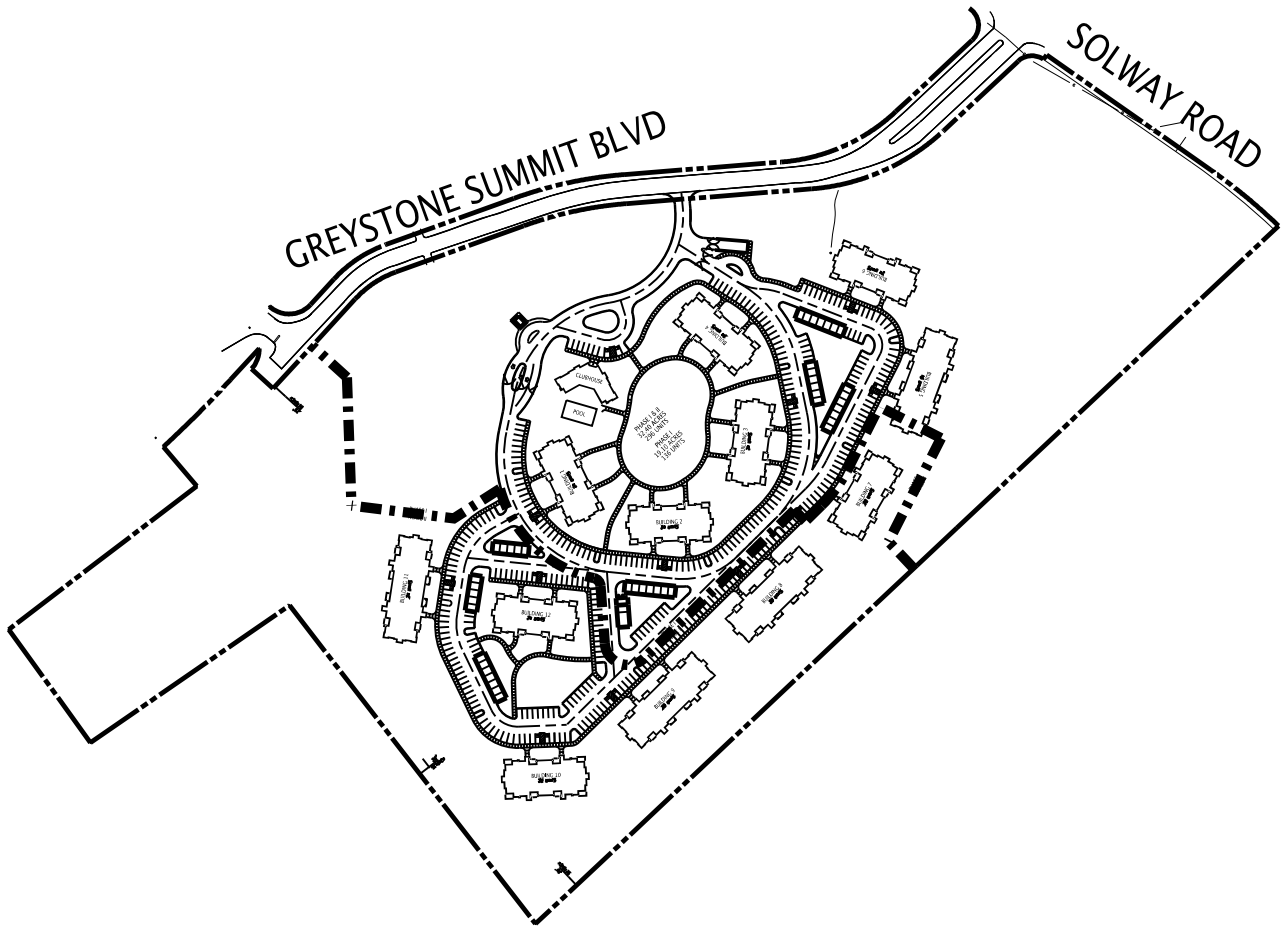
KNOX COUNTY, TN

DRAWN BY ALK      DATE 5/21/12



10330 HARDIN VALLEY ROAD  
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FIGURE 2



SITE PLAN

**THE PRESERVE AT  
GREYSTONE SUMMIT**

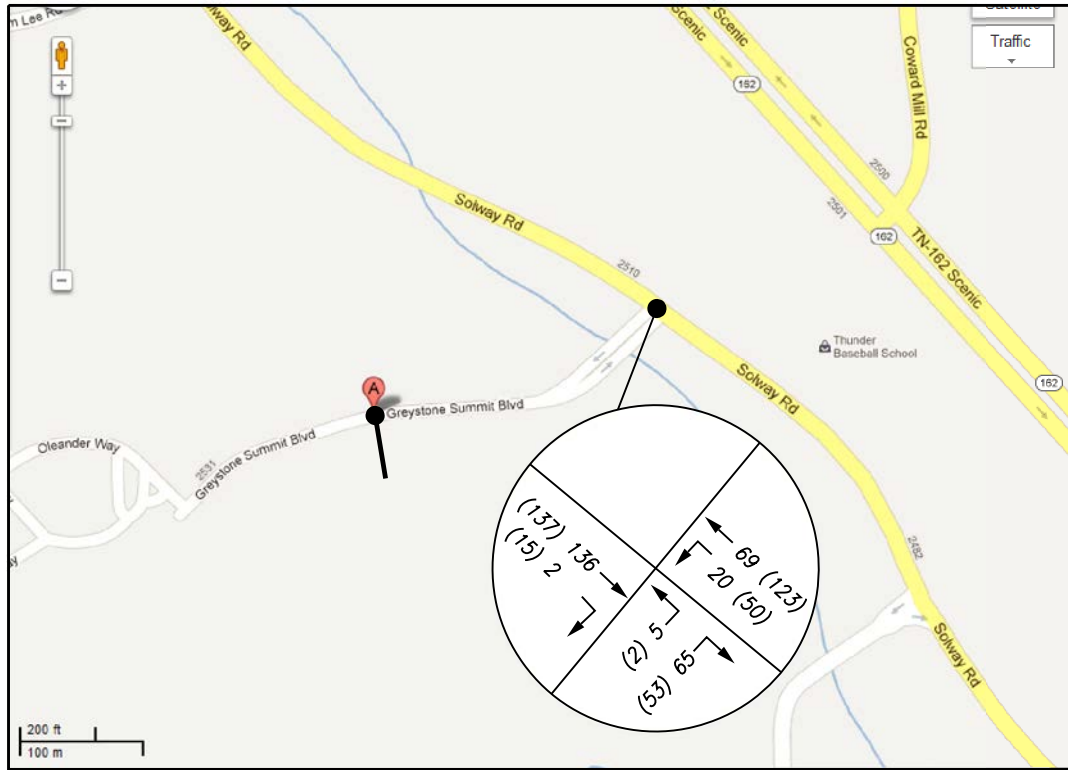
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FIGURE 3



**LEGEND:**

← 5 (16)      TURNING MOVEMENT VOLUME AM (PM)

YEAR 2012 PEAK HOUR TRAFFIC

**THE PRESERVE AT GREYSTONE SUMMIT**

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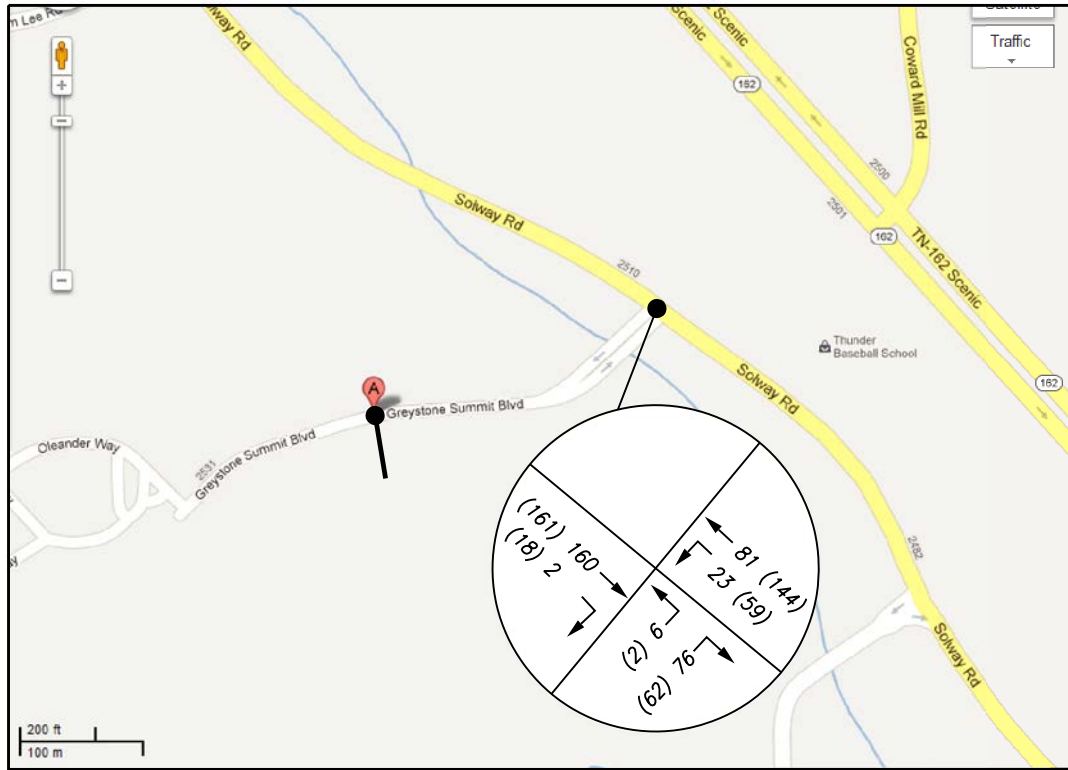
between 2001 and 2010 is approximately 5.5% and is referenced in Attachment 2. There was a greater than 30% increase between 2010 and 2011 so that point on the graph was not used to determine the average growth rate. For the purpose of this study, an annual growth rate of 5.5% was assumed until full occupancy is reached in 2015. Figure 4 demonstrates the projected peak hour volumes at the intersection of Greystone Summit Boulevard and Solway Road after applying this background growth rate to the existing conditions.

#### **4.0 TRIP GENERATION AND TRIP DISTRIBUTION**

Table 3-1 shows the weekday, AM peak hour and PM peak hour trips that the proposed Preserve at Greystone Summit apartments is expected to generate at the point of full occupancy. The *Trip Generation, 7<sup>th</sup> Edition*, published by the Institute of Transportation Engineers, was used to estimate volumes based on locally gathered trip generation data. The Knoxville-Knox County Metropolitan Planning Commission published a memorandum (“Local Trip Generation Rates for Multi-Family Residential Uses”, August 14, 2000, contained in Attachment 3) for the purpose of providing locally collected data for all multi-family residential developments.

The directional distribution of the traffic generated by the proposed Preserve at Greystone Summit was determined using the traffic data collected for the current conditions. The typical weekday traffic pattern is for traffic to flow heavier in one direction in the morning peak period and then for the traffic to be heavier in the opposite direction during the evening peak period. For Solway Road, the current directional distribution during the AM peak hour is 39% northbound and 61% southbound. The directional distribution in the PM peak hour is 53% northbound and 47% southbound. Using these percentages the trips generated from The Preserve at Greystone Summit are shown in Figure 5. Figure 6 shows the combined peak hour traffic from the future growth and the proposed development.

FIGURE 4



**LEGEND:**

← 5 (16)      TURNING MOVEMENT VOLUME AM (PM)

YEAR 2015 PEAK HOUR TRAFFIC  
WITHOUT DEVELOPMENT

**THE PRESERVE AT  
GREYSTONE SUMMIT**

KNOX COUNTY, TN

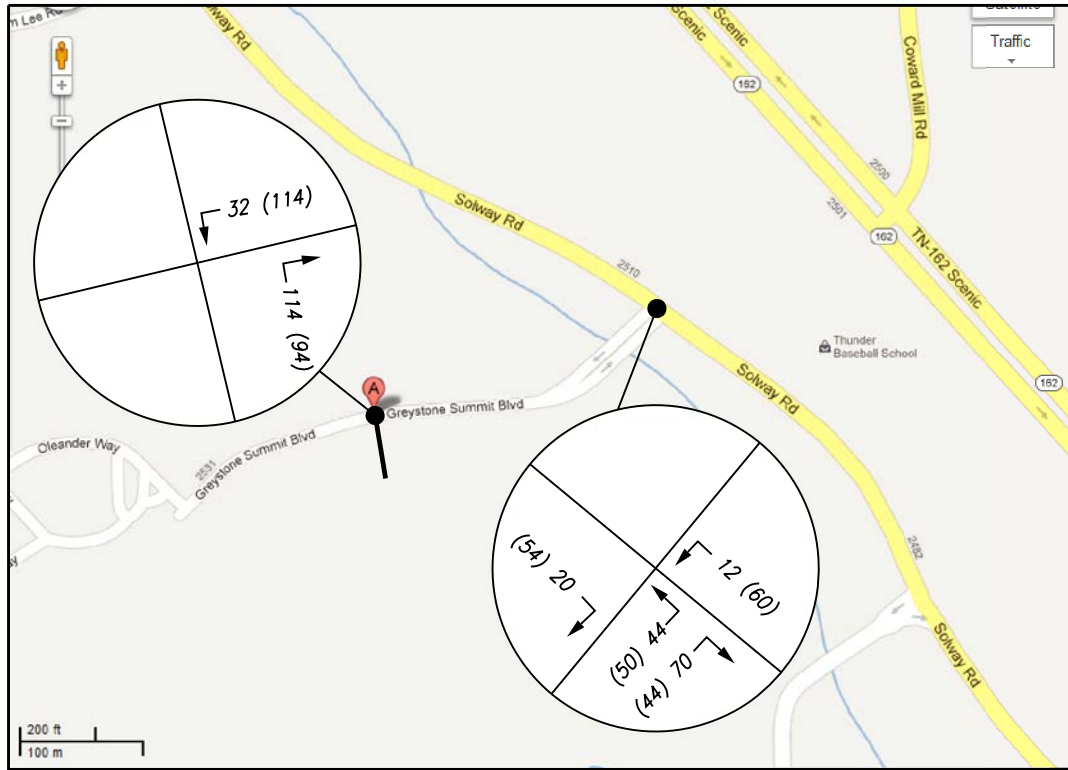
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FIGURE 5



**LEGEND:**

← 5 (16)      TURNING MOVEMENT VOLUME AM (PM)

**DIRECTIONAL DISTRIBUTION:**

SOLWAY ROAD

AM PEAK      39% NORTHBOUND →  
                   61% SOUTHBOUND ←

PM PEAK      53% NORTHBOUND →  
                   47% SOUTHBOUND ←

YEAR 2015 PEAK HOUR  
 SITE DEVELOPMENT TRAFFIC

**THE PRESERVE AT  
 GREYSTONE SUMMIT**

KNOX COUNTY, TN

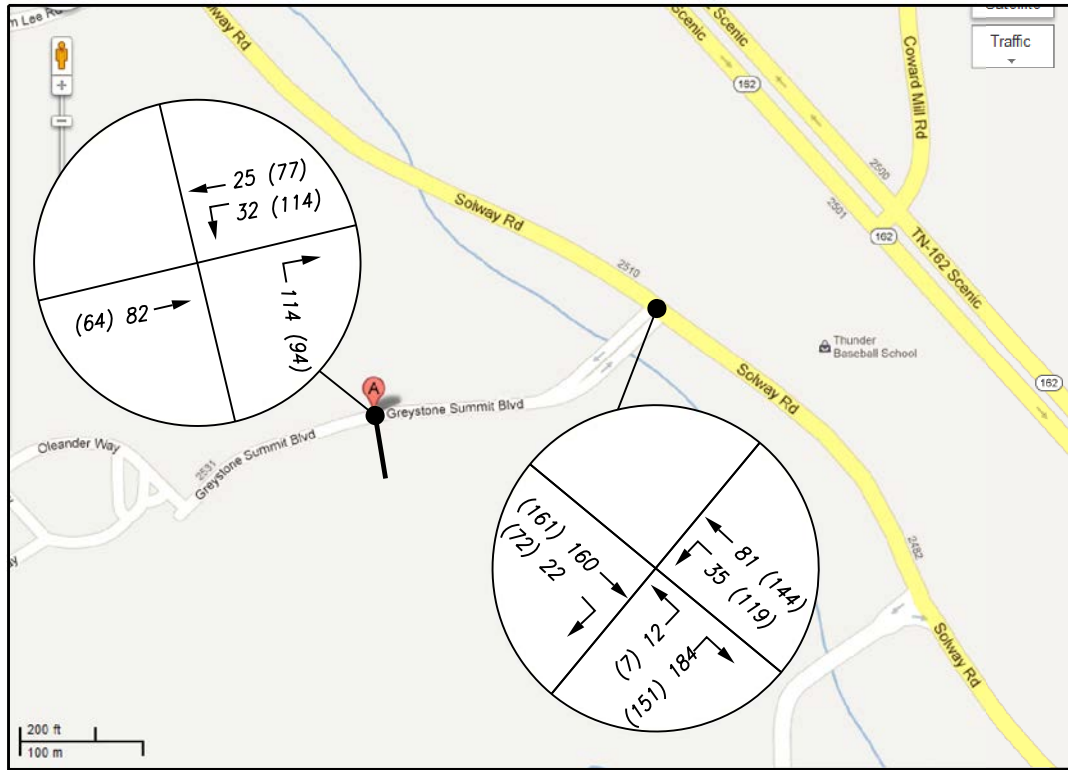
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FIGURE 6



**LEGEND:**

← 5 (16)      TURNING MOVEMENT VOLUME AM (PM)

YEAR 2015 PEAK HOUR TRAFFIC  
WITH DEVELOPMENT

**THE PRESERVE AT  
GREYSTONE SUMMIT**

KNOX COUNTY, TN

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**Table 3-1  
 Trip Generation Summary  
 Rates for Local Apartment Trip Generation Study**

	Total New Trips	% Entering	% Exiting	Number Entering	Number Exiting
Weekday	2531	50	50	1266	1266
A.M. Peak	146	22	78	32	114
P.M. Peak	208	55	45	114	94

**5.0 TRAFFIC CONDITIONS**

Unsignalized intersection capacity analyses were performed for the AM and PM peak hours to evaluate the traffic conditions at the intersection of Greystone Summit Boulevard and Solway Road as well as the intersection of Greystone Summit Boulevard and the proposed single driveway. The capacity analyses were determined from the Highway Capacity Software (HCS 2000) which is based on the *2000 Highway Capacity Manual*. The results from the analyses are measured with a term “level of service” (LOS), which is based on the amount of delay experienced at the intersection. The LOS index ranges from LOS A, indicating excellent traffic conditions with minimal delay, to LOS F indicating very congested conditions with excessive delay. LOS D generally is considered the minimum acceptable condition in urban areas. Table 4-1 shows the results of the capacity analyses on both approaches of the intersection and the project entrance driveway.

**Table 4-1  
 Level of Service (LOS) Summary**

	Current Traffic		Future Traffic		Proposed Traffic	
	AM	PM	AM	PM	AM	PM
Solway Road & Greystone Summit Blvd	A	A	A	A	A	A
Greystone Summit Blvd & Proposed Driveway	-	-	-	-	A	A

## **6.0 TURN LANE WARRANT ANALYSIS**

The intersection of Greystone Summit Boulevard and the proposed single driveway was evaluated to determine if a left turn lane into the site or a right turn lane out of the site was warranted. The intersection of Solway Road and Greystone Summit Boulevard was also evaluated to determine if a right turn lane or left turn lane was warranted from the major approach. The Knox County Department of Engineering and Public Works handbook, "Access Control and Driveway Design Policy," was used to analyze the information. Attachment 8 shows a more detailed evaluation of the turn lane warrants.

Based on these evaluations a right turn lane out of and a left turn lane into The Preserve at Greystone Summit is not warranted for the proposed future traffic. On Solway Road neither a right turn lane from nor left turn lane onto Greystone Summit Blvd, will be warranted with the proposed future development.

## **7.0 CONCLUSIONS AND RECOMMENDATIONS**

### **A. Sight Distance**

The minimum required sight distance for a road with a posted speed limit of 25 mph is 275 feet in each direction in accordance with the "Minimum Subdivision Regulations" for Knoxville and Knox County. With a sight distance of approximately 325 ft east and approximately 500 ft west of the intersection, this requirement is met. FMA recommends any necessary landscaping and/or grading that may be involved to maintain this sight distance and continue to comply with Knox County Engineering & Public Works.

### **B. Intersection Spacing**

Greystone Summit Boulevard is classified as a local street. The minimum intersection spacing required for a local street is approximately 125 feet per the "Minimum Subdivision Regulations" for Knoxville and Knox County. The nearest road intersection to the project entrance is currently 680 feet west at the intersection of Greystone Summit Boulevard and Solway Road.

This intersection exceeds the typical minimum separation of 125 feet between roads on a local street; therefore, no change is necessary.

C. Turn lanes (Proposed Site Driveway and Greystone Summit Boulevard)

A southbound right turn lane and a northbound left turn lane are not warranted at the intersection of Solway Road and Greystone Summit Blvd. An eastbound right turn lane and a westbound left turn lane are not warranted at the intersection of Greystone Summit Blvd and the proposed project entrance.

**Attachment 1  
Traffic Counts**

**Attachment 1  
Traffic Count**

Project: The Preserve at Greystone Summit  
Date Conducted: 5/1/2012

Start	Solway Road Northbound			Solway Road Southbound			Greystone Summit Blvd Eastbound			Int. Total
	Thru	Left	Total	Right	Thru	Total	Right	Left	Total	
7:00 AM	8	2	10	0	39	39	15	2	17	66
7:15 AM	10	0	10	0	28	28	22	4	26	64
7:30 AM	17	2	19	0	45	45	22	1	23	87
7:45 AM	18	9	27	0	32	32	18	2	20	79
Total	53	13	66	0	144	144	77	9	86	296
8:00 AM	13	5	18	2	32	34	13	1	14	66
8:15 AM	21	4	25	0	27	27	12	1	13	65
8:30 AM	9	2	11	0	15	15	11	1	12	38
8:45 AM	6	2	8	0	17	17	10	0	10	35
Total	49	13	62	2	91	93	46	3	49	204
11:00 AM	15	2	17	0	15	15	3	1	4	36
11:15 AM	15	3	18	0	16	16	4	2	6	40
11:30 AM	11	3	14	1	19	20	11	0	11	45
11:45 AM	17	1	18	0	12	12	4	0	4	34
Total	58	9	67	1	62	63	22	3	25	155
12:00 PM	21	8	29	3	20	23	5	2	7	59
12:15 PM	11	9	20	1	18	19	6	1	7	46
12:30 PM	18	4	22	2	23	25	9	0	9	56
12:45 PM	15	10	25	1	13	14	4	0	4	43
Total	65	31	96	7	74	81	24	3	27	204
2:00 PM	14	6	20	0	13	13	3	0	3	36
2:15 PM	14	8	22	1	16	17	3	0	3	42
2:30 PM	16	6	22	1	18	19	6	1	7	48
2:45 PM	18	6	24	1	15	16	7	1	8	48
Total	62	26	88	3	62	65	19	2	21	174
3:00 PM	14	5	19	0	13	13	5	0	5	37
3:15 PM	23	4	27	1	25	26	7	0	7	60
3:30 PM	27	7	34	1	13	14	5	0	5	53
3:45 PM	28	11	39	2	27	29	5	0	5	73
Total	92	27	119	4	78	82	22	0	22	223
4:00 PM	25	18	43	1	19	20	7	0	7	70
4:15 PM	27	18	45	3	22	25	7	0	7	77
4:30 PM	31	12	43	4	33	37	10	0	10	90
4:45 PM	36	9	45	2	31	33	4	0	4	82
Total	119	57	176	10	105	115	28	0	28	319
5:00 PM	26	7	33	2	37	39	13	1	14	86
5:15 PM	34	18	52	5	39	44	9	1	10	106
5:30 PM	35	14	49	3	25	28	14	0	14	91
5:45 PM	28	11	39	5	36	41	17	0	17	97
Total	123	50	173	15	137	152	53	2	55	380
Grand Total	621	226	847	42	753	795	291	22	313	1955
Approach %	73.3	26.7		5.3	94.7		93.0	7.0		
Total %	31.8	11.6	43.3	2.1	38.5	40.7	14.9	1.1	16.0	

Project: The Preserve at Greystone Summit

Date Conducted: 5/1/2012

AM Peak Hour	7:30-8:30	297
Lunch Peak Hour	12:00-1:00	204
PM Peak Hour	5:00-6:00	380

Start	Solway Road Northbound			Solway Road Southbound			Greystone Summit Blvd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Thru	App. Total	Right	Left	App. Total	
Peak Hour Analysis from 7:00 AM to 9:00 AM										
AM Peak Hour begins at 7:45 AM										
7:30 AM	17	2	19	0	45	45	22	1	23	87
7:45 AM	18	9	27	0	32	32	18	2	20	79
8:00 AM	13	5	18	2	32	34	13	1	14	66
8:15 AM	21	4	25	0	27	27	12	1	13	65
Total Volume	69	20	89	2	136	138	65	5	70	297
Future (5.5% over 3 yrs)	81	23		2	160		76	6		349
PHF	0.82	0.56		0.25	0.76		0.74	0.63		0.85
Peak Hour Analysis from 11:00 AM to 1:00 PM										
Lunch Peak Hour begins at 11:45 AM										
12:00 PM	21	8	29	3	20	23	5	2	7	59
12:15 PM	11	9	20	1	18	19	6	1	7	46
12:30 PM	18	4	22	2	23	25	9	0	9	56
12:45 PM	15	10	25	1	13	14	4	0	4	43
Total Volume	65	31	96	7	74	81	24	3	27	204
Future (5.5% over 3 yrs)	76	36		8	87		28	4		240
PHF	0.77	0.78		0.58	0.80		0.67	0.38		0.86
Peak Hour Analysis from 2:00 PM to 6:00 PM										
PM Peak Hour begins at 4:15 PM										
5:00 PM	26	7	33	2	37	39	13	1	14	86
5:15 PM	34	18	52	5	39	44	9	1	10	106
5:30 PM	35	14	49	3	25	28	14	0	14	91
5:45 PM	28	11	39	5	36	41	17	0	17	97
Total Volume	123	50	173	15	137	152	53	2	55	380
Future (5.5% over 3 yrs)	144	59		18	161		62	2		446
PHF	0.88	0.69		0.75	0.88		0.78	0.50		0.90

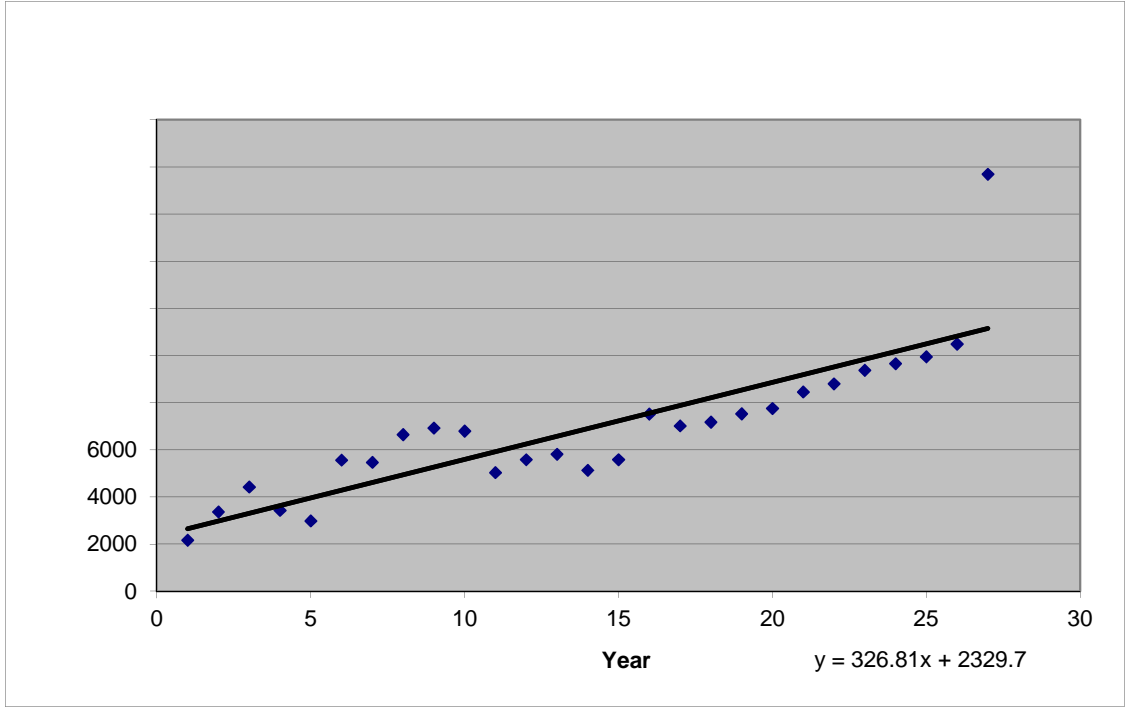


**Attachment 2**  
**ADT Trends**

**Attachment 2  
ADT Trends**

	Year	Adjusted Average Daily Traffic
1	1985	2171
2	1986	3372
3	1987	4427
4	1988	3436
5	1989	2989
6	1990	5568
7	1991	5473
8	1992	6651
9	1993	6929
10	1994	6800
11	1995	5037
12	1996	5589
13	1997	5820
14	1998	5137
15	1999	5587
16	2000	7520
17	2001	7019
18	2002	7179
19	2003	7533
20	2004	7761
21	2005	8457
22	2006	8804
23	2007	9379
24	2008	9660
25	2009	9950
26	2010	10492
27	2011	17696

Station # 84 County Knox Location Valley RD - Near Anderson Co Line Route # - Route Name -



Most Recent Trend Line Growth

Year	ADT
2001	7019
2010	10492

Annual Percent Growth 5.50%

**Attachment 3**  
**Local Apartment Trip Generation Study**



## MEMORANDUM

**To:** Traffic Impact Study Reviewers and Preparers (see attached list)

**From:** Mike Conger *ADC*

**Date:** August 14, 2000

**Subject:** Local Trip Generation Rates for Multi-Family Residential Uses

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Attached please find a summary of the final report with data plots for the Knox County Local Apartment Trip Generation Study. As you will recall, this report was discussed when the traffic impact study group last convened this past February. A consensus was reached at that meeting that the trip generation rates developed in the local study should be used for new apartment complexes and any other "multi-family" residential uses that are being proposed.

The MPC voted at its July 2000 meeting to officially amend the Traffic Impact Study Guidelines with language which reads that "trip generation rates for proposed uses shall be calculated using the latest edition of the ITE Trip Generation Manual, or using local data when it is available". This amendment allows the full implementation of the new rates, and they should be used for future proposed multi-family developments unless it can be demonstrated otherwise.

Thanks for your assistance and cooperation in this matter, if there are any questions or comments, please let me know.

## TRAFFIC IMPACT STUDY REVIEWER & PREPARER GROUP

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**KNOX COUNTY**  
**LOCAL APARTMENT TRIP GENERATION STUDY**

**PURPOSE**

A Traffic Impact Study (TIS) is currently required in Knox County when a proposed development is projected to generate in excess of 750 trips per day. The determinations of when the threshold is met as well as all subsequent analyses in the TIS are performed using the rates and equations given in the Institute of Transportation Engineers (ITE) Trip Generation Manual. Local governmental agencies rely heavily on the accuracy of these trip generation rates in order to correctly predict the impacts of a proposed development on the transportation system. Therefore, in certain instances, it is logical to verify whether the “national” rates and equations given in the ITE Trip Generation Manual are appropriate for use in a specific local area or region.

The decision was made to study the local trip-making characteristics of apartments because of the discrepancy between the trip generation rates for apartments and single family residential land uses as given in the ITE Trip Generation Manual. While these two land uses are similar in nature, the Trip Generation Manual predicts about three less trips per dwelling unit generated by apartments for the average weekday. Additionally the Trip Generation Manual points out that due to the age of their database, which dates back to the 1960’s, “the rates for apartments probably had changed over time”. It is also assumed that some of the ITE data had come from larger metropolitan areas with denser development and greater transit use than Knox County, which would contribute to lower trip generation rates. Therefore, this study will be used to either verify the rates given in the Trip Generation Manual or generate new ones that can be applied to locally proposed apartment developments.

**PROCEDURE**

The procedures recommended by ITE in conducting local trip generation studies were generally followed for this study, along with some important assumptions that have made. ITE has published a proposed recommended practice entitled “Trip Generation Handbook” which specifically outlines procedures for conducting local trip generation studies and establishing new rates and equations.

The first step in the study was to define the number and location of the sites to be studied, as well as the counting methodology. Initially 14 sites were selected, although one apartment complex – the College Park Apartments – was later omitted due to uncharacteristically high traffic generation numbers. The number of sites used in this study far exceeds the recommended minimum amount suggested by ITE, which is five sites. Traffic counts were taken for week-long periods at 15-minute intervals between July 22, 1996 and August 9, 1996 at the access points to the apartment complexes. A Technical Appendix to this report contains the traffic count data collected at each apartment complex.

## RESULTS

The traffic count data was analyzed using spreadsheets in order to determine the weighted average rates and regression equations. In order to be considered valid, the local rates and equations for each time period of analysis that were generated must meet certain statistical criteria. First, the standard deviation of the independent variable (dwelling units) should be no more than 110 percent of the weighted average rate; and secondly, the regression equations require a computed coefficient of determination ( $R^2$ ) value of at least 0.75 before good data fit is indicated. This statistical criteria is met by the local data results, and in fact it often exceeds the level of data fit given by their counterparts in the ITE Trip Generation Manual. Finally, in order to simplify the use of the local data, plots were generated that appear identical to the actual ones in the ITE Trip Generation Manual.

The resulting rates and equations calculated from the local data indicate that the average weekday trip generation of apartments in this area is well above the national rates reported in the ITE manual. For example, the locally computed average rate for number of trips generated during a weekday is 35% higher than the rate given by ITE (increase from 6.63 trips per dwelling unit to 9.03 trips per dwelling unit). The trip generation rates do not increase as much for the AM and PM peak hours however. The local rate is roughly 8% higher for the AM peak, and 16% higher for the PM peak. The plots from the ITE Trip Generation Manual are included in the Technical Appendix for comparison purposes.

## ASSUMPTIONS MADE

Some important assumptions have been made which may affect the results of the local data that was collected:

- It is important to note that the local trip generation rates were computed for the *total* number of dwelling units in the apartment complex, and not necessarily for the number of *occupied* dwelling units. There are several reasons why this was done, chiefly because of the need for comparability with the rates given in ITE Trip Generation Manual, as it does not specify whether the dwelling units are occupied. According to ITE procedures the selected sites must only be of “reasonably full occupancy (i.e. at least 85%)”. The Apartment Association of Greater Knoxville (AAGK) publishes quarterly reports on occupancy levels of apartment complexes, and the report covering the period of the data collection was reviewed to determine occupancy levels. According to the AAGK report from July 1, 1996 – September 30, 1996 all of the apartment complexes surveyed in this study met the minimum 85% occupancy level, with an average occupancy rate for all sites studied of 94%.
- The count data that was collected at each apartment complex was used “raw” meaning that it was not factored for possible daily or seasonal variations. Once again, according to an ITE representative it is not known whether the data used in the Trip Generation Manual was factored or not, so therefore in order to be able to compare

local rates to those in the manual you must assume that count data should not be factored. Additionally, it was felt that apartment complexes would generally not be as susceptible to major seasonal fluctuations as other land uses might be. The local rates were also developed using count data that was collected and averaged over an entire week, which should limit some of the daily variations. Finally, reliable local daily and seasonal variation factors do not truly exist.

## CONCLUSION

The local apartment study methodology and results were distributed for comment to a group of local transportation professionals who are directly responsible for either preparing or reviewing traffic impact studies. A meeting was held between this group on February 16, 2000 in order to gather comments and discuss the study in greater detail. The following conclusions are based on the discussion and consensus reached at this meeting:

1. The trip generation rates and equations meet statistical requirements and resulted from a study that followed accepted procedures; therefore they should be adopted for future use. Furthermore, the rates and equations are recommended for use in reviewing the traffic impact of any development termed as “multi-family”, such as townhouse and condominium developments due to their similarity to apartment complexes.
2. The Traffic Access and Impact Study Guidelines and Procedures adopted by MPC should be amended with the language that local data should be used when available, which will allow the implementation of these new multi-family trip generation rates.
3. The following suggestions were made for future consideration:
  - This study should be updated with data collected from local townhouse and condominium developments in order to further justify the use of the new trip generation rates.
  - A statistical comparison should be made between any newly developed rates and the ITE single family trip generation rates to determine if there is a significant difference. If there is no difference then perhaps ITE single-family rates could be used for any residential development proposed in Knox County.



# Local Apartment Trip Generation Study

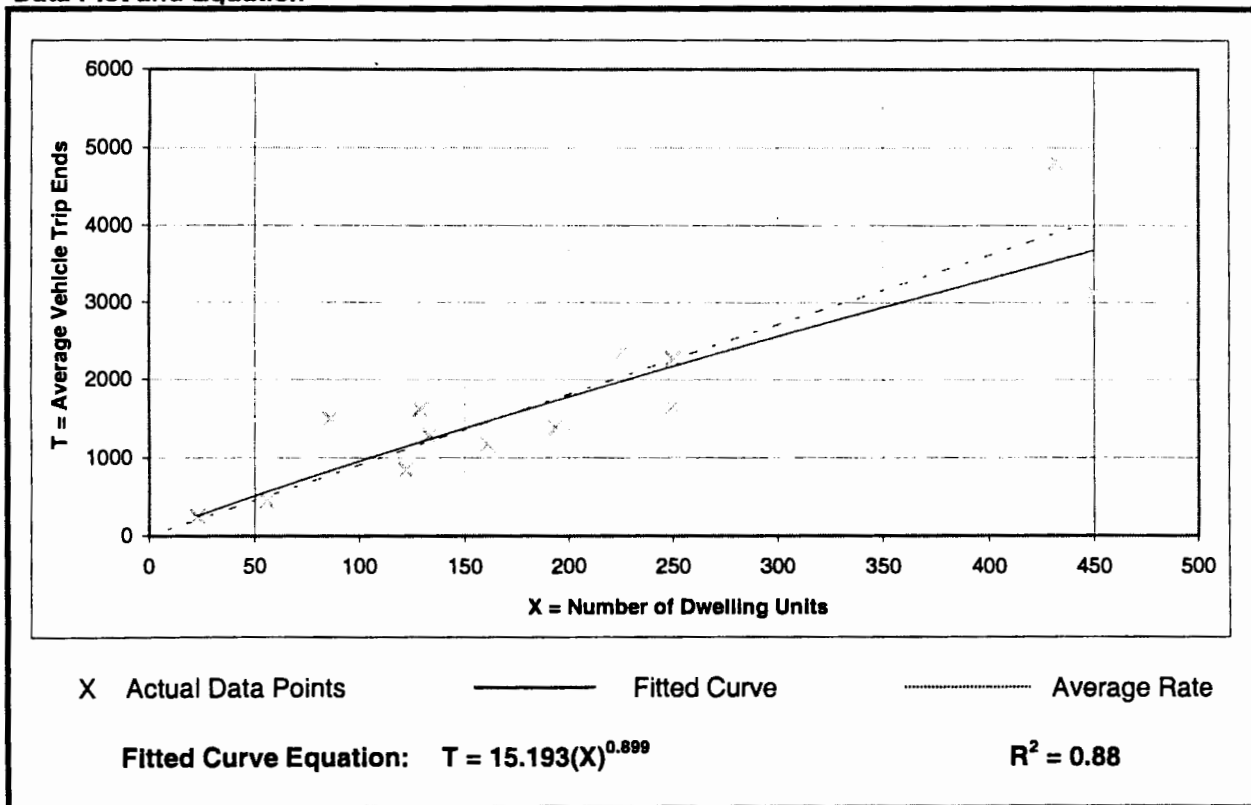
Average Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Number of Studies: 13  
Average Number of Dwelling Units: 193  
Directional Distribution: 50% entering, 50% exiting

## Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
9.03	6.59 - 17.41	2.47

## Data Plot and Equation



# Local Apartment Trip Generation Study

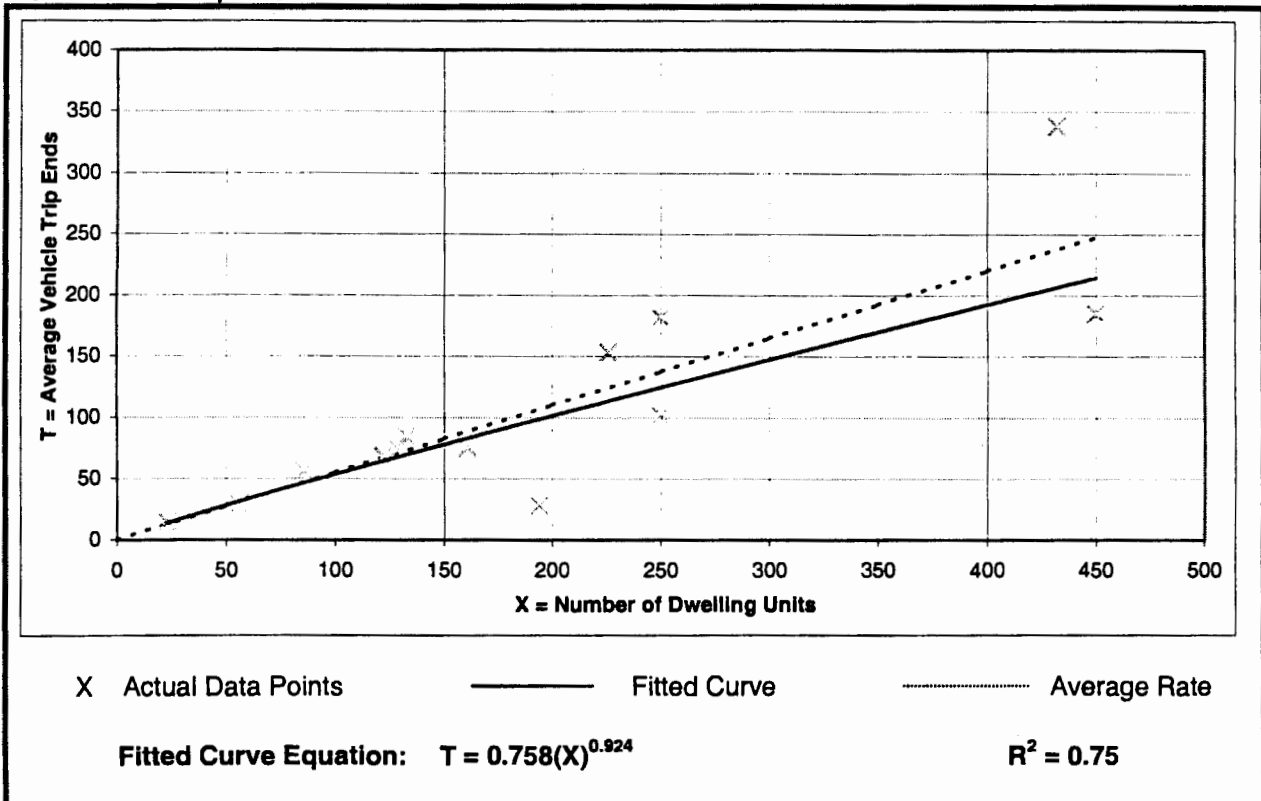
Average Vehicle Trip Ends vs: Dwelling Units  
 On a: Weekday,  
 Peak Hour of Adjacent Street Traffic,  
 One Hour Between 7 and 9 a.m.

Number of Studies: 13  
 Average Number of Dwelling Units: 193  
 Directional Distribution: 22% entering, 78% exiting

## Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.55	0.14 - 0.78	0.18

## Data Plot and Equation



# Local Apartment Trip Generation Study

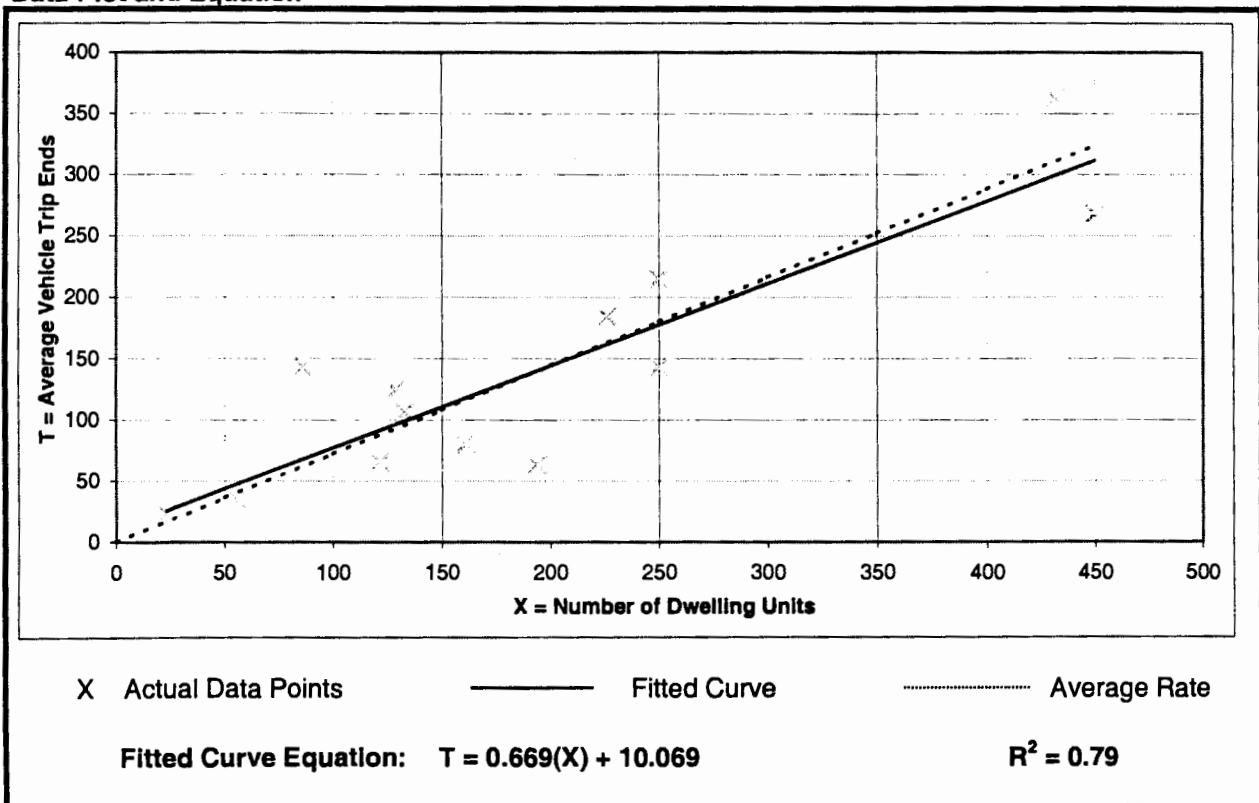
Average Vehicle Trip Ends vs: Dwelling Units  
 On a: Weekday,  
 Peak Hour of Adjacent Street Traffic,  
 One Hour Between 4 and 6 p.m.

Number of Studies: 13  
 Average Number of Dwelling Units: 193  
 Directional Distribution: 55% entering, 45% exiting

## Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.72	0.32 - 1.66	0.25

## Data Plot and Equation



**Attachment 4**  
**Unsignalized Intersection Worksheet**  
**Current AM/PM Peaks**

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/9/2012			Analysis Year	2012		
Analysis Time Period	AM Peak						
Project Description 223.005 - Current Traffic							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	20	69			136	2	
Peak-Hour Factor, PHF	0.56	0.82	1.00	1.00	0.76	0.25	
Hourly Flow Rate, HFR (veh/h)	35	84	0	0	178	8	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	5		65				
Peak-Hour Factor, PHF	0.63	1.00	0.74	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	7	0	87	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	35						94
C (m) (veh/h)	1395						842
v/c	0.03						0.11
95% queue length	0.08						0.38
Control Delay (s/veh)	7.6						9.8
LOS	A						A
Approach Delay (s/veh)	--	--					9.8
Approach LOS	--	--					A

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/9/2012			Analysis Year	2012		
Analysis Time Period	PM Peak						
Project Description 223.005 - Current Traffic							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	50	123			137	15	
Peak-Hour Factor, PHF	0.69	0.88	1.00	1.00	0.88	0.75	
Hourly Flow Rate, HFR (veh/h)	72	139	0	0	155	20	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	2		53				
Peak-Hour Factor, PHF	0.50	1.00	0.78	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	4	0	67	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	72						71
C (m) (veh/h)	1407						852
v/c	0.05						0.08
95% queue length	0.16						0.27
Control Delay (s/veh)	7.7						9.6
LOS	A						A
Approach Delay (s/veh)	--	--					9.6
Approach LOS	--	--					A

**Attachment 5**  
**Unsignalized Intersection Worksheet**  
**Future AM/PM Peaks**

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/9/2012			Analysis Year	2015		
Analysis Time Period	AM Peak						
Project Description 223.005 - Future Traffic w/o Development							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	23	81			160	2	
Peak-Hour Factor, PHF	0.56	0.82	1.00	1.00	0.76	0.25	
Hourly Flow Rate, HFR (veh/h)	41	98	0	0	210	8	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	6		76				
Peak-Hour Factor, PHF	0.63	1.00	0.74	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	9	0	102	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	41						111
C (m) (veh/h)	1358						803
v/c	0.03						0.14
95% queue length	0.09						0.48
Control Delay (s/veh)	7.7						10.2
LOS	A						B
Approach Delay (s/veh)	--	--					10.2
Approach LOS	--						B



TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/9/2012			Analysis Year	2015		
Analysis Time Period	PM Peak						
Project Description 223.005 - Future Traffic w/o Development							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	59	144			161	18	
Peak-Hour Factor, PHF	0.69	0.88	1.00	1.00	0.88	0.75	
Hourly Flow Rate, HFR (veh/h)	85	163	0	0	182	24	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	2		62				
Peak-Hour Factor, PHF	0.50	1.00	0.78	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	4	0	79	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	85						83
C (m) (veh/h)	1371						820
v/c	0.06						0.10
95% queue length	0.20						0.34
Control Delay (s/veh)	7.8						9.9
LOS	A						A
Approach Delay (s/veh)	--	--					9.9
Approach LOS	--	--					A

**Attachment 6**  
**Unsignalized Intersection Worksheet**  
**Future AM/PM Peaks + Development**

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/31/2012			Analysis Year	2015		
Analysis Time Period	AM Peak						
Project Description 223.005 - Future Traffic with Development							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	35	81			160	22	
Peak-Hour Factor, PHF	0.85	0.85	1.00	1.00	0.85	0.85	
Hourly Flow Rate, HFR (veh/h)	41	95	0	0	188	25	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	12		184				
Peak-Hour Factor, PHF	0.85	1.00	0.85	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	14	0	216	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration		LR					
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	41						230
C (m) (veh/h)	1363						824
v/c	0.03						0.28
95% queue length	0.09						1.14
Control Delay (s/veh)	7.7						11.1
LOS	A						B
Approach Delay (s/veh)	--	--					11.1
Approach LOS	--	--					B

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	ALK			Intersection	Solway/Greystone Summit		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/9/2012			Analysis Year	2015		
Analysis Time Period	PM Peak						
Project Description 223.005 - Future Traffic with Development							
East/West Street: Greystone Summit Blvd				North/South Street: Solway Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	119	144			161	72	
Peak-Hour Factor, PHF	0.90	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	132	160	0	0	178	80	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT						TR
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	7		151				
Peak-Hour Factor, PHF	0.90	1.00	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	7	0	167	0	0	0	
Percent Heavy Vehicles	1	0	1	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration		LR					
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11 12
Lane Configuration	LT						LR
v (veh/h)	132						174
C (m) (veh/h)	1313						790
v/c	0.10						0.22
95% queue length	0.33						0.84
Control Delay (s/veh)	8.0						10.8
LOS	A						B
Approach Delay (s/veh)	--	--					10.8
Approach LOS	--	--					B

**Attachment 7**  
**Unsignalized Intersection Worksheet**  
**Project Entrance - Future AM/PM Peaks + Development**

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	ALK			Intersection	Greystone Summit/Driveway			
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County			
Date Performed	5/10/2012			Analysis Year	2015			
Analysis Time Period	AM Peak							
Project Description 223.005 - The Preserve at Greystone Summit Driveway								
East/West Street: Greystone Summit Blvd				North/South Street: Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		82	0	32	25			
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00		
Hourly Flow Rate, HFR (veh/h)	0	91	0	35	27	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1		0	
Configuration			TR	LT				
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	0		114					
Peak-Hour Factor, PHF	0.90	1.00	0.90	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	0	0	126	0	0	0		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration		LR						
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		35		126				
C (m) (veh/h)		1517		972				
v/c		0.02		0.13				
95% queue length		0.07		0.44				
Control Delay (s/veh)		7.4		9.3				
LOS		A		A				
Approach Delay (s/veh)	--	--	9.3					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	ALK			Intersection	Greystone Summit/Driveway		
Agency/Co.	Fulghum, MacIndoe & Assoc.			Jurisdiction	Knox County		
Date Performed	5/10/2012			Analysis Year	2015		
Analysis Time Period	PM Peak						
Project Description 223.005 - The Preserve at Greystone Summit Driveway							
East/West Street: Greystone Summit Blvd				North/South Street: Driveway			
Intersection Orientation: East-West				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		64	0	114	77		
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00	
Hourly Flow Rate, HFR (veh/h)	0	71	0	126	85	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	0		94				
Peak-Hour Factor, PHF	0.90	1.00	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	0	104	0	0	0	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		126		104			
C (m) (veh/h)		1542		997			
v/c		0.08		0.10			
95% queue length		0.27		0.35			
Control Delay (s/veh)		7.5		9.0			
LOS		A		A			
Approach Delay (s/veh)	--	--		9.0			
Approach LOS	--	--		A			

**Attachment 8**  
**Turn Lane Warrants**



**Attachment 8**  
**Turn Lane Warrant Analysis**

**Project: The Preserve at Greystone Summit**

**Solway Road  
at Greyston Summit Blvd**

VOLUMES

		%LT	Opposing	LT	LT MAX	Warrant Met
LEFT TURN						
Proposed	AM	31%	182	35	200	NO
	PM	46%	233	119	160	NO
RIGHT TURN						
Proposed	AM	12%	116	22	449	NO
	PM	31%	263	72	299	NO

**Greystone Summit Blvd  
at Proposed Driveway**

VOLUMES

		%LT	Opposing	LT	LT MAX	Warrant Met
LEFT TURN						
Proposed	AM	56%	82	32	300	NO
	PM	60%	64	114	300	NO
RIGHT TURN						
Proposed	AM	100%	57	114	599	NO
	PM	100%	191	94	599	NO

TABLE 4A

LEFT-TURN LANE VOLUME THRESHOLDS  
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

(If the left-turn volume exceeds the table value a left -turn lane is needed)

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *							
	AM 25	100 - 149	PM 77	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
AM 82 100 - 149 PM 64 150 - 199		300 245	AM+PM	235 200	185 160	145 130	120 110	100 90
200 - 249 250 - 299		205 175		170 150	140 125	115 105	100 90	80 70
300 - 349 350 - 399		155 135		135 120	110 100	95 85	80 70	65 60
400 - 449 450 - 499		120 105		105 90	90 80	75 70	65 60	55 50
500 - 549 550 - 599		95 85		80 70	70 65	65 60	55 50	50 45
600 - 649 650 - 699		75 70		65 60	60 55	55 50	45 40	40 35
700 - 749 750 or More		65 60		55 50	50 45	45 40	35 35	30 30

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149 150 - 199	100 90	80 75	70 65	60 55	55 50	50 45
200 - 249 250 - 299	80 70	72 65	460 55	55 50	50 45	45 40
300 - 349 350 - 399	65 60	60 55	50 50	50 45	45 40	40 40
400 - 449 450 - 499	55 50	50 45	45 45	45 40	40 35	35 35
500 - 549 550 - 599	50 45	45 40	40 40	40 35	35 35	35 35
600 - 649 650 - 699	40 35	35 35	35 35	35 30	35 30	30 30
700 - 749 750 or More	30 30	30 30	30 30	30 30	30 30	30 30

\* Or through volume only if a right-turn lane exists.

TABLE 4B  
RIGHT-TURN LANE VOLUME THRESHOLDS  
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	Am 0 < 100 Pm 0	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99 <b>94</b>						
100 - 149 <b>114</b> 150 - 199	<b>PM Peak</b> <b>AM Peak</b>					
200 - 249 250 - 299						Yes
300 - 349 350 - 399				Yes	Yes Yes	Yes Yes
400 - 449 450 - 499			Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

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
100 - 149 150 - 199			Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	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

\* Or through volume only if a left-turn lane exists.

TABLE 5A

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

(If the left-turn volume exceeds the table value a left -turn lane is needed)

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *						
	Am 81	100 - 149 Pm 144	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
100 - 149		250	180	140	110	80	70
150 - 199	182	(200)-Am	140	105	90	70	60
200 - 249	233	(160)-Pm	115	85	75	65	55
250 - 299		130	100	75	65	60	50
300 - 349		110	90	70	60	55	45
350 - 399		100	80	65	55	50	40
400 - 449		90	70	60	50	45	35
450 - 499		80	65	55	45	40	30
500 - 549		70	60	45	35	35	25
550 - 599		65	55	40	35	30	25
600 - 649		60	45	35	30	25	25
650 - 699		55	35	35	30	25	20
700 - 749		50	35	30	25	20	20
750 or More		45	35	25	25	20	20

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149	70	60	50	45	40	35
150 - 199	60	55	45	40	35	30
200 - 249	55	50	40	35	30	30
250 - 299	50	45	35	30	30	30
300 - 349	45	40	35	30	25	25
350 - 399	40	35	30	25	25	20
400 - 449	35	30	30	25	20	20
450 - 499	30	25	25	20	20	20
500 - 549	25	25	20	20	20	15
550 - 599	25	20	20	20	20	15
600 - 649	25	20	20	20	20	15
650 - 699	20	20	20	20	20	15
700 - 749	20	20	20	15	15	15
750 or More	20	20	20	15	15	15

\* Or through volume only if a right-turn lane exists

TABLE 5B

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	Am 160	100 - 199	Pm 161	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 <b>22</b> 25 - 49 50 - 99 <b>72</b>		Am Peak						
		Pm Peak						
100 - 149 150 - 199								
200 - 249 250 - 299							Yes	Yes
300 - 349 350 - 399					Yes	Yes	Yes	Yes
400 - 449 450 - 499			Yes		Yes	Yes	Yes	Yes
500 - 549 550 - 599	Yes		Yes		Yes	Yes	Yes	Yes
600 or More	Yes		Yes		Yes	Yes	Yes	Yes

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
100 - 149 150 - 199		Yes	Yes	Yes	Yes	Yes
200 - 249 250 - 299	Yes	Yes	Yes	Yes	Yes	Yes
300 - 349 350 - 399	Yes	Yes	Yes	Yes	Yes	Yes
400 - 449 450 - 499	Yes	Yes	Yes	Yes	Yes	Yes
500 - 549 550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

\* Or through volume only if a left-turn lane exists.