

**Bluffton Parkway at
Buckwalter Place Boulevard**
Traffic Signal Warrant Analysis

Bluffton, South Carolina

Prepared for

HL Development, LLC

Prepared by

Kimley»Horn

December 2023

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A handwritten signature in dark ink, appearing to read "Dillon Brent Turner".

December 7, 2023

December 2023

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Table of Contents

1 Introduction.....	1
2 Existing Conditions	2
3 Future-Year Traffic Volume Development.....	2
4 Traffic Signal Warrant Analysis.....	4
5 Conclusion.....	6

List of Figures

Figure 1 – Site Location	1
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List of Tables

Table 1 – Parcel 12-C Trip Generation Summary.....	3
Table 2 – The Palmer Trip Generation Summary	3
Table 3 – The Elle Apartments Trip Generation Summary	4
Table 4 – Townhome Trip Generation Summary	4
Table 5 – Traffic Signal Warrant Analysis Results.....	5

List of Appendices

- A – Turning Movement Count Data
- B – Volume Development Calculations
- C – Traffic Signal Warrant Analysis Worksheets

1 Introduction

The purpose of this report is to document a traffic signal warrant analysis conducted for the future intersection of Bluffton Parkway with Buckwalter Place Boulevard in Bluffton, SC. The subject intersection is located approximately 0.75 miles to the west of Buckwalter Parkway along Bluffton Parkway. The southbound approach (Buckwalter Place Boulevard) is currently under construction and will provide access to residential land uses. The northbound approach, which has yet to be constructed, is planned to provide access to residential and commercial land uses. The approved developments that would utilize the not yet constructed northbound approach are anticipated to be built and operational by 2030. Therefore, the year 2030 was analyzed for this traffic signal warrant analysis. The study intersection location is shown in **Figure 1**.

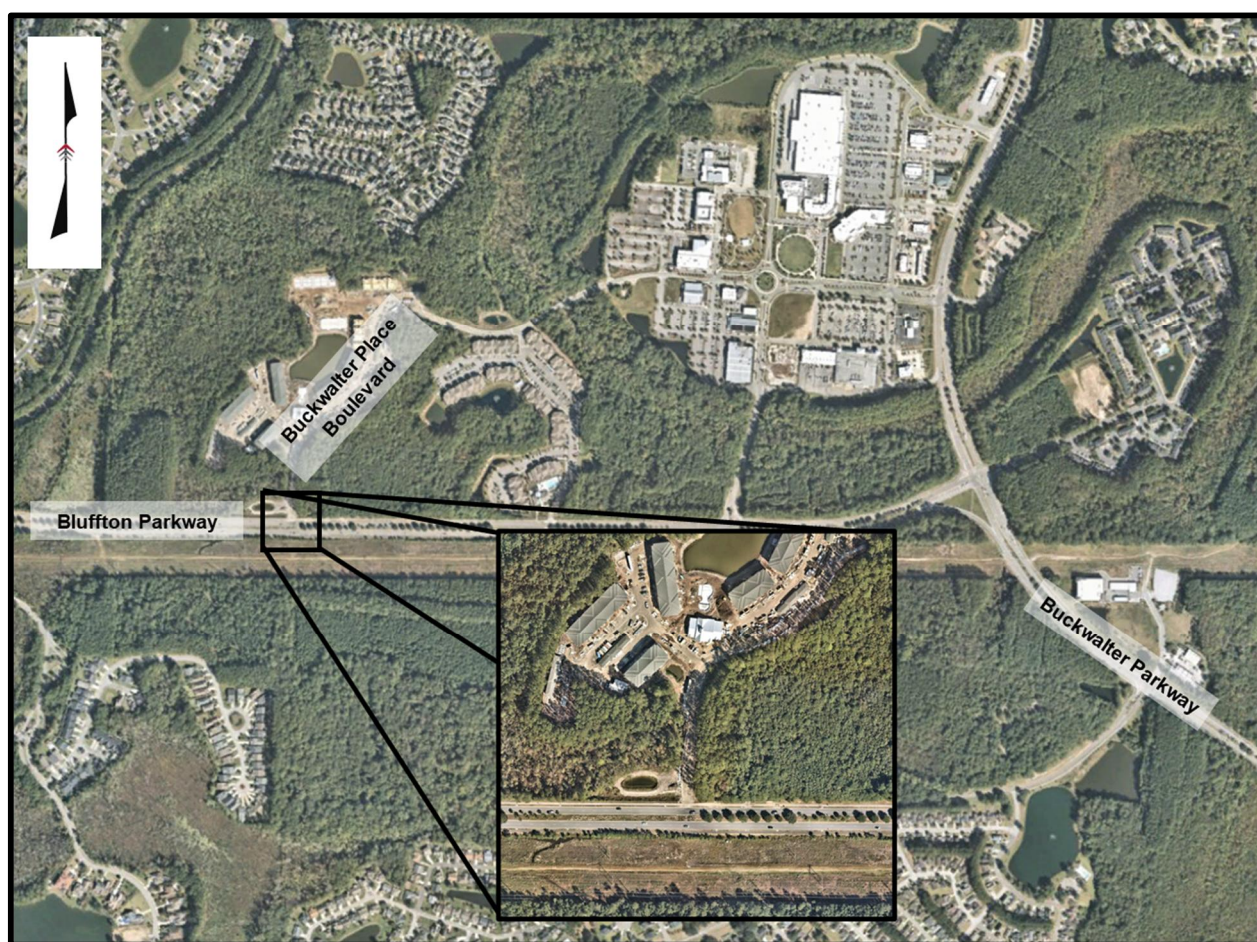


Figure 1 – Site Location

2 Existing Conditions

Bluffton Parkway is a four-lane, divided minor arterial roadway that carried 16,600 vehicles per day in 2022 based on data from SCDOT count station 07-0554. Data from SCDOT indicates that traffic volumes on Bluffton Parkway have grown at a rate of approximately 7.3% and 4.0% per year over the most recent five- and 10-year periods, respectively.

Data Collection

Turning movement counts were collected for 13 hours (6:00 AM – 7:00 PM) at the intersection of Bluffton Parkway at Inspiration Avenue, located approximately 1,500 feet to the east of the subject intersection on Tuesday, November 7, 2023. The traffic volumes were balanced to reflect the existing through volumes at the location of the subject intersection. The raw turning movement count data is provided in **Appendix A**.

3 Future-Year Traffic Volume Development

Background Growth

Historical traffic growth represents the increase in existing traffic volumes due to usage increases and non-specific growth throughout the area (i.e., that not associated with the subject development). An annual growth rate of 2.0% was established to capture the expected increase in traffic volume associated with the surrounding developments over the next 7 years.

The 2030 traffic volumes, not including approved developments, were estimated by increasing the raw turning movement count data at a rate of 2.0% for seven years.

Approved Developments

The traffic signal warrant analysis considered multiple approved developments that are anticipated to be built and operational by 2030 that will utilize the subject intersection. To estimate the trip generation for the approved developments, the *Institute of Transportation Engineers' (ITE) Trip Generation Manual; 11th Edition* was used. Each approved development and assumed land use codes (LUCs) are as follows:

Parcel 12-C:

Parcel 12-C is located just south of the subject intersection and is planned to have two access points located along Bluffton Parkway, one of them serving as the future northbound leg to the subject intersection. It was assumed 50% of the total traffic will utilize the subject intersection. This development is comprised of the following:

- 132.7 thousand square feet (KSF) of building space. For the purposes of this analysis, it was assumed:
 - LUC 821 – Shopping Plaza – 99.5 KSF (75% of total)
 - LUC 932 – High-Turnover (Sit-Down) Restaurant – 33.2 KSF (25% of total)
- LUC 310 – Hotel – 100 Rooms

- LUC 850 – Supermarket – 15.6 KSF

Table 1 below summarizes the estimated trip generation of Parcel 12-C.

Table 1 – Parcel 12-C Trip Generation Summary

Land Use	Intensity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Retail Land Uses			8,557	217	133	84	688	339	349
821 - Shopping Plaza (40-150k) – No Supermarket	99.5	KSF	6,717	172	107	65	516	253	263
850 - Supermarket	15.6	KSF	1,840	45	26	19	172	86	86
Restaurant Land Uses			3,555	317	174	143	300	183	117
932 - High-Turnover (Sit-Down) Restaurant	33.2	KSF	3,555	317	174	143	300	183	117
Hotel Land Uses			660	43	24	19	46	24	22
310 - Hotel	100	ROOM	660	43	24	19	46	24	22
Subtotal			12,772	577	331	246	1,034	546	488
Internal Capture			2,554	56	28	28	208	104	104
Pass-By			1,660	0	0	0	206	103	103
Total Net New External Trips			8,558	521	303	218	620	339	281

The Palmer:

The Palmer is located to the southwest of the subject intersection with two access points to Bluffton Parkway, one of them utilizing the future northbound leg to the intersection. It was assumed 50% of the total traffic will utilize the subject intersection. This development is comprised of:

- LUC 220 – Multifamily Housing (Low-Rise) – 200 Dwelling Units (DUs)

Table 2 below summarizes the estimated trip generation for The Palmer development.

Table 2 – The Palmer Trip Generation Summary

Land Use	Intensity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
220 - Multifamily Housing (Low-Rise)	200	DU	1,357	85	20	65	107	67	40
Total Net New External Trips			1,357	85	20	65	107	67	40

The Elle Apartments:

The Elle Apartments is planned to be located north of the subject intersection with access located along Buckwalter Place Boulevard. It was assumed 25% of the total traffic will utilize the subject intersection. The development is planned to consist of the following:

- LUC 221 – Multifamily Housing (Mid-Rise) – 252 DUs

Table 3 below summarizes the estimated trip generation of The Elle Apartments.

Table 3 – The Elle Apartments Trip Generation Summary

Land Use	Intensity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
221 - Multifamily Housing (Mid-Rise)	252	DU	1,156	99	23	76	99	60	39
Total Net New External Trips			1,156	99	23	76	99	60	39

Townhome Units:

There are townhome units planned to be located south of the Parcel 12-C development that will utilize the future northern leg to access Bluffton Parkway. The development is planned to consist of the following:

- LUC 215 – Single-Family Attached Housing – 53 DUs

Table 4 below summarizes the estimated trip generation for the development.

Table 4 – Townhome Trip Generation Summary

Land Use	Intensity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
215 – Single-Family Attached Housing	53	DU	353	22	7	15	28	16	12
Total Net New External Trips			353	22	7	15	28	16	12

The 2030 traffic volumes used for the traffic signal warrant analysis were generated by taking the projected daily traffic volumes from for each land use and using the vehicle time of day distributions as set forth by the ITE Trip Generation Manual.

The volume development calculations presenting the generated volumes of each development are provided in **Appendix B**.

4 Traffic Signal Warrant Analysis

A traffic signal warrant analysis was conducted for the intersection of Bluffton Parkway at Buckwalter Place Boulevard in accordance with Part 4 of the *Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD provides a total of nine traffic signal warrants; however, only Warrant 1 (Eight-Hour Vehicular Volume) was considered in evaluating conditions at the study intersection.

For the purposes of this analysis, the following assumption was considered:

- The posted speed limit on Bluffton Parkway exceeds 40 mph; therefore, the 70% reduction factors offered by the MUTCD were considered as part of the analysis.

Warrant 1 – Eight-Hour Vehicular Volume

Warrant 1 is described by the MUTCD as follows:

“The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.”

“The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.”

The minimum hourly volumes needed to satisfy the criteria of Warrant 1, Condition A are 420 vehicles per hour (vph) on the major street approaches and 105 vph on the highest minor street approach (for a one-lane approach) for each of any eight hours on an average day.

The minimum hourly volumes needed to satisfy the criteria of Warrant 1, Condition B are 630 vph on the major street approaches and 53 vph on the highest minor street approach (for a one-lane approach) for each of any eight hours on an average day.

Signal Warrant Analysis Summary

Signal Warrant Analysis results are presented in **Table 5**, and full analysis worksheets with hourly volume development tables are included in **Appendix C**. The analysis results presented in **Table 5** and **Appendix C** indicate that the applicable criteria are met for MUTCD Warrant 1A and Warrant 1B based on the projected traffic volumes for 2030. This includes a 50% and 100% right-turn reduction for the higher minor street volume.

Table 5 – Traffic Signal Warrant Analysis Results

MUTCD Traffic Signal Warrant	Warrant Analysis Results		
	No Right-Turn Reduction	50% Right-Turn Reduction	100% Right-Turn Reduction
Warrant 1, Condition A	Satisfied (12/8)	Satisfied (8/8)	Not Satisfied (0/8)
Warrant 1, Condition B	Satisfied (12/8)	Satisfied (12/8)	Satisfied (9/8)

5 Conclusion

A traffic signal warrant analysis was conducted for the future intersection of Bluffton Parkway at Buckwalter Place Boulevard. The analyses was conducted in accordance with the guidelines published in the *Manual on Uniform Traffic Control Devices* (MUTCD), Part 4.

The signal warrant analysis results indicate that the applicable criteria are met for MUTCD Warrant 1A and Warrant 1B, based on projected 2030 projected turning movement volumes at the intersection of Bluffton Parkway at Buckwalter Place Boulevard. Therefore, upon the build out of the previously mentioned approved developments, a traffic signal is anticipated to be warranted. A full traffic signal warrant analysis should be conducted once the sites are operational to confirm the actual volumes meet the necessary 8-hour MUTCD warrants to implement a signal at Bluffton Parkway and Buckwalter Place Boulevard.

Appendix A – Turning Movement Count Data



(303) 216-2439
www.alltrafficdata.net

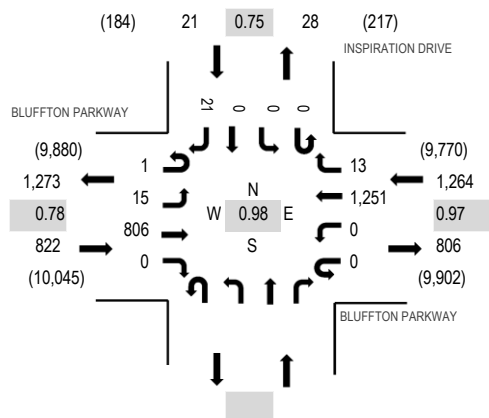
Location: 3 INSPIRATION DRIVE & BLUFFTON PARKWAY AM

Date: Tuesday, November 7, 2023

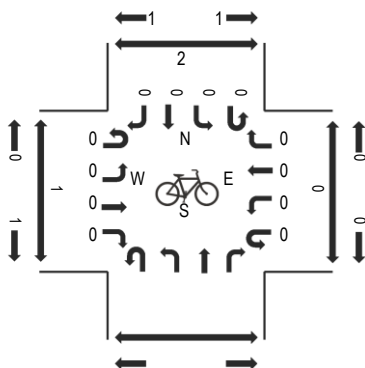
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

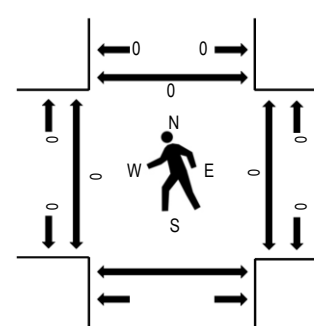
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BLUFFTON PARKWAY Eastbound				BLUFFTON PARKWAY Westbound				INSPIRATION DRIVE Northbound				INSPIRATION DRIVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:00 AM	0	1	47	0	0	0	30	0					0	0	0	1	79	498	0	0		0
6:15 AM	0	6	57	0	0	0	37	0					0	1	0	1	102	637	0	0		0
6:30 AM	0	3	89	0	0	0	42	0					0	1	0	7	142	858	1	1		1
6:45 AM	0	3	121	0	0	0	46	1					0	0	0	4	175	1,143	0	0		0
7:00 AM	0	3	160	0	0	0	48	0					0	0	0	7	218	1,401	0	0		0
7:15 AM	1	1	249	0	0	0	68	0					0	1	0	3	323	1,507	0	0		0
7:30 AM	0	8	335	0	0	0	80	3					0	0	0	1	427	1,528	0	0		0
7:45 AM	0	0	279	0	0	0	151	0					0	0	0	3	433	1,446	0	0		0
8:00 AM	0	3	195	0	0	0	124	0					0	0	0	2	324	1,381	0	0		0
8:15 AM	0	1	216	0	0	0	122	0					0	0	0	5	344	1,402	0	0		0
8:30 AM	0	3	211	0	0	0	125	2					0	0	0	4	345	1,384	1	0		1
8:45 AM	0	5	242	0	0	0	117	1					0	0	0	3	368	1,379	0	0		0
9:00 AM	0	3	219	0	0	0	119	1					0	1	0	2	345	1,370	0	0		0
9:15 AM	0	1	191	0	0	0	130	0					0	0	0	4	326	1,378	0	0		0
9:30 AM	0	1	207	0	0	0	129	0					0	0	0	3	340	1,419	0	0		0
9:45 AM	0	5	217	0	0	0	136	0					0	0	0	1	359	1,440	0	0		0
10:00 AM	0	2	217	0	0	0	127	1					0	0	0	6	353	1,457	0	0		0
10:15 AM	0	2	217	0	0	0	144	2					0	0	0	2	367	1,460	0	0		0
10:30 AM	0	2	189	0	0	0	163	3					0	0	0	4	361	1,501	0	0		0
10:45 AM	0	1	219	0	0	0	154	1					0	1	0	0	376	1,569	0	0		0
11:00 AM	0	1	193	0	0	0	158	1					0	0	0	3	356	1,669	0	0		1
11:15 AM	0	1	219	0	0	0	184	0					0	0	0	4	408	1,780	0	0		2
11:30 AM	0	1	238	0	0	0	187	1					0	0	0	2	429	1,820	0	0		1
11:45 AM	0	2	250	0	0	0	219	2					0	0	0	3	476	1,792	0	0		0
12:00 PM	1	4	201	0	0	0	259	0					0	0	0	2	467	1,754	0	0		0
12:15 PM	0	1	198	0	0	0	240	3					0	0	0	6	448	1,704	0	0		0
12:30 PM	1	0	200	0	0	0	195	2					0	1	0	2	401	1,669	0	0		0
12:45 PM	0	4	200	0	0	0	229	1					0	0	0	4	438	1,648	0	0		0
1:00 PM	0	4	178	0	0	0	229	1					0	0	0	5	417	1,596	0	0		0
1:15 PM	1	2	192	0	0	0	216	1					0	0	0	1	413	1,551	0	0		0
1:30 PM	0	1	171	0	0	0	204	1					0	0	0	3	380	1,531	0	0		1
1:45 PM	0	2	178	0	0	0	203	1					0	0	0	2	386	1,562	0	0		0
2:00 PM	0	1	143	0	0	0	225	1					0	0	0	2	372	1,614	0	0		0
2:15 PM	0	2	193	0	0	0	192	1					0	0	0	5	393	1,712	0	0		0

Appendix B – Volume Development Calculations

Parcel 12-C Daily Volumes						
Land Use			Volume			
			Daily	Internal Capture	Pass-By	New
Retail	Shopping Plaza	821	6,717	1343	801	4,573
	Supermarket	850	1,840	368	501	971
	Restaurant	932	3,555	711	358	2,486
	Hotel	310	660	132	0	528
Total			12,772	2,554	1,660	8,558

Parcel 12-C Daily Distributions

Land Use Code	310			821			850			932		
Land Use	Hotel			Shopping Plaza (40-150k)			Supermarket			High-Turnover (Sit-Down) Restaurant		
Setting	General Urban/Suburban			General Urban/Suburban			General Urban/Suburban			General Urban/Suburban		
Time Period	Weekday			Weekday			Weekday			Weekday		
# Data Sites	1			6			3			37		
Time	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
6:00 - 7:00 AM	0.015	0.008	0.022	0.008	-	-	0.003	0.006	0.000	0.013	0.017	0.009
7:00 - 8:00 AM	0.053	0.024	0.082	0.018	-	-	0.015	0.015	0.014	0.023	0.027	0.018
8:00 - 9:00 AM	0.048	0.033	0.063	0.033	-	-	0.038	0.043	0.033	0.032	0.034	0.031
9:00 - 10:00 AM	0.058	0.048	0.067	0.051	-	-	0.047	0.051	0.044	0.037	0.040	0.034
10:00 - 11:00 AM	0.069	0.059	0.078	0.065	-	-	0.059	0.064	0.054	0.049	0.055	0.044
11:00 - 12:00 PM	0.078	0.074	0.081	0.074	-	-	0.074	0.074	0.073	0.095	0.121	0.069
12:00 - 1:00 PM	0.083	0.103	0.062	0.086	-	-	0.096	0.093	0.099	0.123	0.124	0.123
1:00 - 2:00 PM	0.090	0.107	0.072	0.083	-	-	0.081	0.087	0.075	0.088	0.065	0.112
2:00 - 3:00 PM	0.079	0.078	0.080	0.072	-	-	0.090	0.088	0.092	0.045	0.040	0.051
3:00 - 4:00 PM	0.076	0.082	0.070	0.072	-	-	0.087	0.089	0.085	0.036	0.033	0.040
4:00 - 5:00 PM	0.073	0.071	0.076	0.073	-	-	0.097	0.098	0.097	0.051	0.062	0.039
5:00 - 6:00 PM	0.077	0.088	0.065	0.080	-	-	0.095	0.095	0.095	0.085	0.102	0.068
6:00 - 7:00 PM	0.051	0.054	0.048	0.085	-	-	0.085	0.078	0.093	0.094	0.101	0.087

	528	264	264	4,573	2287	2,286	971	486	485		2,486	1243	1,243
Time	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	
6:00 - 7:00 AM	8	2	6	36	18	18	3	3	0	33	22	11	
7:00 - 8:00 AM	28	6	22	80	40	40	14	7	7	57	34	23	
8:00 - 9:00 AM	25	9	17	149	75	74	37	21	16	80	42	38	
9:00 - 10:00 AM	30	13	18	233	117	116	46	25	22	92	50	42	
10:00 - 11:00 AM	36	16	21	298	149	149	57	31	26	123	68	55	
11:00 - 12:00 PM	41	19	22	340	170	170	72	36	35	237	151	86	
12:00 - 1:00 PM	44	27	16	392	196	196	93	45	48	307	154	153	
1:00 - 2:00 PM	47	28	19	379	190	189	78	42	36	219	80	139	
2:00 - 3:00 PM	42	21	21	330	165	165	87	43	44	113	50	63	
3:00 - 4:00 PM	40	22	18	330	165	165	84	43	41	90	41	49	
4:00 - 5:00 PM	39	19	20	332	166	166	94	48	47	126	77	49	
5:00 - 6:00 PM	41	23	17	364	182	182	92	46	46	211	126	85	
6:00 - 7:00 PM	27	14	13	390	195	195	83	38	45	233	126	108	

<i>Total</i>			
Time	Total	Entering	Exiting
6:00 - 7:00 AM	80	45	35
7:00 - 8:00 AM	179	87	92
8:00 - 9:00 AM	291	147	145
9:00 - 10:00 AM	401	205	198
10:00 - 11:00 AM	514	264	251
11:00 - 12:00 PM	690	376	313
12:00 - 1:00 PM	836	422	413
1:00 - 2:00 PM	723	340	383
2:00 - 3:00 PM	572	279	293
3:00 - 4:00 PM	544	271	273
4:00 - 5:00 PM	591	310	282
5:00 - 6:00 PM	708	377	330
6:00 - 7:00 PM	733	373	361

Time	Parcel 12-C Volumes to Site														Total		
	BLUFFTON PARKWAY				BLUFFTON PARKWAY								Buckwalter Place Boulevard				
	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left		Thru	Right
6:00 AM				8		15				6		12					41
7:00 AM				15		29				16		30					90
8:00 AM				26		48				26		47					147
9:00 AM				36		67				35		65					203
10:00 AM				46		86				44		82					258
11:00 AM				66		122				55		102					345
12:00 PM				74		137				73		134					418
1:00 PM				60		111				67		125					363
2:00 PM				49		91				52		95					287
3:00 PM				48		88				48		89					273
4:00 PM				55		101				50		92					298
5:00 PM				66		123				58		108					355
6:00 PM				66		121				63		118					368

To/From: East West
 65% 35%

% to study intersection: 50%

The Elle Apartments

Land Use Code	221		
Land Use	Multifamily Housing (Mid-Rise)		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	6		
Time	Total	Entering	Exiting
6:00 - 7:00 AM	0.044	0.010	0.078
7:00 - 8:00 AM	0.086	0.025	0.147
8:00 - 9:00 AM	0.078	0.030	0.125
9:00 - 10:00 AM	0.045	0.022	0.069
10:00 - 11:00 AM	0.037	0.027	0.046
11:00 - 12:00 PM	0.037	0.034	0.040
12:00 - 1:00 PM	0.046	0.043	0.048
1:00 - 2:00 PM	0.044	0.044	0.044
2:00 - 3:00 PM	0.039	0.041	0.037
3:00 - 4:00 PM	0.049	0.059	0.038
4:00 - 5:00 PM	0.072	0.092	0.051
5:00 - 6:00 PM	0.094	0.131	0.058
6:00 - 7:00 PM	0.090	0.121	0.060

1,156 578 578

Time	Total	Entering	Exiting
6:00 - 7:00 AM	51	6	45
7:00 - 8:00 AM	99	14	85
8:00 - 9:00 AM	90	17	72
9:00 - 10:00 AM	52	13	40
10:00 - 11:00 AM	42	16	26
11:00 - 12:00 PM	42	20	23
12:00 - 1:00 PM	53	25	28
1:00 - 2:00 PM	51	25	25
2:00 - 3:00 PM	45	24	21
3:00 - 4:00 PM	56	34	22
4:00 - 5:00 PM	83	53	30
5:00 - 6:00 PM	109	76	33
6:00 - 7:00 PM	104	70	35

<i>Total</i>			
Time	Total	Entering	Exiting
6:00 - 7:00 AM	51	6	45
7:00 - 8:00 AM	99	14	85
8:00 - 9:00 AM	90	17	72
9:00 - 10:00 AM	52	13	40
10:00 - 11:00 AM	42	16	26
11:00 - 12:00 PM	42	20	23
12:00 - 1:00 PM	53	25	28
1:00 - 2:00 PM	51	25	25
2:00 - 3:00 PM	45	24	21
3:00 - 4:00 PM	56	34	22
4:00 - 5:00 PM	83	53	30
5:00 - 6:00 PM	109	76	33
6:00 - 7:00 PM	104	70	35

Time	The Elle Apartments																Total	
	BLUFFTON PARKWAY				BLUFFTON PARKWAY								Buckwalter Place Boulevard					
	Eastbound				Westbound				Northbound				Southbound					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
6:00 AM		1							1					7			4	13
7:00 AM		1							2					14			8	25
8:00 AM		2							3					12			6	23
9:00 AM		1							2					7			4	14
10:00 AM		2							3					4			2	11
11:00 AM		2							3					4			2	11
12:00 PM		2							4					5			3	14
1:00 PM		2							4					4			2	12
2:00 PM		2							4					4			2	12
3:00 PM		3							6					4			2	15
4:00 PM		5							9					5			3	22
5:00 PM		7							12					5			3	27
6:00 PM		6							12					6			3	27

To/From: East West
 65% 35%

% to study intersection: 25%

Southern Townhomes Daily Distribution

Land Use Code	215		
Land Use	Single-Family Attached Housing		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	7		
Time	Total	Entering	Exiting
6:00 - 7:00 AM	0.035	0.011	0.058
7:00 - 8:00 AM	0.079	0.027	0.132
8:00 - 9:00 AM	0.066	0.038	0.093
9:00 - 10:00 AM	0.053	0.037	0.069
10:00 - 11:00 AM	0.041	0.040	0.043
11:00 - 12:00 PM	0.053	0.048	0.057
12:00 - 1:00 PM	0.052	0.054	0.051
1:00 - 2:00 PM	0.047	0.045	0.048
2:00 - 3:00 PM	0.058	0.055	0.060
3:00 - 4:00 PM	0.065	0.082	0.048
4:00 - 5:00 PM	0.075	0.098	0.051
5:00 - 6:00 PM	0.094	0.121	0.068
6:00 - 7:00 PM	0.082	0.098	0.066

353 177 176

Time	Total	Entering	Exiting
6:00 - 7:00 AM	12	2	10
7:00 - 8:00 AM	28	5	23
8:00 - 9:00 AM	23	7	16
9:00 - 10:00 AM	19	7	12
10:00 - 11:00 AM	15	7	8
11:00 - 12:00 PM	19	9	10
12:00 - 1:00 PM	19	10	9
1:00 - 2:00 PM	16	8	8
2:00 - 3:00 PM	20	10	11
3:00 - 4:00 PM	23	14	8
4:00 - 5:00 PM	26	17	9
5:00 - 6:00 PM	33	21	12
6:00 - 7:00 PM	29	17	12

<i>Total</i>			
Time	Total	Entering	Exiting
6:00 - 7:00 AM	12	2	10
7:00 - 8:00 AM	28	5	23
8:00 - 9:00 AM	23	7	16
9:00 - 10:00 AM	19	7	12
10:00 - 11:00 AM	15	7	8
11:00 - 12:00 PM	19	9	10
12:00 - 1:00 PM	19	10	9
1:00 - 2:00 PM	16	8	8
2:00 - 3:00 PM	20	10	11
3:00 - 4:00 PM	23	14	8
4:00 - 5:00 PM	26	17	9
5:00 - 6:00 PM	33	21	12
6:00 - 7:00 PM	29	17	12

Time	Southern Townhome Hourly Volumes																Total
	BLUFFTON PARKWAY				BLUFFTON PARKWAY								Buckwalter Place Boulevard				
	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
6:00 AM				1		1				4		7					13
7:00 AM				2		3				8		15					28
8:00 AM				2		5				6		10					23
9:00 AM				2		5				4		8					19
10:00 AM				2		5				3		5					15
11:00 AM				3		6				4		7					20
12:00 PM				4		7				3		6					20
1:00 PM				3		5				3		5					16
2:00 PM				4		7				4		7					22
3:00 PM				5		9				3		5					22
4:00 PM				6		11				3		6					26
5:00 PM				7		14				4		8					33
6:00 PM				6		11				4		8					29

To/From: East West
 65% 35%

% to study intersection: 100%

The Palmer Volumes

Land Use Code	220		
Land Use	Multifamily Housing (Low-Rise)		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	6		
Time	Total	Entering	Exiting
6:00 - 7:00 AM	0.042	0.014	0.069
7:00 - 8:00 AM	0.065	0.020	0.108
8:00 - 9:00 AM	0.058	0.031	0.085
9:00 - 10:00 AM	0.039	0.029	0.049
10:00 - 11:00 AM	0.036	0.024	0.048
11:00 - 12:00 PM	0.043	0.038	0.047
12:00 - 1:00 PM	0.043	0.045	0.041
1:00 - 2:00 PM	0.042	0.040	0.044
2:00 - 3:00 PM	0.052	0.056	0.049
3:00 - 4:00 PM	0.061	0.069	0.053
4:00 - 5:00 PM	0.079	0.101	0.056
5:00 - 6:00 PM	0.095	0.114	0.076
6:00 - 7:00 PM	0.082	0.097	0.067

1,357 679 678

Time	Total	Entering	Exiting
6:00 - 7:00 AM	56	9	47
7:00 - 8:00 AM	88	14	73
8:00 - 9:00 AM	79	21	57
9:00 - 10:00 AM	53	19	33
10:00 - 11:00 AM	49	16	32
11:00 - 12:00 PM	58	26	32
12:00 - 1:00 PM	59	31	28
1:00 - 2:00 PM	57	27	30
2:00 - 3:00 PM	71	38	33
3:00 - 4:00 PM	83	47	36
4:00 - 5:00 PM	107	69	38
5:00 - 6:00 PM	128	77	51
6:00 - 7:00 PM	111	66	45

<i>Total</i>			
Time	Total	Entering	Exiting
6:00 - 7:00 AM	56	9	47
7:00 - 8:00 AM	88	14	73
8:00 - 9:00 AM	79	21	57
9:00 - 10:00 AM	53	19	33
10:00 - 11:00 AM	49	16	32
11:00 - 12:00 PM	58	26	32
12:00 - 1:00 PM	59	31	28
1:00 - 2:00 PM	57	27	30
2:00 - 3:00 PM	71	38	33
3:00 - 4:00 PM	83	47	36
4:00 - 5:00 PM	107	69	38
5:00 - 6:00 PM	128	77	51
6:00 - 7:00 PM	111	66	45

	The Palmer Volumes to Intersection																
Time	BLUFFTON PARKWAY				BLUFFTON PARKWAY								Buckwalter Place Boulevard				Total
	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
6:00 AM				2		3				8		16					29
7:00 AM				3		5				13		24					45
8:00 AM				4		7				10		19					40
9:00 AM				4		6				6		11					27
10:00 AM				3		5				6		11					25
11:00 AM				5		9				6		11					31
12:00 PM				6		10				5		9					30
1:00 PM				5		9				6		10					30
2:00 PM				7		13				6		11					37
3:00 PM				8		16				7		12					43
4:00 PM				12		23				7		13					55
5:00 PM				14		25				9		17					65
6:00 PM				12		22				8		15					57

To/From: East West
 65% 35%

% to study intersection: 50%

2030 Volumes																	Total
Time	BLUFFTON PARKWAY				BLUFFTON PARKWAY								INSPIRATION DRIVE				
	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
6:00 AM	0	0	376	0	0	0	193	0	0	0	0	0	0	0	0	0	569
7:00 AM	0	0	1,190	0	0	0	416	0	0	0	0	0	0	0	0	0	1,606
8:00 AM	0	0	1,006	0	0	0	577	0	0	0	0	0	0	0	0	0	1,583
9:00 AM	0	0	969	0	0	0	602	0	0	0	0	0	0	0	0	0	1,571
10:00 AM	0	0	975	0	0	0	689	0	0	0	0	0	0	0	0	0	1,664
11:00 AM	0	0	1,040	0	0	0	873	0	0	0	0	0	0	0	0	0	1,913
12:00 PM	0	0	930	0	0	0	1,079	0	0	0	0	0	0	0	0	0	2,009
1:00 PM	0	0	837	0	0	0	992	0	0	0	0	0	0	0	0	0	1,829
2:00 PM	0	0	837	0	0	0	1,011	0	0	0	0	0	0	0	0	0	1,848
3:00 PM	0	0	843	0	0	0	1,267	0	0	0	0	0	0	0	0	0	2,110
4:00 PM	0	0	980	0	0	0	1,212	0	0	0	0	0	0	0	0	0	2,192
5:00 PM	0	0	944	0	0	0	1,462	0	0	0	0	0	0	0	0	0	2,406
6:00 PM	0	0	610	0	0	0	976	0	0	0	0	0	0	0	0	0	1,586

Growth Rate

Existing Year

Future Year

2%

2023

2030

2030 Signal Warrant Volumes																	Total
Time	BLUFFTON PARKWAY				BLUFFTON PARKWAY								INSPIRATION DRIVE				
	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
6:00 AM	0	1	376	11	0	19	193	1	0	18	0	35	0	7	0	4	665
7:00 AM	0	1	1,190	20	0	37	416	2	0	37	0	69	0	14	0	8	1,794
8:00 AM	0	2	1,006	32	0	60	577	3	0	42	0	76	0	12	0	6	1,816
9:00 AM	0	1	969	42	0	78	602	2	0	45	0	84	0	7	0	4	1,834
10:00 AM	0	2	975	51	0	96	689	3	0	53	0	98	0	4	0	2	1,973
11:00 AM	0	2	1,040	74	0	137	873	3	0	65	0	120	0	4	0	2	2,320
12:00 PM	0	2	930	84	0	154	1,079	4	0	81	0	149	0	5	0	3	2,491
1:00 PM	0	2	837	68	0	125	992	4	0	76	0	140	0	4	0	2	2,250
2:00 PM	0	2	837	60	0	111	1,011	4	0	62	0	113	0	4	0	2	2,206
3:00 PM	0	3	843	61	0	113	1,267	6	0	58	0	106	0	4	0	2	2,463
4:00 PM	0	5	980	73	0	135	1,212	9	0	60	0	111	0	5	0	3	2,593
5:00 PM	0	7	944	87	0	162	1,462	12	0	71	0	133	0	5	0	3	2,886
6:00 PM	0	6	610	84	0	154	976	12	0	75	0	141	0	6	0	3	2,067

NB RT	SB RT	RTR
35	4	35
69	8	69
76	6	76
84	4	84
98	2	98
120	2	120
149	3	149
140	2	140
113	2	113
106	2	106
111	3	111
133	3	133
141	3	141

Appendix C – Traffic Signal Warrant Analysis Worksheets

TRAFFIC SIGNAL WARRANT ANALYSIS - No right-turn reduction

City/County:	Bluffton	85th-percentile speed on the major street exceeds 40 mph? (Y or N)	Y	Analyzed by: Kimley-Horn Analyzed by: WDS
State:	South Carolina	Isolated community with a population of less than 10,000? (Y or N)	N	
Date:	12/4/2023	Apply 56% warrant to Warrant 1, Combination Warrant? (Y or N)	N	
Major Street:	Bluffton Parkway	Approach Lanes - Major? (1 or 2)	2	
Minor Street:	Buckwalter Place Boulevard	Approach Lanes - Minor? (1 or 2)	1	

24-Hour Volume Summary			Major Street Total of Both Approaches	Minor Street Higher Volume Approach	Warrant 1, Condition A Major Street Minor Street		Warrant 1, Condition B Major Street Minor Street		Warrant 1, Combination Warrant				Warrant 2		Warrant 3, Condition A Minor Delay Minor Volume Total Instrctn			Warrant 3, Condition B
									80% of 1A Major Street Minor Street	80% of 1B Major Street Minor Street								
12:00 AM TO 01:00 AM																		
01:00 AM TO 02:00 AM																		
02:00 AM TO 03:00 AM																		
03:00 AM TO 04:00 AM																		
04:00 AM TO 05:00 AM																		
05:00 AM TO 06:00 AM																		
06:00 AM TO 07:00 AM			601	53	143%	50%	95%	100%	125%	44%	83%	88%	41%				22%	
07:00 AM TO 08:00 AM			1666	106	397%	101%	264%	200%	347%	88%	231%	177%	177%				141%	
08:00 AM TO 09:00 AM			1680	118	400%	112%	267%	223%	350%	98%	233%	197%	197%				157%	
09:00 AM TO 10:00 AM			1694	129	403%	123%	269%	243%	353%	108%	235%	215%	215%				172%	
10:00 AM TO 11:00 AM			1816	151	432%	144%	288%	285%	378%	126%	252%	252%	252%				201%	
11:00 AM TO 12:00 PM			2129	185	507%	176%	338%	349%	444%	154%	296%	308%	308%				247%	
12:00 PM TO 01:00 PM			2253	230	536%	219%	358%	434%	469%	192%	313%	383%	383%				307%	
01:00 PM TO 02:00 PM			2028	216	483%	206%	322%	408%	423%	180%	282%	360%	360%				288%	
02:00 PM TO 03:00 PM			2025	175	482%	167%	321%	330%	422%	146%	281%	292%	292%				233%	
03:00 PM TO 04:00 PM			2293	164	546%	156%	364%	309%	478%	137%	318%	273%	273%				219%	
04:00 PM TO 05:00 PM			2414	171	575%	163%	383%	323%	503%	143%	335%	285%	285%				228%	
05:00 PM TO 06:00 PM			2674	204	637%	194%	424%	385%	557%	170%	371%	340%	340%				272%	
06:00 PM TO 07:00 PM			1842	216	439%	206%	292%	408%	384%	180%	256%	360%	360%				288%	
07:00 PM TO 08:00 PM																		
08:00 PM TO 09:00 PM																		
09:00 PM TO 10:00 PM																		
10:00 PM TO 11:00 PM																		
11:00 PM TO 12:00 AM																		
Source: MUTCD, 2009 Edition					Threshold 420 105		Threshold 630 53		Threshold 480 120		Threshold 720 60		MUTCD Figure 4C-1 and 4C-2		Warranting Volumes			MUTCD Figure 4C-3 and 4C-4
Created By: Kimley-Horn and Associates, Inc.					Summary		Summary		Summary		Summary		Summary		Summary			Summary
					TOTAL 12		TOTAL 12		TOTAL 10		TOTAL 12		TOTAL 12		TOTAL			TOTAL 12
					Met? YES		Met? YES		TOTAL 10		Met? YES		Met? Yes		Met?			Met? Yes

COMMENTS/NOTES:	COMMENTS/NOTES:

TRAFFIC SIGNAL WARRANT ANALYSIS- 50% Right-Turn Reduction

City/County:	Bluffton	85th-percentile speed on the major street exceeds 40 mph? (Y or N)	Y	Analyzed by: Kimley-Horn Analyzed by: WDS
State:	South Carolina	Isolated community with a population of less than 10,000? (Y or N)	N	
Date:	12/4/2023	Apply 56% warrant to Warrant 1, Combination Warrant? (Y or N)	N	
Major Street:	Bluffton Parkway	Approach Lanes - Major? (1 or 2)	2	
Minor Street:	Buckwalter Place Boulevard	Approach Lanes - Minor? (1 or 2)	1	

24-Hour Volume Summary			Major Street	Minor Street	Warrant 1, Condition A		Warrant 1, Condition B		Warrant 1, Combination Warrant				Warrant 2	Warrant 3, Condition A			Warrant 3, Condition B
			Total of Both Approaches	Higher Volume Approach	Major Street	Minor Street	Major Street	Minor Street	80% of 1A Major Street	80% of 1A Minor Street	80% of 1B Major Street	80% of 1B Minor Street		Minor Delay	Minor Volume	Total Intrscn	
12:00 AM	TO	01:00 AM															
01:00 AM	TO	02:00 AM															
02:00 AM	TO	03:00 AM															
03:00 AM	TO	04:00 AM															
04:00 AM	TO	05:00 AM															
05:00 AM	TO	06:00 AM															
06:00 AM	TO	07:00 AM	601	36	143%	34%	95%	68%	125%	30%	83%	60%	28%				15%
07:00 AM	TO	08:00 AM	1666	72	397%	69%	264%	136%	347%	60%	231%	120%	120%				96%
08:00 AM	TO	09:00 AM	1680	80	400%	76%	267%	151%	350%	67%	233%	133%	133%				107%
09:00 AM	TO	10:00 AM	1694	87	403%	83%	269%	164%	353%	73%	235%	145%	145%				116%
10:00 AM	TO	11:00 AM	1816	102	432%	97%	288%	192%	378%	85%	252%	170%	170%				136%
11:00 AM	TO	12:00 PM	2129	125	507%	119%	338%	236%	444%	104%	296%	208%	208%				167%
12:00 PM	TO	01:00 PM	2253	156	536%	149%	358%	294%	469%	130%	313%	260%	260%				208%
01:00 PM	TO	02:00 PM	2028	146	483%	139%	322%	275%	423%	122%	282%	243%	243%				195%
02:00 PM	TO	03:00 PM	2025	119	482%	113%	321%	225%	422%	99%	281%	198%	198%				159%
03:00 PM	TO	04:00 PM	2293	111	546%	106%	364%	209%	478%	93%	318%	185%	185%				148%
04:00 PM	TO	05:00 PM	2414	116	575%	110%	383%	219%	503%	97%	335%	193%	193%				155%
05:00 PM	TO	06:00 PM	2674	138	637%	131%	424%	260%	557%	115%	371%	230%	230%				184%
06:00 PM	TO	07:00 PM	1842	146	439%	139%	292%	275%	384%	122%	256%	243%	243%				195%
07:00 PM	TO	08:00 PM															
08:00 PM	TO	09:00 PM															
09:00 PM	TO	10:00 PM															
10:00 PM	TO	11:00 PM															
11:00 PM	TO	12:00 AM															
Source: MUTCD, 2009 Edition					Threshold		Threshold		Threshold		Threshold		MUTCD Figure	Warranting Volumes			MUTCD Figure
Created By: Kimley-Horn and Associates, Inc.					420 105		630 53		480 120		720 60		4C-1 and 4C-2				4C-3 and 4C-4
					Summary		Summary		Summary		Summary			Summary			Summary
					TOTAL 8		TOTAL 12		TOTAL 5		TOTAL 12		TOTAL 12	TOTAL			TOTAL 11
					Met? YES		Met? YES		TOTAL 5		Met? NO		Met? Yes	Met?			Met? Yes

COMMENTS/NOTES:	COMMENTS/NOTES:

TRAFFIC SIGNAL WARRANT ANALYSIS - 100% Right-Turn Reduction

City/County:	Bluffton	85th-percentile speed on the major street exceeds 40 mph? (Y or N)	Y	Analyzed by: Kimley-Horn
State:	South Carolina	Isolated community with a population of less than 10,000? (Y or N)	N	
Date:	12/4/2023	Apply 56% warrant to Warrant 1, Combination Warrant? (Y or N)	N	
Major Street:	Bluffton Parkway	Approach Lanes - Major? (1 or 2)	2	Analyzed by: WDS
Minor Street:	Buckwalter Place Boulevard	Approach Lanes - Minor? (1 or 2)	1	

24-Hour Volume Summary			Major Street	Minor Street	Warrant 1, Condition A		Warrant 1, Condition B		Warrant 1, Combination Warrant				Warrant 2	Warrant 3, Condition A			Warrant 3, Condition B	
			Total of Both Approaches	Higher Volume Approach					80% of 1A		80% of 1B			Minor Delay	Minor Volume	Total Intrscn		
12:00 AM	TO	01:00 AM																
01:00 AM	TO	02:00 AM																
02:00 AM	TO	03:00 AM																
03:00 AM	TO	04:00 AM																
04:00 AM	TO	05:00 AM																
05:00 AM	TO	06:00 AM																
06:00 AM	TO	07:00 AM	601	18	143%	17%	95%	34%	125%	15%	83%	30%	14%			7%		
07:00 AM	TO	08:00 AM	1666	37	397%	35%	264%	70%	347%	31%	231%	62%	62%			49%		
08:00 AM	TO	09:00 AM	1680	42	400%	40%	267%	79%	350%	35%	233%	70%	70%			56%		
09:00 AM	TO	10:00 AM	1694	45	403%	43%	269%	85%	353%	38%	235%	75%	75%			60%		
10:00 AM	TO	11:00 AM	1816	53	432%	50%	288%	100%	378%	44%	252%	88%	88%			71%		
11:00 AM	TO	12:00 PM	2129	65	507%	62%	338%	123%	444%	54%	296%	108%	108%			87%		
12:00 PM	TO	01:00 PM	2253	81	536%	77%	358%	153%	469%	68%	313%	135%	135%			108%		
01:00 PM	TO	02:00 PM	2028	76	483%	72%	322%	143%	423%	63%	282%	127%	127%			101%		
02:00 PM	TO	03:00 PM	2025	62	482%	59%	321%	117%	422%	52%	281%	103%	103%			83%		
03:00 PM	TO	04:00 PM	2293	58	546%	55%	364%	109%	478%	48%	318%	97%	97%			77%		
04:00 PM	TO	05:00 PM	2414	60	575%	57%	383%	113%	503%	50%	335%	100%	100%			80%		
05:00 PM	TO	06:00 PM	2674	71	637%	68%	424%	134%	557%	59%	371%	118%	118%			95%		
06:00 PM	TO	07:00 PM	1842	75	439%	71%	292%	142%	384%	63%	256%	125%	125%			100%		
07:00 PM	TO	08:00 PM																
08:00 PM	TO	09:00 PM																
09:00 PM	TO	10:00 PM																
10:00 PM	TO	11:00 PM																
11:00 PM	TO	12:00 AM																
Source: MUTCD, 2009 Edition Created By: Kimley-Horn and Associates, Inc.			Threshold		Threshold		Threshold		Threshold		Threshold		MUTCD Figure		Warranting Volumes			MUTCD Figure
			420 105		630 53		480 120		720 60		4C-1 and 4C-2					4C-3 and 4C-4		
			Summary		Summary		Summary		Summary		Summary					Summary		
			TOTAL 0		TOTAL 9		TOTAL 0		TOTAL 7		TOTAL 7					TOTAL 3		
			Met? NO		Met? YES		Met? YES		TOTAL 0		Met? NO		Met? Yes					Met? Yes

COMMENTS/NOTES:	COMMENTS/NOTES: