final report

February 26, 2016

Traffic Impact Study

Sutherland Pointe
Aiken Road

Prepared for

Louisville Metro

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INTRODUCTION

The development plan for the Sutherland Pointe residential subdivision on Aiken Road shows 241 buildable single family lots. **Figure 1** displays a map of the site. The recently approved Stapleton Ridge is also shown in Figure 1. Access to the development will be from Aiken Road at two entrances. Eleven lots will access Aiken Road using the existing Old Aiken Road. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study the impact area was defined as the intersections of Aiken Road at Beckley Station Road, Arnold Palmer Boulevard, Bush Farm Road, and Bush Farm Road at Old Henry Road.

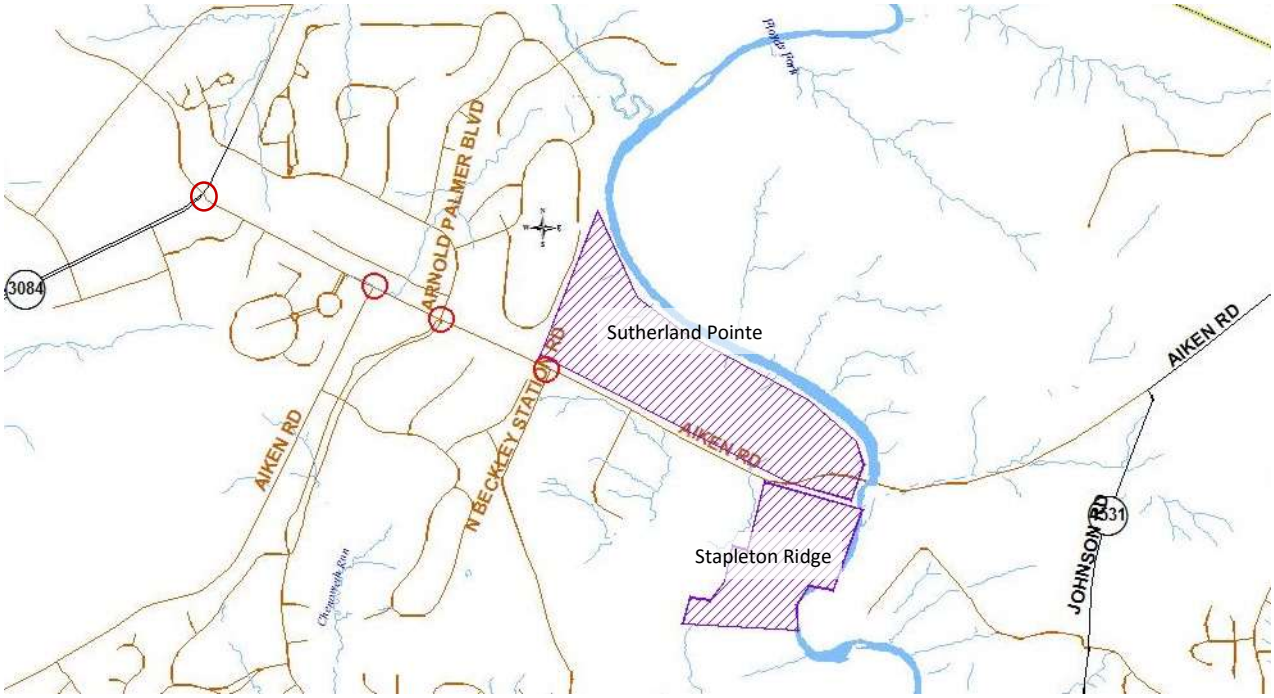


Figure 1. Site Map

EXISTING CONDITIONS

Aiken Road is a Metro Louisville maintained road with an estimated 2015 Average Annual Daily Traffic (AADT) volume of 7,000 vehicles per day east of Beckley Station, as estimated from the turning movement count. The road is two lanes with ten-foot lanes and a one-foot shoulder. The speed limit is 35 mph. There are no sidewalks. The intersections are controlled with a stop sign.

Bush Farm Road is a Metro Louisville maintained road with an estimated 2015 ADT of 9,700 vehicles per day between Old Henry Road and Promenade Green Way, as estimated from the turning movement count. The road is a two-lane highway with 11 foot lanes. There are exclusive left turn lanes at the intersections with Old Henry Road, Promenade Green Way, and Bush Ridge Drive. The speed limit is 35 mph. There are sidewalks along the south side, east of Promenade Green Way.

A.m. and p.m. peak hour turning movement counts for the intersection were made on various dates (see Appendix A). The a.m. peak occurred between 7:15 and 8:15 and the p.m. peak hour occurred between 4:45 and 5:45. **Figure 2** illustrates the 2015 peak hour traffic volumes.

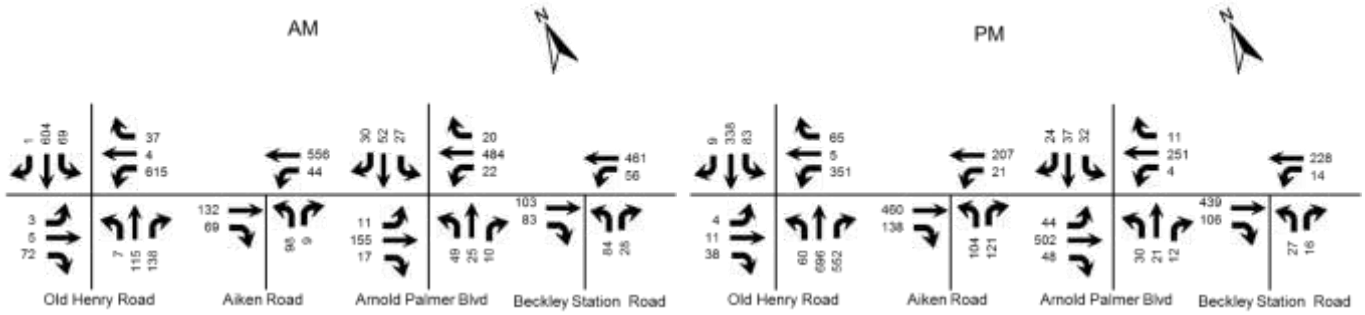


Figure 2. 2015 Peak Hour Volumes

FUTURE CONDITIONS

The build-out year for this project is 2021. To determine the traffic volumes in 2021, the traffic generated by the approved plans for Stapleton Ridge, the Bush Farm retirement community, and Old Henry Crossings was added to the 2015 volumes. Additionally, one percent annual growth was added to the through volumes on Old Henry Road. **Figure 3** displays the 2021 No Build volumes.

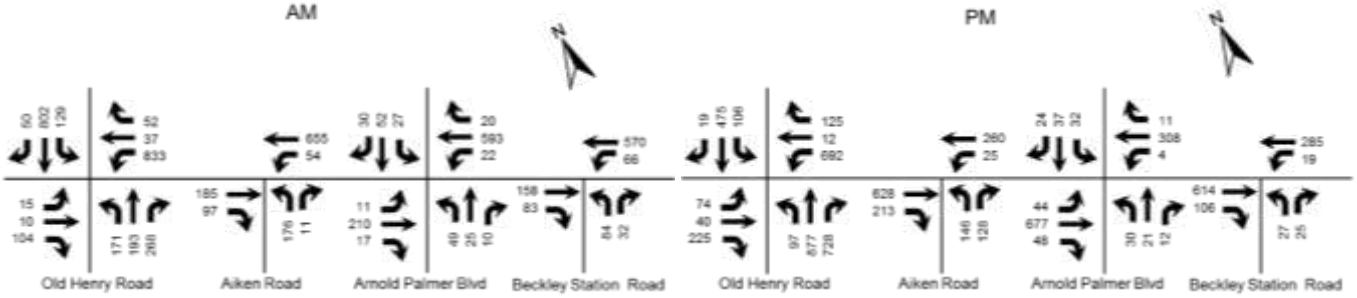


Figure 3. 2021 Peak Hour No Build

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 9th Edition contains trip generation rates for a wide range of developments. The land use of "Single-Family Detached Housing" was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The results of the trip generation analysis are that this development will generate 178 a.m. peak hour trips and 232 p.m. peak hour trips. The trips were assigned to the highway network with 80 percent to the west and 20 percent to the east. **Figure 4** shows the trips generated by this development and distributed throughout the road network for the year 2021 during the peak hours. **Figure 5** displays the individual turning movements for the year 2021 for the peak hours when the development is completed.

Table 1. Peak Hour Trips Generated by Site

	A.M. Peak Hour			P.M. Peak Hour		
Land Use	Trips	IN	OUT	Trips	IN	OUT
Single-Family Detached (210)	178	44	134	232	146	86

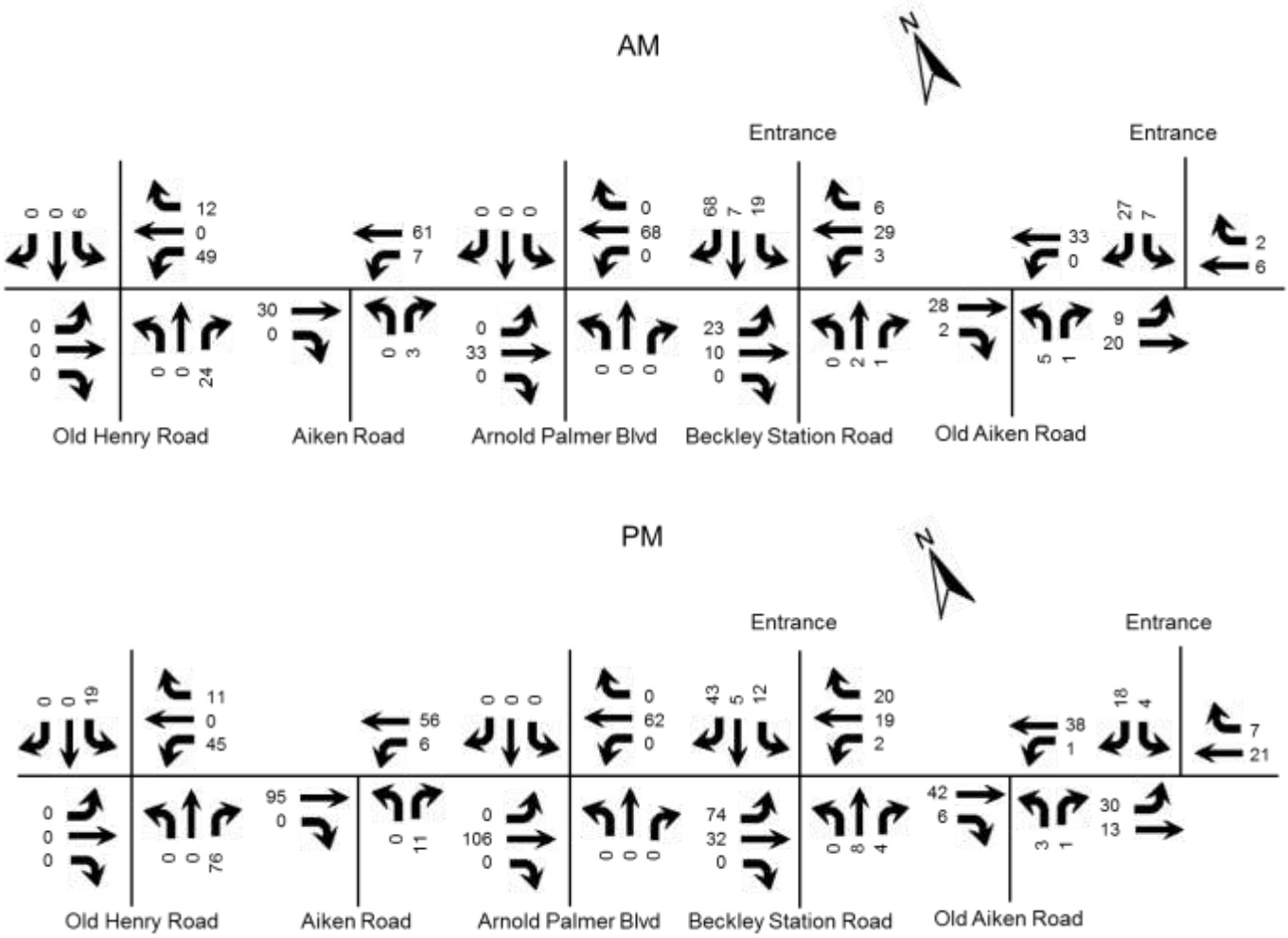


Figure 4. Hour Trips Generated by Site

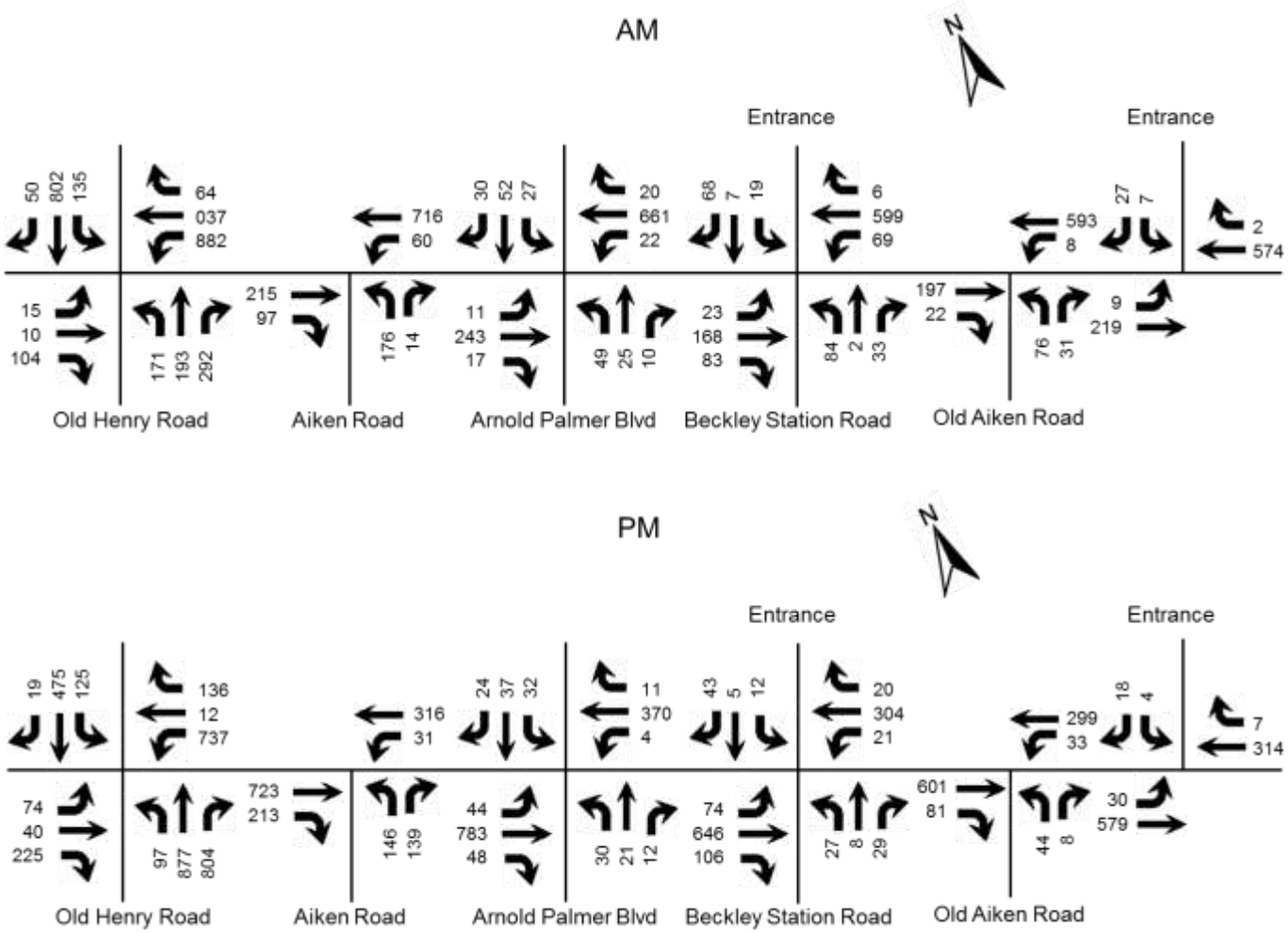


Figure 5. 2021 Peak Hour Build

ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service" or LOS. Level of Service is a ranking scale from A through F with each level representing a range. LOS results depend upon the type of facility that is analyzed. In this case, the LOS is based upon the average vehicle delay each movement experiences at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersection were determined using procedures detailed in the Highway Capacity Manual, 2010 edition. Average delay and Level of Service were determined for the intersection using HCS 2010 Streets and TWSC (version 6.7) software. **Table 2** shows the results of the analysis.

Table 2. Peak Hour Level of Service

Approach	A.M.			P.M.		
	2015 Existing	2021 No Build	2021 Build	2015 Existing	2021 No Build	2021 Build
Aiken Road at Beckley Station Road						
Aiken Road Eastbound	NA	NA	A 9.2	NA	NA	A 8.1
Aiken Road Westbound	A 7.8	A 8.0	A 8.0	A 8.6	A 9.3	A 9.4
Beckley Station Northbound	C 20.4	D 30.2	E 37.1	B 14.8	C 18.7	C 15.9
Sutherland Pointe Entrance Southbound	NA	NA	C 16.7	NA	NA	B 13.1
Aiken Road at Arnold Palmer Boulevard						
Aiken Road Eastbound	A 8.6	A 9.0	A 9.2	A 7.9	A 8.0	A 8.2
Aiken Road Westbound	A 7.6	A 7.8	A 7.9	A 8.2	A 9.2	A 9.6
Arnold Palmer Boulevard Northbound	D 25.3	E 38.5	F 53.8	C 24.9	E 40.5	F 65.2
Arnold Palmer Boulevard Southbound	C 21.8	D 30.4	E 39.1	C 24.0	E 39.2	F 64.0
Aiken Road at Bush Farm Road						
Aiken Road Westbound	A 7.8	A 8.0	A 8.1	A 8.9	A 9.9	B 10.5
Aiken Road Northbound	C 23.6	F 86.2	F 140.8	D 25.5	F 113.1	F 227.6
Old Henry Road at Bush Farm Road	**C 30.5**	**F 88.2**	**F 99.1**	**B 18.4**	**F 138.1**	**F 165.6**
Bush Farm Road Eastbound	B 11.5	B 13.4	B 13.4	B 16.9	B 20.0	C 20.1
Bush Farm Road Westbound	D 47.6	F 151.8	F 179.8	C 24.5	F 316.7	F 357.6
Old Henry Road Northbound	B 18.5	F 88.8	F 87.3	B 17.8	F 93.9	F 114.4
Old Henry Road Southbound	C 20.8	D 37.8	D 37.8	B 14.2	F 83.6	F 117.6

Approach	A.M.			P.M.		
	2015 Existing	2021 No Build	2021 Build	2015 Existing	2021 No Build	2021 Build
Aiken Road at Sutherland Pointe Entrance (East)						
Aiken Road Westbound			A 9.0			A 8.0
Sutherland Pointe Entrance Southbound			C 15.1			B 11.8

Key: Level of Service, Delay in seconds per vehicle

The western entrance will align with Beckley Station Road. The intersection will include left turn lanes for eastbound and westbound traffic. The eastbound direction will also meet the warrants for right turn lane. Beckley Station Road northbound should be widened to include a left turn lane.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2021, there will be manageable impact to the existing highway network. The delays experienced will increase, but will continue to operate at an acceptable Level of Service.

The intersection of Aiken Road at Bush Farm Road will experience increases in delay in the No Build condition. The intersection should be monitored to determine if a roundabout or traffic signal could provide improvement to the operating condition.

Metro Public Works should continue to monitor the traffic patterns from Old Henry Road Crossing South and the impact on the Bush Farm Road intersections with Old Henry Road. If the projections from the Old Henry Road Crossing traffic study are confirmed, additional improvements are needed at the intersection.

APPENDIX

Traffic Count

Study Name Aiken Rd & Beckley Station Rd

Start Date 10/22/2015

Start Time 7:00 AM

Site Code

	uthbound Approa Southbound		arthbound Approa Northbound		astbound Approa Eastbound		
Start Time	Right	Thru	Thru	Left	Right	Left	TOTAL
7:00 AM	5	13	103	4	0	3	128
7:15 AM	26	14	125	20	1	7	193
7:30 AM	51	17	111	31	11	25	246
7:45 AM	3	28	126	5	13	43	218
8:00 AM	3	44	99	0	3	9	158
8:15 AM	6	35	89	3	1	9	143
8:30 AM	5	31	118	1	0	17	172
8:45 AM	5	37	106	7	1	12	168
4:00 PM	24	101	42	5	10	26	208
4:15 PM	15	72	63	1	5	13	169
4:30 PM	18	84	48	2	3	10	165
4:45 PM	38	97	64	3	5	9	216
5:00 PM	22	104	52	2	7	5	192
5:15 PM	20	122	60	7	2	4	215
5:30 PM	26	116	52	2	2	9	207
5:45 PM	21	102	56	4	2	9	194

	uthbound Approa Southbound		arthbound Approa Northbound		astbound Approa Eastbound		
Start Time	Right	Thru	Thru	Left	Right	Left	TOTAL
7:15 AM	26	14	125	20	1	7	193
7:30 AM	51	17	111	31	11	25	246
7:45 AM	3	28	126	5	13	43	218
8:00 AM	3	44	99	0	3	9	158
TOTAL	**83**	**103**	**461**	**56**	**28**	**84**	**815**
4:45 PM	38	97	64	3	5	9	216
5:00 PM	22	104	52	2	7	5	192
5:15 PM	20	122	60	7	2	4	215
5:30 PM	26	116	52	2	2	9	207
TOTAL	**106**	**439**	**228**	**14**	**16**	**27**	**830**

Study Name Aiken Rd & Arnold Palmer Dr
Start Date 10/22/2015
Start Time 7:00 AM
Site Code

	Southbound Approach Southbound			Westbound Approach Westbound			Northbound Approach Northbound			Eastbound Approach Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	3	15	3	6	5	1	1	117	6	2	1	2	162
7:15 AM	1	43	3	8	16	16	4	117	6	6	5	15	240
7:30 AM	5	37	3	7	12	5	10	129	6	1	3	11	229
7:45 AM	4	35	3	3	21	4	6	141	9	2	10	10	248
8:00 AM	7	40	2	12	3	2	0	97	1	1	7	13	185
8:15 AM	8	36	4	8	2	2	2	101	1	2	6	8	180
8:30 AM	3	29	6	8	6	2	6	121	11	4	8	13	217
8:45 AM	4	40	3	6	11	2	1	91	11	5	8	22	204
4:00 PM	7	103	8	4	11	5	6	65	2	5	7	5	228
4:15 PM	6	88	6	3	16	2	5	63	4	2	3	4	202
4:30 PM	18	103	9	4	10	5	3	61	6	3	4	6	232
4:45 PM	14	120	14	16	11	8	1	51	4	5	7	4	255
5:00 PM	9	130	12	10	11	3	1	62	0	1	6	6	251
5:15 PM	15	135	14	11	8	3	2	63	1	1	5	7	265
5:30 PM	7	125	11	7	8	12	4	53	1	3	7	5	243
5:45 PM	17	112	7	4	10	6	4	73	2	7	3	12	257

	Southbound Approach Southbound			Westbound Approach Westbound			Northbound Approach Northbound			Eastbound Approach Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:15 AM	1	43	3	8	16	16	4	117	6	6	5	15	240
7:30 AM	5	37	3	7	12	5	10	129	6	1	3	11	229
7:45 AM	4	35	3	3	21	4	6	141	9	2	10	10	248
8:00 AM	7	40	2	12	3	2	0	97	1	1	7	13	185
TOTAL	**17**	**155**	**11**	**30**	**52**	**27**	**20**	**484**	**22**	**10**	**25**	**49**	**902**
5:00 PM	9	130	12	10	11	3	1	62	0	1	6	6	251
5:15 PM	15	135	14	11	8	3	2	63	1	1	5	7	265
5:30 PM	7	125	11	7	8	12	4	53	1	3	7	5	243
5:45 PM	17	112	7	4	10	6	4	73	2	7	3	12	257
TOTAL	**48**	**502**	**44**	**32**	**37**	**24**	**11**	**251**	**4**	**12**	**21**	**30**	**1016**

Study Name Bush Farm Rd & Aiken Rd
Start Date 10/27/2015
Start Time 7:00 AM
Site Code

	Southbound Approach Southbound		Northbound Approach Northbound		Eastbound Approach Eastbound		
Start Time	Right	Thru	Thru	Left	Right	Left	TOTAL
7:00 AM	19	17	146	5	3	20	210
7:15 AM	14	46	108	11	3	20	202
7:30 AM	14	35	159	14	1	31	254
7:45 AM	22	34	143	14	2	27	242
8:00 AM	27	26	105	16	6	24	204
8:15 AM	30	15	119	13	5	17	199
8:30 AM	50	16	114	23	8	24	235
8:45 AM	72	33	82	27	13	59	286
4:00 PM	19	84	42	5	29	55	234
4:15 PM	22	92	45	3	17	28	207
4:30 PM	29	104	51	4	22	24	234
4:45 PM	45	126	47	8	30	27	283
5:00 PM	31	108	46	2	26	28	241
5:15 PM	30	108	49	4	29	32	252
5:30 PM	32	118	65	7	36	17	275
5:45 PM	20	106	64	5	44	24	263

	Southbound Approach Southbound		Northbound Approach Northbound		Eastbound Approach Eastbound		
Start Time	Right	Thru	Thru	Left	Right	Left	TOTAL
7:00 AM	19	17	146	5	3	20	210
7:15 AM	14	46	108	11	3	20	202
7:30 AM	14	35	159	14	1	31	254
7:45 AM	22	34	143	14	2	27	242
TOTAL	**69**	**132**	**556**	**44**	**9**	**98**	**908**
4:45 PM	45	126	47	8	30	27	283
5:00 PM	31	108	46	2	26	28	241
5:15 PM	30	108	49	4	29	32	252
5:30 PM	32	118	65	7	36	17	275
TOTAL	**138**	**460**	**207**	**21**	**121**	**104**	**1051**

11940 Highway 42, Suite 1
Goshen, KY 40026

Counted by: Andy Wolak

File Name : OldHenryBushFarmAM
Site Code : 00062151
Start Date : 6/2/2015
Page No : 1

Groups Printed- Unshifted

	Old Henry Road From North				Bush Farm Road From East				Old Henry Road From South				Bush Farm Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	10	142	0	152	121	0	5	126	2	16	16	34	0	1	10	11	323
07:15 AM	8	169	1	178	119	0	9	128	2	12	36	50	0	0	9	9	365
07:30 AM	8	150	0	158	155	0	12	167	2	33	34	69	0	3	19	22	416
07:45 AM	14	158	0	172	161	1	9	171	1	20	42	63	2	1	14	17	423
Total	40	619	1	660	556	1	35	592	7	81	128	216	2	5	52	59	1527
08:00 AM	24	147	1	172	153	2	11	166	2	34	29	65	1	1	16	18	421
08:15 AM	23	149	0	172	146	1	5	152	2	28	33	63	0	0	23	23	410
08:30 AM	14	139	0	153	127	0	7	134	3	25	62	90	0	2	12	14	391
08:45 AM	46	126	2	174	149	1	13	163	4	31	74	109	1	3	11	15	461
Total	107	561	3	671	575	4	36	615	11	118	198	327	2	6	62	70	1683
Grand Total	147	1180	4	1331	1131	5	71	1207	18	199	326	543	4	11	114	129	3210
Apprch %	11	88.7	0.3		93.7	0.4	5.9		3.3	36.6	60		3.1	8.5	88.4		
Total %	4.6	36.8	0.1	41.5	35.2	0.2	2.2	37.6	0.6	6.2	10.2	16.9	0.1	0.3	3.6	4	

	Old Henry Road From North				Bush Farm Road From East				Old Henry Road From South				Bush Farm Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	24	147	1	172	**153**	**2**	11	**166**	2	**34**	29	65	**1**	1	16	18	421
08:15 AM	23	**149**	0	172	146	1	5	152	2	28	33	63	0	0	**23**	**23**	410
08:30 AM	14	139	0	153	127	0	7	134	3	25	62	90	0	2	12	14	391
08:45 AM	**46**	126	**2**	**174**	149	1	**13**	163	**4**	31	**74**	**109**	1	**3**	11	15	**461**
Total Volume	107	561	3	671	575	4	36	615	11	118	198	327	2	6	62	70	1683

Counted by: Andy Wolak

File Name : OldHenryBushFarmPM
Site Code : 00062152
Start Date : 6/2/2015
Page No : 1

Groups Printed- Unshifted

	Old Henry Road From North				Bush Farm Road From East				Old Henry Road From South				Bush Farm Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	19	57	1	77	97	4	21	122	13	99	105	217	0	1	4	5	421
04:15 PM	12	65	1	78	89	3	11	103	5	93	108	206	0	0	7	7	394
04:30 PM	20	65	1	86	67	0	15	82	15	126	99	240	0	1	7	8	416
04:45 PM	32	83	2	117	78	0	15	93	10	134	123	267	2	0	9	11	488
Total	83	270	5	358	331	7	62	400	43	452	435	930	2	2	27	31	1719
05:00 PM	27	91	2	120	107	1	11	119	25	175	145	345	0	3	6	9	593
05:15 PM	16	86	3	105	81	1	31	113	15	185	141	341	1	3	8	12	571
05:30 PM	18	81	2	101	77	1	12	90	13	175	131	319	2	3	12	17	527
05:45 PM	22	80	2	104	86	2	11	99	7	161	135	303	1	2	12	15	521
Total	83	338	9	430	361	5	65	421	60	696	552	1308	4	11	38	53	2212
Grand Total	166	608	14	788	682	12	127	821	103	1148	987	2238	6	13	65	84	3931
Apprch %	21.1	77.2	1.8		83.1	1.5	15.5		4.6	51.3	44.1		7.1	15.5	77.4		
Total %	4.2	15.5	0.4	20	17.3	0.3	3.2	20.9	2.6	29.2	25.1	56.9	0.2	0.3	1.7	2.1	

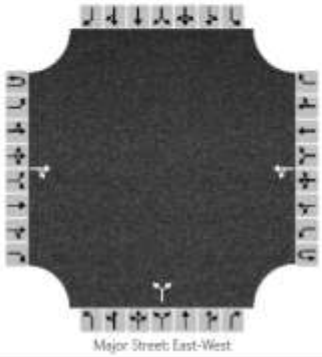
	Old Henry Road From North				Bush Farm Road From East				Old Henry Road From South				Bush Farm Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**27**	**91**	2	**120**	**107**	1	11	**119**	**25**	175	**145**	**345**	0	**3**	6	9	**593**
05:15 PM	16	86	**3**	105	81	1	**31**	113	15	**185**	141	341	1	3	8	12	571
05:30 PM	18	81	2	101	77	1	12	90	13	175	131	319	**2**	3	**12**	**17**	527
05:45 PM	22	80	2	104	86	**2**	11	99	7	161	135	303	1	2	12	15	521
Total Volume	83	338	9	430	351	5	65	421	60	696	552	1308	4	11	38	53	2212
% App. Total	19.3	78.6	2.1		83.4	1.2	15.4		4.6	53.2	42.2		7.5	20.8	71.7		
PHF	.769	.929	.750	.896	.820	.625	.524	.884	.600	.941	.952	.948	.500	.917	.792	.779	.933

HCS Reports

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2015	North/South Street	Beckley Stations
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			103	83		56	461			84		28				
Percent Heavy Vehicles						1				3		3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

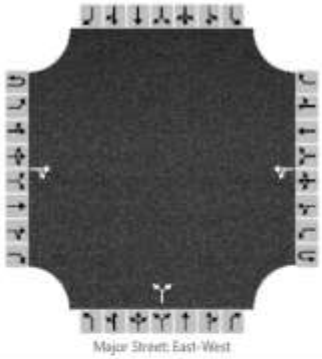
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						622					135					
Capacity						1350					367					
v/c Ratio						0.46					0.37					
95% Queue Length						0.2					1.7					
Control Delay (s/veh)						7.8					20.4					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					1.3				20.4							
Approach LOS					A				C							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Beckley Stations
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			158	83		66	570			84		32				
Percent Heavy Vehicles						1				3		3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

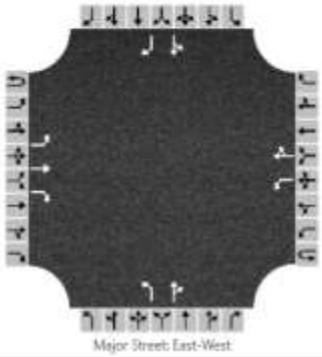
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						767					140					
Capacity						1277					279					
v/c Ratio						0.60					0.50					
95% Queue Length						0.2					2.6					
Control Delay (s/veh)						8.0					30.2					
Level of Service (LOS)						A					D					
Approach Delay (s/veh)					1.6				30.2							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley Station
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Beckley Station/Entrance
Time Analyzed	AM Peak Build	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	0		1	1	0		0	1	1
Configuration		L	T	R		L		TR		L		TR		LT		R
Volume (veh/h)		23	168	83		69	599	6		84	2	33		19	7	68
Percent Heavy Vehicles		1				1				1	3	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

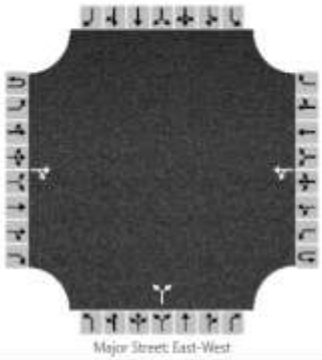
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		28				83				101		42		31		82
Capacity		879				1264				178		882		332		426
v/c Ratio		0.03				0.07				0.57		0.05		0.09		0.19
95% Queue Length		0.1				0.2				3.0		0.1		0.3		0.7
Control Delay (s/veh)		9.2				8.0				48.6		9.3		17.0		15.4
Level of Service (LOS)		A				A				E		A		C		C
Approach Delay (s/veh)	0.8				0.8				37.1				16.7			
Approach LOS	A				A				E				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2015	North/South Street	Beckley Stations
Time Analyzed	PM Peak	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			439	106		14	228			27		16				
Percent Heavy Vehicles						1				3		3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

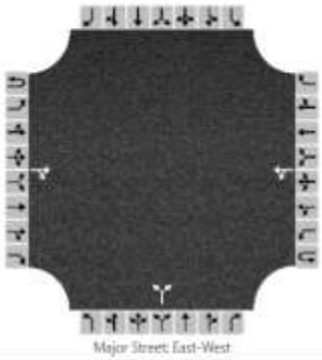
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						253					45					
Capacity						1010					414					
v/c Ratio						0.25					0.11					
95% Queue Length						0.0					0.4					
Control Delay (s/veh)						8.6					14.8					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.6				14.8							
Approach LOS					A				B							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Beckley Stations
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			614	106		19	285			27		25				
Percent Heavy Vehicles						1				3		3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

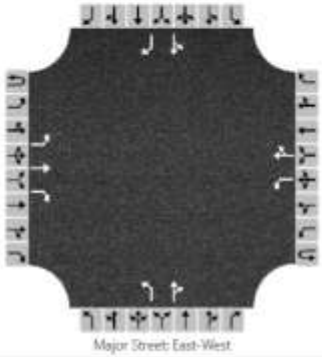
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						317					54					
Capacity						864					316					
v/c Ratio						0.37					0.17					
95% Queue Length						0.1					0.6					
Control Delay (s/veh)						9.3					18.7					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					0.8				18.7							
Approach LOS					A				C							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Beckley Station
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Beckley Station/Entrance
Time Analyzed	PM Peak Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	0		1	1	0		0	1	1
Configuration		L	T	R		L		TR		L		TR		LT		R
Volume (veh/h)		74	646	106		21	304	20		27	8	29		12	5	43
Percent Heavy Vehicles		1				1				1	3	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

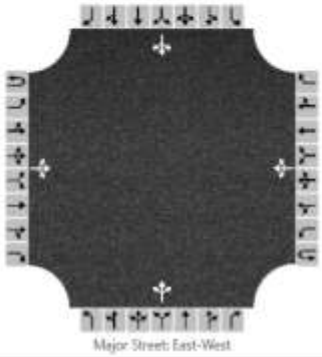
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		77				22				28		38		17		45
Capacity		1226				839				244		576		321		716
v/c Ratio		0.06				0.03				0.11		0.07		0.05		0.06
95% Queue Length		0.2				0.1				0.4		0.2		0.2		0.2
Control Delay (s/veh)		8.1				9.4				21.7		11.7		16.8		10.4
Level of Service (LOS)		A				A				C		B		C		B
Approach Delay (s/veh)	0.7				0.6				15.9				13.1			
Approach LOS	A				A				C				B			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2015	North/South Street	Arnold Palmer Boulevard
Time Analyzed	AM Peak	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		11	155	17		22	484	20		49	25	10		27	52	30
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

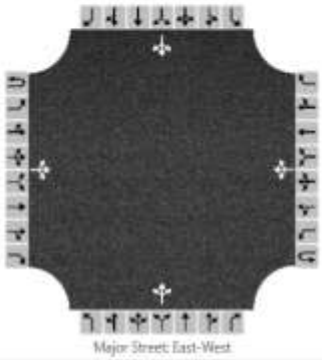
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12				24					92				120	
Capacity		1021				1391					268				333	
v/c Ratio		0.01				0.02					0.34				0.36	
95% Queue Length		0.0				0.1					1.5				1.6	
Control Delay (s/veh)		8.6				7.6					25.3				21.8	
Level of Service (LOS)		A				A					D				C	
Approach Delay (s/veh)	0.6				0.5				25.3				21.8			
Approach LOS	A				A				D				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Arnold Palmer Boulevard
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		11	210	17		22	593	20		49	25	10		27	52	30
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

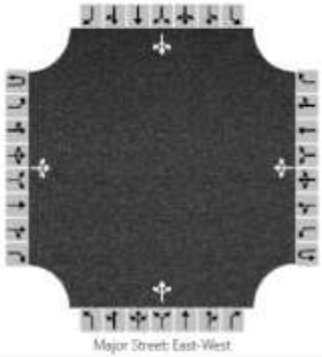
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12				24					92				120	
Capacity		922				1321					196				259	
v/c Ratio		0.01				0.02					0.47				0.46	
95% Queue Length		0.0				0.1					2.3				2.3	
Control Delay (s/veh)		9.0				7.8					38.5				30.4	
Level of Service (LOS)		A				A					E				D	
Approach Delay (s/veh)	0.5				0.5				38.5				30.4			
Approach LOS	A				A				E				D			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Arnold Palmer Boulevard
Time Analyzed	AM Peak Build	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		11	243	17		22	661	20		49	25	10		27	52	30
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

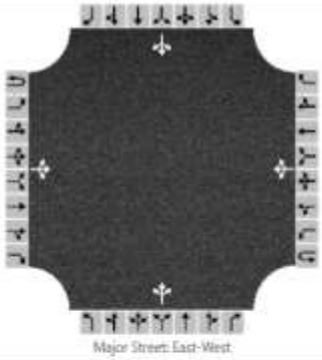
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12				24					92				120	
Capacity		865				1282					161				221	
v/c Ratio		0.01				0.02					0.57				0.54	
95% Queue Length		0.0				0.1					3.0				2.9	
Control Delay (s/veh)		9.2				7.9					53.8				39.1	
Level of Service (LOS)		A				A					F				E	
Approach Delay (s/veh)	0.5				0.5				53.8				39.1			
Approach LOS	A				A				F				E			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2015	North/South Street	Arnold Palmer Boulevard
Time Analyzed	PM Peak Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		44	502	48		4	251	11		30	21	12		32	37	24
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

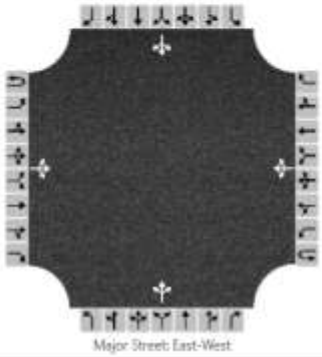
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		46				4					65				97	
Capacity		1297				1005					245				285	
v/c Ratio		0.04				0.00					0.26				0.34	
95% Queue Length		0.1				0.0					1.0				1.5	
Control Delay (s/veh)		7.9				8.6					24.9				24.0	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	1.0				0.2				24.9				24.0			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Arnold Palmer Boulevard
Time Analyzed	PM Peak Build No Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		44	677	48		4	308	11		30	21	12		32	37	24
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

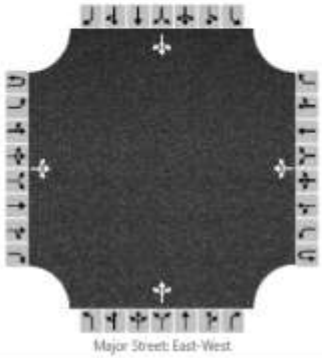
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		46				4					65				97	
Capacity		1233				860					165				199	
v/c Ratio		0.04				0.00					0.40				0.49	
95% Queue Length		0.1				0.0					1.7				2.4	
Control Delay (s/veh)		8.0				9.2					40.5				39.2	
Level of Service (LOS)		A				A					E				E	
Approach Delay (s/veh)	1.0				0.2				40.5				39.2			
Approach LOS	A				A				E				E			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Arnold Palmer
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Arnold Palmer Boulevard
Time Analyzed	PM Peak Build Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		44	783	48		4	370	11		30	21	12		32	37	24
Percent Heavy Vehicles		1				1				1	1	1		1	1	1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

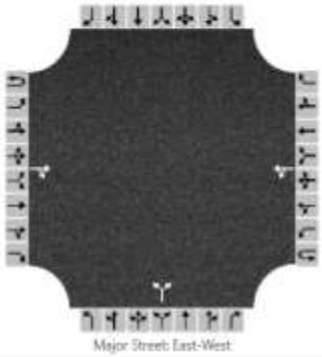
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		46				4					65				97	
Capacity		1168				782					121				151	
v/c Ratio		0.04				0.01					0.54				0.64	
95% Queue Length		0.1				0.0					2.6				3.5	
Control Delay (s/veh)		8.2				9.6					65.2				64.0	
Level of Service (LOS)		A				A					F				F	
Approach Delay (s/veh)	1.0				0.2				65.2				64.0			
Approach LOS	A				A				F				F			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2015	North/South Street	Aiken Road
Time Analyzed	AM Peak	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			132	69		44	556			98		9				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

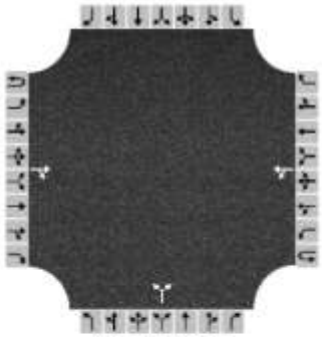
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						674					120					
Capacity						1348					312					
v/c Ratio						0.50					0.38					
95% Queue Length						0.1					1.7					
Control Delay (s/veh)						7.8					23.6					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					1.0				23.6							
Approach LOS					A				C							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2021	North/South Street	Aiken Road
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			185	97		54	655			176		11				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

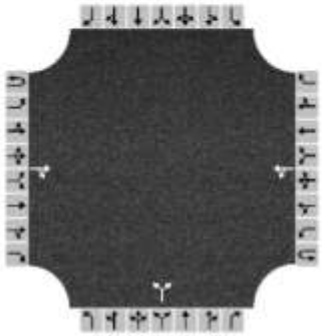
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						797					210					
Capacity						1248					228					
v/c Ratio						0.64					0.92					
95% Queue Length						0.2					7.8					
Control Delay (s/veh)						8.0					86.2					
Level of Service (LOS)						A					F					
Approach Delay (s/veh)					1.2				86.2							
Approach LOS					A				F							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2021	North/South Street	Aiken Road
Time Analyzed	AM Peak Build	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			215	97		60	716			176		14				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

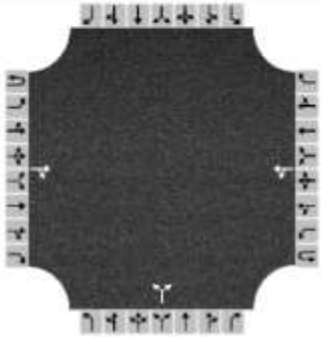
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						871					214					
Capacity						1213					196					
v/c Ratio						0.72					1.09					
95% Queue Length						0.2					10.1					
Control Delay (s/veh)						8.1					140.8					
Level of Service (LOS)						A					F					
Approach Delay (s/veh)					1.4				140.8							
Approach LOS					A				F							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2015	North/South Street	Aiken Road
Time Analyzed	PM Peak	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			460	138		21	207			104		121				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

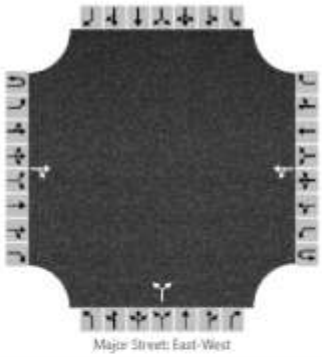
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						246					242					
Capacity						946					411					
v/c Ratio						0.26					0.59					
95% Queue Length						0.1					3.7					
Control Delay (s/veh)						8.9					25.5					
Level of Service (LOS)						A					D					
Approach Delay (s/veh)					1.1				25.5							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2021	North/South Street	Aiken Road
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			628	213		25	260			146		128				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

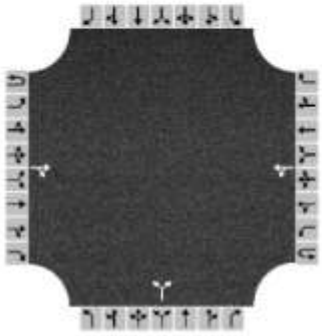
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						307					295					
Capacity						756					277					
v/c Ratio						0.41					1.07					
95% Queue Length						0.1					11.7					
Control Delay (s/veh)						9.9					113.1					
Level of Service (LOS)						A					F					
Approach Delay (s/veh)					1.3				113.1							
Approach LOS					A				F							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Bush Farm
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road/Bush Farm Road
Analysis Year	2021	North/South Street	Aiken Road
Time Analyzed	PM Peak Build	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

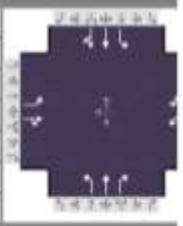
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			723	213		31	316			146		139				
Percent Heavy Vehicles						1				1		1				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						373					306					
Capacity						693					226					
v/c Ratio						0.54					1.35					
95% Queue Length						0.1					16.8					
Control Delay (s/veh)						10.5					227.6					
Level of Service (LOS)						B					F					
Approach Delay (s/veh)					1.5				227.6							
Approach LOS					A				F							

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ			Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.91
Urban Street	Old Henry Road	Analysis Year	2015	Analysis Period	1> 7:30
Intersection	Bush Farm Road	File Name	AM 15.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	5	72	615	4	37	7	115	138	69	604	1

Signal Information					EB		WB			NB			SB		
Cycle, s	82.2	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	30.0	40.0	0.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow	4.3	3.6	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.3	3.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		46.6		46.6		35.6		35.6
Change Period, (Y+R c), s		6.6		6.6		5.6		5.6
Max Allow Headway (MAH), s		4.8		4.7		5.3		5.1
Queue Clearance Time (g s), s		4.3		42.0		13.7		13.1
Green Extension Time (g e), s		0.4		0.0		1.7		4.7
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	3	85		676	45		8	126	152	76	333	33
Adjusted Saturation Flow Rate (s), veh/h/ln	1383	1626		1334	1634		783	1900	1610	1284	1900	181
Queue Service Time (g s), s	0.1	2.3		37.7	1.2		0.6	3.7	5.4	3.5	11.1	11
Cycle Queue Clearance Time (g c), s	1.3	2.3		40.0	1.2		11.7	3.7	5.4	7.2	11.1	11
Green Ratio (g/C)	0.49	0.49		0.49	0.49		0.36	0.36	0.36	0.36	0.36	0.3
Capacity (c), veh/h	740	791		699	795		268	693	588	498	693	69
Volume-to-Capacity Ratio (X)	0.004	0.107		0.967	0.057		0.029	0.182	0.258	0.152	0.480	0.4
Available Capacity (c a), veh/h	740	791		699	795		411	1040	881	733	1040	104
Back of Queue (Q), veh/ln (95 th percentile)	0.1	1.4		24.7	0.7		0.2	2.8	3.5	1.9	8.3	8.
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (d 1), s/veh	11.5	11.4		24.1	11.1		24.6	17.8	18.3	20.2	20.1	20
Incremental Delay (d 2), s/veh	0.0	0.1		26.0	0.0		0.1	0.2	0.3	0.2	0.7	0.
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (d), s/veh	11.5	11.5		50.0	11.2		24.7	17.9	18.6	20.4	20.8	20
Level of Service (LOS)	B	B		D	B		C	B	B	C	C	C
Approach Delay, s/veh / LOS	11.5	B		47.6	D		18.5	B		20.8	C	
Intersection Delay, s/veh / LOS	30.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.6	A	1.7	A	1.0	A	1.1	A

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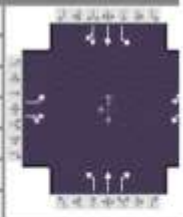
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.91
Urban Street	Old Henry Road	Analysis Year	2021 No Build	Analysis Period	1> 7:30
Intersection	Bush Farm Road	File Name	AM 21 NB.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	15	10	104	833	37	52	171	193	268	129	802	5

Signal Information					EB			WB				NB			SB		
Cycle, s	120.2	Reference Phase	2														
Offset, s	0	Reference Point	End														
Uncoordinated	Yes	Simult. Gap E/W	Off	Green	42.0	66.0	0.0	0.0	0.0	0.0							
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	4.3	3.6	0.0	0.0	0.0	0.0							
				Red	1.3	3.0	0.0	0.0	0.0	0.0							

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		72.6		72.6		47.6		47.6
Change Period, (*Y+R c*), s		6.6		6.6		5.6		5.6
Max Allow Headway (*MAH*), s		4.8		4.8		6.1		5.1
Queue Clearance Time (*g s*), s		6.5		68.0		44.0		27.9
Green Extension Time (*g e*), s		0.7		0.0		0.0		5.7
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		1.00		0.39

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	16	125		915	98		188	212	295	142	473	46
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1318	1632		1286	1719		608	1900	1610	1188	1900	18
Queue Service Time (*g s*), s	0.7	4.5		61.5	3.3		16.1	9.8	17.5	11.9	25.9	25
Cycle Queue Clearance Time (*g c*), s	4.0	4.5		66.0	3.3		42.0	9.8	17.5	21.8	25.9	25
Green Ratio (*g/C*)	0.55	0.55		0.55	0.55		0.35	0.35	0.35	0.35	0.35	0.3
Capacity (*c*), veh/h	748	896		718	944		141	664	563	378	664	65
Volume-to-Capacity Ratio (*X*)	0.022	0.140		1.276	0.104		1.331	0.319	0.523	0.375	0.713	0.7
Available Capacity (*c a*), veh/h	748	896		718	944		141	664	563	378	664	65
Back of Queue (*Q*), veh/ln (95 th percentile)	0.4	3.0		71.1	2.3		20.0	8.0	11.2	6.4	18.2	17
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (*d 1*), s/veh	13.9	13.2		31.9	13.0		55.5	28.6	31.1	36.6	33.9	33
Incremental Delay (*d 2*), s/veh	0.0	0.1		134.7	0.1		189.4	0.4	1.2	0.9	3.9	4.
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (*d*), s/veh	13.9	13.3		166.6	13.0		244.9	29.0	32.3	37.5	37.8	37
Level of Service (LOS)	B	B		F	B		F	C	C	D	D	D
Approach Delay, s/veh / LOS	13.4	B		151.8	F		88.8	F		37.8	D	
Intersection Delay, s/veh / LOS	88.2						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	2.2	B	1.6	A	1.4	A

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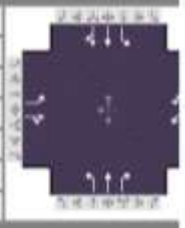
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.91
Urban Street	Old Henry Road	Analysis Year	2021 Build	Analysis Period	1> 7:30
Intersection	Bush Farm Road	File Name	AM 21 B.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	15	10	104	882	37	64	171	193	292	135	802	5

Signal Information			
Cycle, s	120.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	Off
Force Mode	Fixed	Simult. Gap N/S	Off

Green	42.0	66.0	0.0	0.0	0.0	0.0	
Yellow	4.3	3.6	0.0	0.0	0.0	0.0	
Red	1.3	3.0	0.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		72.6		72.6		47.6		47.6
Change Period, (Y+R c), s		6.6		6.6		5.6		5.6
Max Allow Headway (MAH), s		4.8		4.8		6.1		5.1
Queue Clearance Time (g s), s		6.5		68.0		44.0		27.9
Green Extension Time (g e), s		0.7		0.0		0.0		5.7
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		1.00		0.39

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	16	125		969	111		188	212	321	148	473	46
Adjusted Saturation Flow Rate (s), veh/h/ln	1302	1632		1286	1705		608	1900	1610	1188	1900	18
Queue Service Time (g s), s	0.7	4.5		61.5	3.8		16.1	9.8	19.5	12.6	25.9	25
Cycle Queue Clearance Time (g c), s	4.5	4.5		66.0	3.8		42.0	9.8	19.5	22.4	25.9	25
Green Ratio (g/C)	0.55	0.55		0.55	0.55		0.35	0.35	0.35	0.35	0.35	0.3
Capacity (c), veh/h	734	896		718	936		141	664	563	378	664	65
Volume-to-Capacity Ratio (X)	0.022	0.140		1.351	0.119		1.331	0.319	0.570	0.393	0.713	0.7
Available Capacity (c a), veh/h	734	896		718	936		141	664	563	378	664	65
Back of Queue (Q), veh/ln (95 th percentile)	0.4	3.0		82.2	2.6		20.0	8.0	12.3	6.7	18.2	17
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (d 1), s/veh	14.2	13.2		31.9	13.1		55.5	28.6	31.8	36.8	33.9	33
Incremental Delay (d 2), s/veh	0.0	0.1		166.9	0.1		189.4	0.4	1.7	0.9	3.9	4.
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (d), s/veh	14.2	13.3		198.8	13.1		244.9	29.0	33.5	37.8	37.8	37
Level of Service (LOS)	B	B		F	B		F	C	C	D	D	D
Approach Delay, s/veh / LOS	13.4	B		179.8	F		87.3	F		37.8	D	
Intersection Delay, s/veh / LOS	99.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	2.3	B	1.7	A	1.4	A

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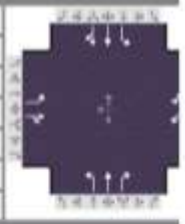
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ			Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.93
Urban Street	Old Henry Road	Analysis Year	2015	Analysis Period	1> 5:00
Intersection	Bush Farm Road	File Name	PM 15.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	4	11	38	351	5	65	60	698	552	83	338	9

Signal Information					EB		WB									
Cycle, s	73.3	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	Off	Green	36.5	24.6	0.0	0.0	0.0	0.0						
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	4.3	3.6	0.0	0.0	0.0	0.0						
				Red	1.3	3.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		31.2		31.2		42.1		42.1
Change Period, (*Y+R c*), s		6.6		6.6		5.6		5.6
Max Allow Headway (*MAH*), s		4.8		4.7		5.2		5.5
Queue Clearance Time (*g s*), s		4.5		22.6		25.9		34.4
Green Extension Time (*g e*), s		0.2		2.0		9.7		2.1
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.01		0.45		0.27

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	4	53		377	75		65	748	594	89	187	18
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1345	1667		1373	1628		1025	1900	1610	725	1900	188
Queue Service Time (*g s*), s	0.2	1.6		19.1	2.4		2.7	23.9	21.4	8.5	4.0	4.
Cycle Queue Clearance Time (*g c*), s	2.5	1.6		20.6	2.4		6.7	23.9	21.4	32.4	4.0	4.
Green Ratio (*g/C*)	0.34	0.34		0.34	0.34		0.50	0.50	0.50	0.50	0.50	0.5
Capacity (*c*), veh/h	506	559		529	546		553	947	802	223	947	93
Volume-to-Capacity Ratio (*X*)	0.009	0.094		0.714	0.138		0.117	0.791	0.740	0.400	0.198	0.1
Available Capacity (*c a*), veh/h	790	911		819	889		673	1168	990	308	1168	115
Back of Queue (*Q*), veh/ln (95 th percentile)	0.1	1.0		10.0	1.5		1.1	14.8	11.7	2.7	2.7	2.
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (*d 1*), s/veh	17.8	16.7		23.8	17.0		12.1	15.2	14.6	28.6	10.2	10
Incremental Delay (*d 2*), s/veh	0.0	0.1		2.2	0.1		0.1	3.5	2.8	1.6	0.1	0.
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (*d*), s/veh	17.9	16.8		26.0	17.1		12.2	18.7	17.4	30.2	10.4	10
Level of Service (LOS)	B	B		C	B		B	B	B	C	B	B
Approach Delay, s/veh / LOS	16.9	B		24.5	C		17.8	B		14.2	B	
Intersection Delay, s/veh / LOS	18.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.2	B	2.2	B
Bicycle LOS Score / LOS	0.6	A	1.2	A	2.8	C	0.9	A

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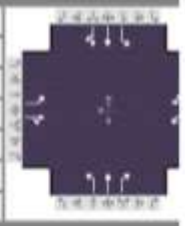
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ			Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.93
Urban Street	Old Henry Road	Analysis Year	2021 No Build	Analysis Period	1> 5:00
Intersection	Bush Farm Road	File Name	PM 21 NB.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	74	40	225	692	12	125	97	877	728	106	475	1

Signal Information					EB		WB			NB			SB		
Cycle, s	102.2	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	45.0	45.0	0.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow	4.3	3.6	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.3	3.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		51.6		51.6		50.6		50.6
Change Period, (*Y+R_c*), s		6.6		6.6		5.6		5.6
Max Allow Headway (*MAH*), s		4.8		5.2		5.2		5.6
Queue Clearance Time (*g_s*), s		14.0		47.0		47.0		47.0
Green Extension Time (*g_e*), s		1.9		0.0		0.0		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	80	285		744	147		104	943	783	114	267	26
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1260	1648		1112	1632		886	1900	1610	604	1900	18
Queue Service Time (*g_s*), s	4.2	12.0		33.0	5.7		8.9	45.0	45.0	0.0	9.4	9.
Cycle Queue Clearance Time (*g_c*), s	9.9	12.0		45.0	5.7		18.3	45.0	45.0	45.0	9.4	9.
Green Ratio (*g/C*)	0.44	0.44		0.44	0.44		0.44	0.44	0.44	0.44	0.44	0.4
Capacity (*c*), veh/h	555	726		430	719		379	837	709	70	837	82
Volume-to-Capacity Ratio (*X*)	0.143	0.393		1.731	0.205		0.275	1.127	1.104	1.618	0.319	0.3
Available Capacity (*c_a*), veh/h	555	726		430	719		379	837	709	70	837	82
Back of Queue (*Q*), veh/ln (95 th percentile)	2.2	8.0		83.4	3.8		3.4	49.9	40.8	15.0	7.3	7.
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (*d₁*), s/veh	20.6	19.4		37.3	17.6		24.6	28.6	28.6	51.1	18.6	18
Incremental Delay (*d₂*), s/veh	0.1	0.4		338.6	0.2		0.6	72.3	66.0	333.8	0.3	0.
Initial Queue Delay (*d₃*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (*d*), s/veh	20.8	19.8		375.9	17.8		25.1	100.9	94.6	384.9	18.9	18
Level of Service (LOS)	C	B		F	B		C	F	F	F	B	B
Approach Delay, s/veh / LOS	20.0	B		316.7	F		93.9	F		83.6	F	
Intersection Delay, s/veh / LOS	138.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	1.1	A	2.0	A	3.5	D	1.0	A

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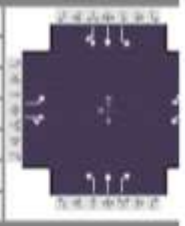
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ			Duration, h	0.25
Analyst	DBZ	Analysis Date	Feb 28, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.93
Urban Street	Old Henry Road	Analysis Year	2021 Build	Analysis Period	1> 5:00
Intersection	Bush Farm Road	File Name	PM 21 B.xus		
Project Description	Sutherland Pointe				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	74	40	225	737	12	136	97	877	804	125	475	1

Signal Information					EB		WB			NB			SB		
Cycle, s	102.2	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	45.0	45.0	0.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow	4.3	3.6	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.3	3.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		6.0
Phase Duration, s		51.6		51.6		50.6		50.6
Change Period, (*Y+R_c*), s		6.6		6.6		5.6		5.6
Max Allow Headway (*MAH*), s		4.8		5.2		5.2		5.7
Queue Clearance Time (*g_s*), s		14.0		47.0		47.0		47.0
Green Extension Time (*g_e*), s		1.9		0.0		0.0		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	80	285		792	159		104	943	865	134	267	26
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1247	1648		1112	1630		886	1900	1610	604	1900	18
Queue Service Time (*g_s*), s	4.3	12.0		33.0	6.2		8.9	45.0	45.0	0.0	9.4	9.
Cycle Queue Clearance Time (*g_c*), s	10.5	12.0		45.0	6.2		18.3	45.0	45.0	45.0	9.4	9.
Green Ratio (*g/C*)	0.44	0.44		0.44	0.44		0.44	0.44	0.44	0.44	0.44	0.4
Capacity (*c*), veh/h	544	726		430	718		379	837	709	70	837	82
Volume-to-Capacity Ratio (*X*)	0.146	0.393		1.844	0.222		0.275	1.127	1.219	1.908	0.319	0.3
Available Capacity (*c_a*), veh/h	544	726		430	718		379	837	709	70	837	82
Back of Queue (*Q*), veh/ln (95 th percentile)	2.3	8.0		93.7	4.1		3.4	49.9	55.2	19.3	7.3	7.
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (*d₁*), s/veh	21.0	19.4		37.3	17.7		24.6	28.6	28.6	51.1	18.6	18
Incremental Delay (*d₂*), s/veh	0.1	0.4		388.6	0.2		0.6	72.3	111.2	456.6	0.3	0.
Initial Queue Delay (*d₃*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (*d*), s/veh	21.1	19.8		425.9	17.9		25.1	100.9	139.8	507.7	18.9	18
Level of Service (LOS)	C	B		F	B		C	F	F	F	B	B
Approach Delay, s/veh / LOS	20.1	C		357.6	F		114.4	F		117.6	F	
Intersection Delay, s/veh / LOS	165.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.4	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	1.1	A	2.1	B	3.6	D	1.0	A

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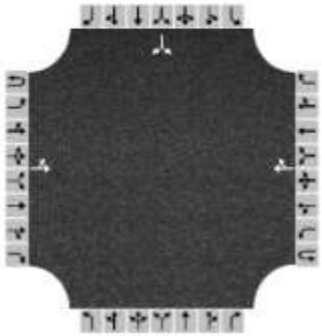
HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Sutherland Point
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Sutherland Pointe Entranc
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		LT						TR							LR	
Volume (veh/h)		9	219				574	2						7		27
Percent Heavy Vehicles		1												1		1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

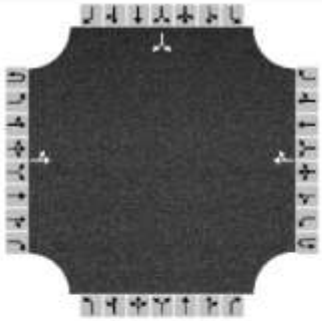
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		275													41	
Capacity		906													397	
v/c Ratio		0.30													0.10	
95% Queue Length		0.0													0.3	
Control Delay (s/veh)		9.0													15.1	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.5												15.1			
Approach LOS	A												C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DBZ	Intersection	Aiken at Sutherland Point
Agency/Co.	DBZ	Jurisdiction	
Date Performed	2/28/2016	East/West Street	Aiken Road
Analysis Year	2021	North/South Street	Sutherland Pointe Entranc
Time Analyzed	PM Peak	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sutherland Pointe		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		LT						TR							LR	
Volume (veh/h)		30	579				314	7						4		18
Percent Heavy Vehicles		1												1		1
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		634													23	
Capacity		1231													552	
v/c Ratio		0.52													0.04	
95% Queue Length		0.1													0.1	
Control Delay (s/veh)		8.0													11.8	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.7												11.8			
Approach LOS	A												B			

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