

final report

January 8, 2024

Traffic Impact Study

*Oak Pointe
Dawn Drive
Louisville, KY*

Prepared for

Louisville Metro Planning Commission

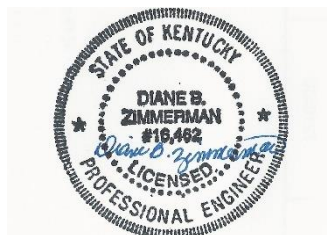


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INTRODUCTION

The development plan for a residential community on Dawn Drive in Louisville, KY shows 368 apartments, 16 single family detached lots, and 22 single family attached lots. **Figure 1** displays a map of the site. Access to the community will be from an entrance on Dawn Drive with an emergency access drive also on Dawn Drive. 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 to be the intersections of Meyers Lane with Dixie Highway and Dawn Drive with Christie Avenue and the proposed entrance.

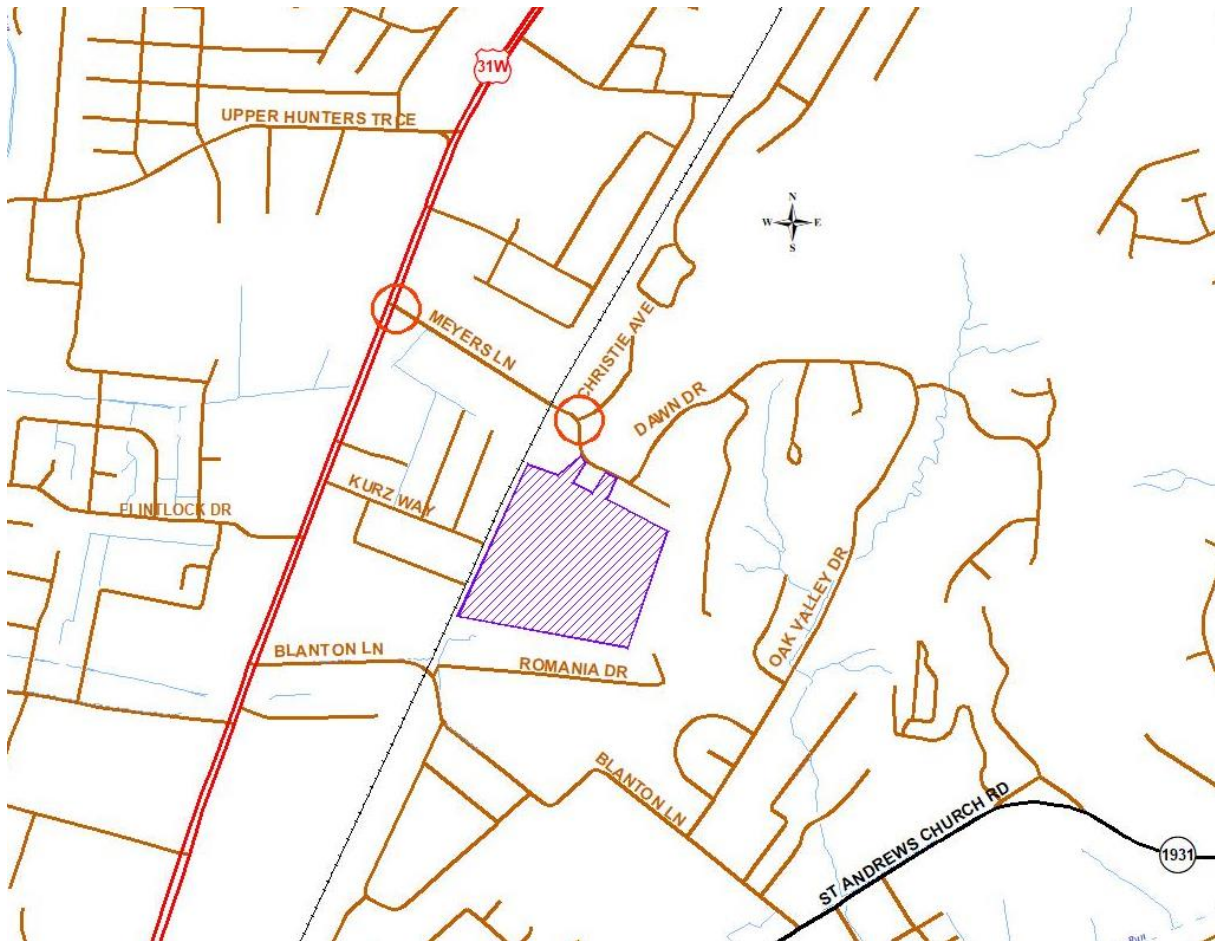


Figure 1. Site Map

EXISTING CONDITIONS

Dawn Drive is maintained Louisville Metro with an estimated 2023 ADT of 1,100 vehicles per day east of Christie Avenue as estimated from the turning movement count and applying the K factor of 12.9 from Kentucky Transportation Cabinet count at station S84. The road is a two-lane highway with eleven-foot lanes with no shoulders through the study area. The speed limit is 25 mph. There are no sidewalks. The intersection with Christie Avenue is controlled with a stop sign on Christie Avenue. Dawn Drive becomes Meyers Lane west of the railroad track. The intersection with Dixie Highway is controlled with a traffic signal. At the intersection Meyers Lane has a shared left/thru lane and a right turn lane. There are dedicated left/U-turn lanes on Dixie Highway.

Peak hour traffic count for the intersections were obtained on Wednesday, December 6, 2023. The a.m. peak was 7:15 to 8:15 and the p.m. peak hour was 5:00 to 6:00. Because of Holy Cross school, the peak at Dixie Highway occurred at 7:45 a.m. and 4:00 p.m. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.

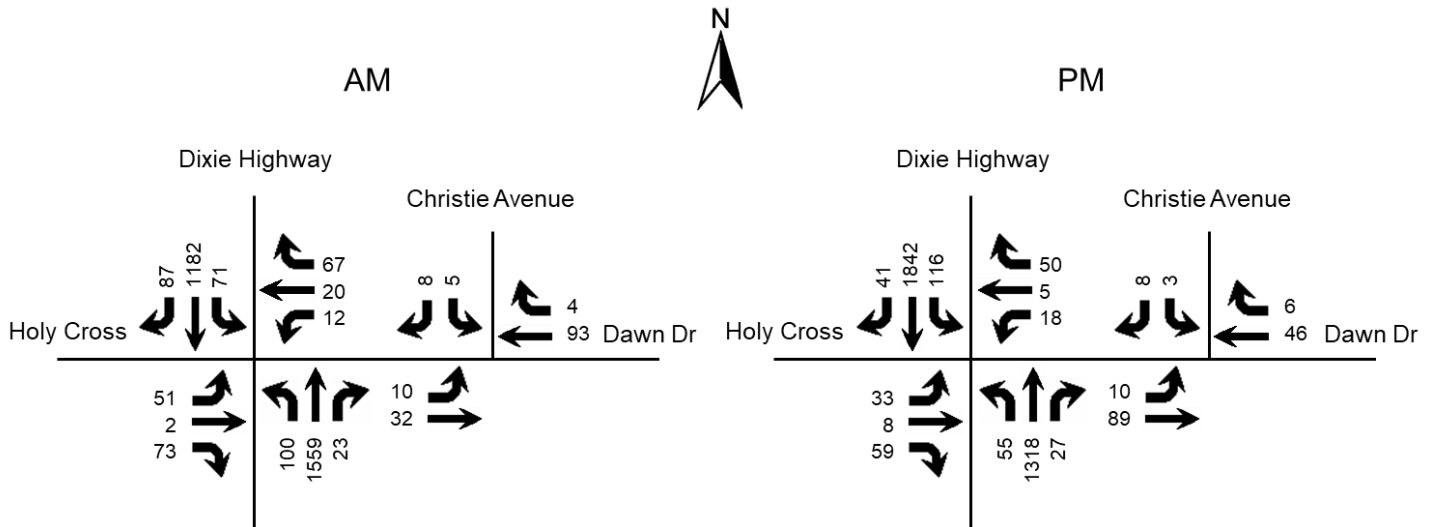


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The projected completion year for this development is 2028. Volumes were increased by 0.2 percent annual growth based upon a review of KYTC station 679, 657, and 680. **Figure 3** illustrates the 2028 traffic volumes without the development.

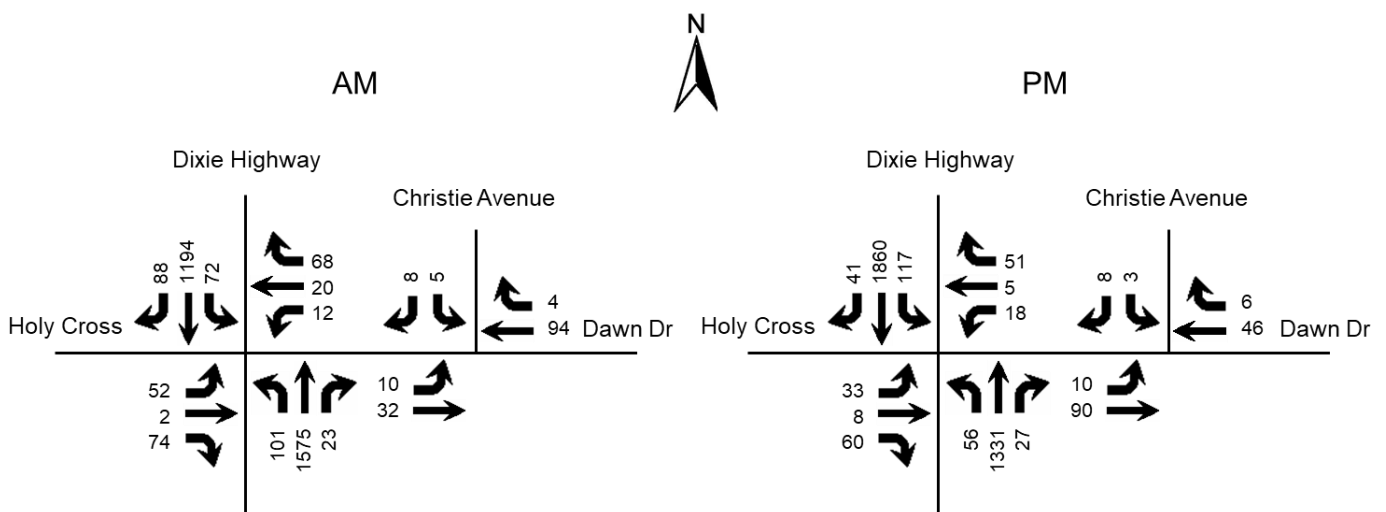


Figure 3. 2028 Peak Hour No Build Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 11th Edition contains trip generation rates for a wide range of developments. The land uses of “Multifamily Housing Low-Rise (220)”, “Single Family Detached Housing (210)”, and “Single-Family Attached (215)” were reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. Trips were assigned to the entrances with 40% of the apartments using the west entrance. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed.

Table 1. Peak Hour Trips Generated by Site

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trips	In	Out	Trips	In	Out
Multifamily Housing Low-Rise (368 units)	137	33	104	179	113	66
Single-Family Detached Housing (16 units)	14	3	11	18	11	7
Single-Family Attached Housing (22 units)	6	1	5	9	5	4
TOTAL	157	37	120	206	129	77

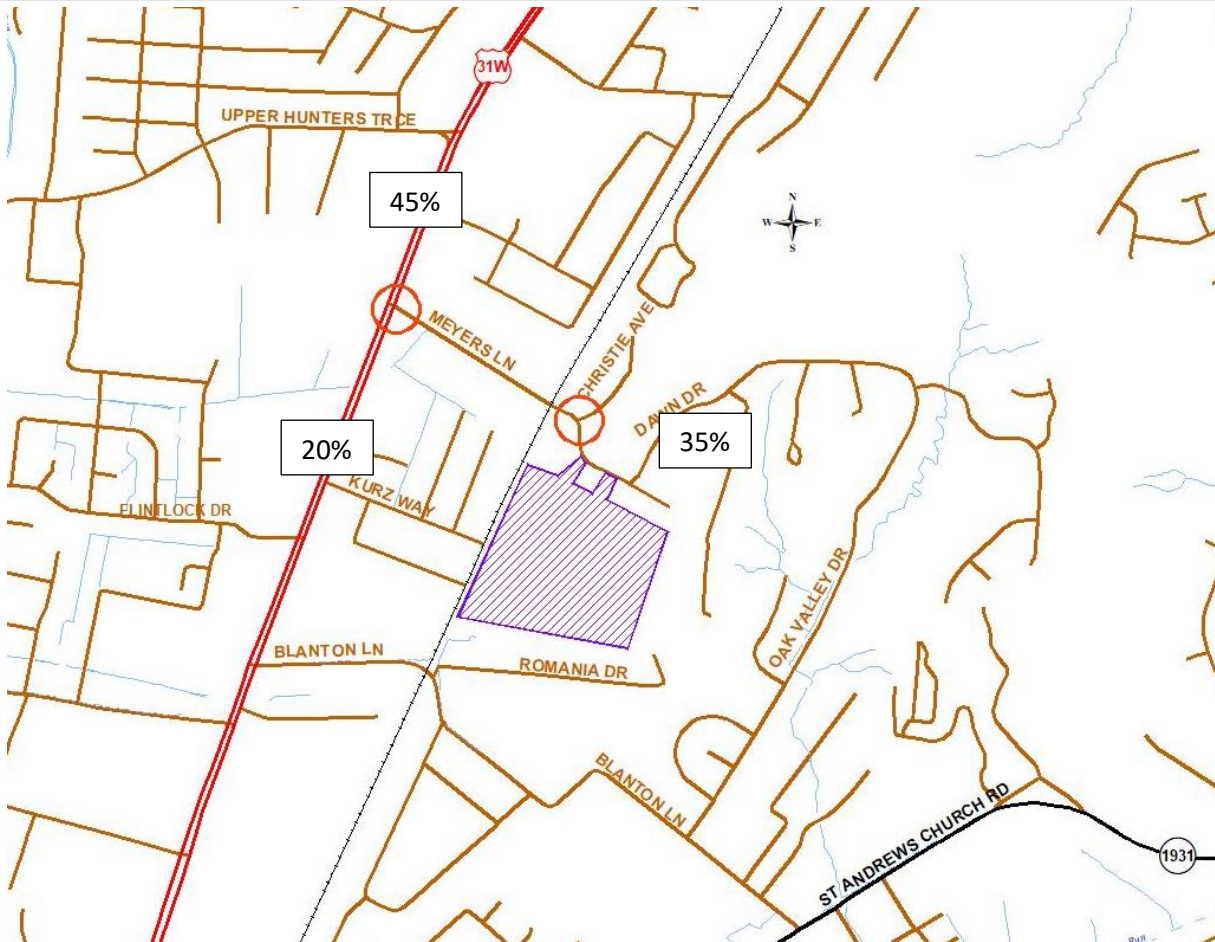


Figure 4. Trip Distribution Percentages

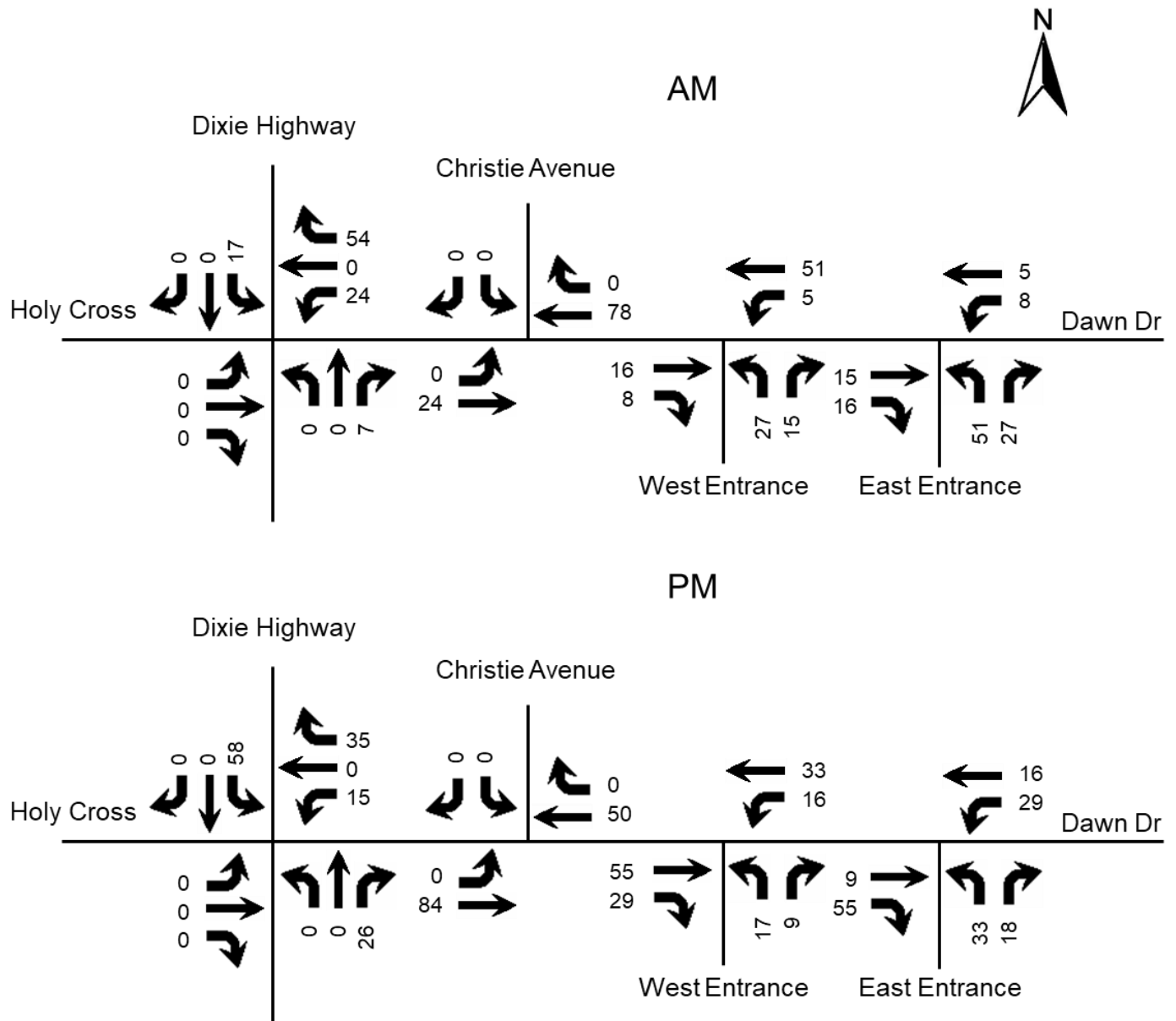
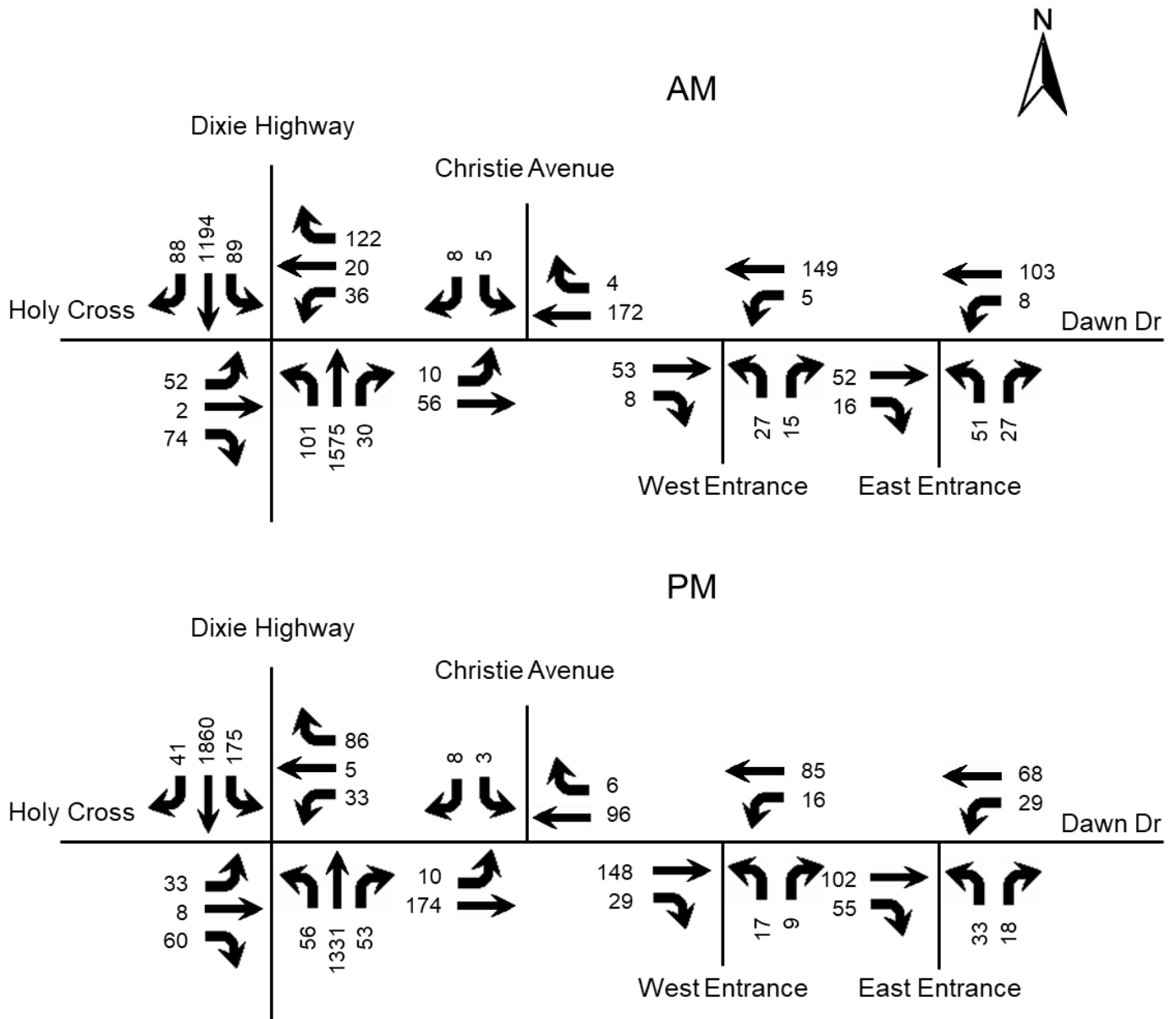


Figure 5. Peak Hour Trips Generated by Site



ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a “Level of Service”. Level of Service is a ranking scale from A through F, “A” is the best operating condition and “F” is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 7th edition. Future delays and Level of Service were determined

for the intersections using the HCS Streets and TWSC (version 2023) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Peak Hour Level of Service

	A.M.			P.M.		
Approach	2023 Existing	2028 No Build	2028 Build	2023 Existing	2028 No Build	2028 Build
Dixie Highway at Meyers Lane	B 11.4	B 11.5	B 14.0	A 9.9	A 10.0	B 12.4
Holy Cross Eastbound	E 64.0	E 64.0	E 59.3	E 71.7	E 71.6	E 69.6
Meyers Lane Westbound	E 63.8	E 63.7	E 60.2	E 66.4	E 66.3	E 62.5
Dixie Highway Northbound	A 4.8	A 4.8	A 6.1	A 9.9	A 9.9	B 12.6
Dixie Highway Southbound	B 11.0	B 11.1	B 13.5	A 4.8	A 4.8	A 6.5
Dawn Drive at Christie Avenue						
Dawn Drive Eastbound (left)	A 7.8	A 7.8	A 8.0	A 7.3	A 7.3	A 7.5
Christie Avenue Southbound	A 9.3	A 9.3	A 10.0	A 9.1	A 9.1	A 9.7
Dawn Drive at West Entrance						
Dawn Drive Westbound (left)			A 7.3			A 7.7
Entrance Northbound			A 9.8			B 10.3
Dawn Drive at East Entrance						
Dawn Drive Westbound (left)			A 7.4			A 7.6
Entrance Northbound			A 9.8			B 10.3

Key: Level of Service, Delay in seconds per vehicle

The entrances on Dawn Drive were evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated July, 2020. The volumes in Figure 6 were utilized to determine turn lane requirements. Neither entrance meets the volume warrant for turn lanes.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2028, there will be an impact to the existing highway network, with Levels of Service remaining within acceptable ranges. The volume warrant is not met for the entrances on Dawn Drive. No improvements are required.

APPENDIX

Planning & Design



Traffic Counts

Classified Turn Movement Count || All vehicles

Louisville, KY



www.marrtraffic.com

Site 1

US-60 Dixie Hwy (South)
US-60 Dixie Hwy (North)
Holy Cross High School
Meyers Ln



Date

Wednesday, December 6, 2023

Lat/Long

38.164801°, -85.830366°

[Click here for Map](#)

Weather

Cloudy

41°F

[Click here for Detailed Weather](#)



0700 - 0900 (Weekday 2h Session) (12-06-2023)

All vehicles

TIME	Northbound						Southbound						Eastbound						Westbound					
	US-60 Dixie Hwy (South)						US-60 Dixie Hwy (North)						Holy Cross High School						Meyers Ln					
	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total
	1.1	1.2	1.3	1.4			1.5	1.6	1.7	1.8			1.9	1.10	1.11	1.12			1.13	1.14	1.15	1.16		
0700 - 0715	1	401	4	1	407	4	187	9		0	200	3	1	9		0	13	2	0	18		0	20	640
0715 - 0730	11	459	4	0	474	9	230	13		0	252	11	0	1		0	12	4	2	30		0	36	774
0730 - 0745	8	434	2	3	447	16	298	11		1	326	11	0	8		0	19	2	1	33		0	36	828
0745 - 0800	7	380	8	3	398	18	380	12		4	414	11	1	8		0	20	2	4	9		0	15	847
Hourly Total	27	1674	18	7	1726	47	1095	45		5	1192	36	2	26		0	64	10	7	90		0	107	3089
0800 - 0815	9	402	1	5	417	14	256	7		2	279	2	0	7		0	9	3	3	21		0	27	732
0815 - 0830	21	398	5	5	429	10	284	26		4	324	14	0	16		0	30	5	4	17		0	26	809
0830 - 0845	46	379	9	4	438	8	262	42		11	323	24	1	42		0	67	2	9	20		0	31	859
0845 - 0900	9	368	4	0	381	5	360	13		15	393	14	1	15		0	30	4	2	12		0	18	822
Hourly Total	85	1547	19	14	1665	37	1162	88		32	1319	54	2	80		0	136	14	18	70		0	102	3222
Grand Total	112	3221	37	21	3391	84	2257	133		37	2511	90	4	106		0	200	24	25	160		0	209	6311
Approach %	3.30	94.99	1.09	0.62	-	3.35	89.88	5.30		1.47	-	45.00	2.00	53.00		0.00	-	11.48	11.96	76.56		0.00	-	
Intersection %	1.77	51.04	0.59	0.33	53.73	1.33	35.76	2.11		0.59	39.79	1.43	0.06	1.68		0.00	3.17	0.38	0.40	2.54		0.00	3.31	
Heavy Vehicle %	0	3	16	0	3	8	5	1		0	4	2	0	0		-	1	8	0	2		-	2	3
PHF	0.45	0.97	0.64	0.85	0.96	0.69	0.78	0.52		0.48	0.81	0.53	0.50	0.43		0.00	0.47	0.60	0.56	0.80		0.00	0.80	0.94

1500 - 1800 (Weekday 3h Session) (12-06-2023)

All vehicles

TIME	Northbound						Southbound						Eastbound						Westbound					
	US-60 Dixie Hwy (South)						US-60 Dixie Hwy (North)						Holy Cross High School						Meyers Ln					
	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total	Left	Thru	Right	U-Turn	App	Total
	1.1	1.2	1.3	1.4			1.5	1.6	1.7	1.8			1.9	1.10	1.11	1.12			1.13	1.14	1.15	1.16		
1500 - 1515	16	388	7	9	420	26	421	24		6	477	32	3	63		0	98	8	0	9		0	17	1012
1515 - 1530	11	346	5	6	368	15	450	13		18	496	13	7	16		0	36	4	2	15		0	21	921
1530 - 1545	8	429	7	11	455	16	400	6		7	429	14	2	19		0	35	2	0	14		0	16	935
1545 - 1600	12	369	5	4	390	14	370	10		13	407	14	1	9		0	24	8	4	7		0	19	840
Hourly Total	47	1532	24	30	1633	71	1641	53		44	1809	73	13	107		0	193	22	6	45		0	73	3708
1600 - 1615	10	352	5	3	370	16	431	11		8	466	10	4	25		0	39	5	2	17		0	24	899
1615 - 1630	3	340	2	17	362	19	447	11		10	487	8	1	7		0	16	4	0	15		0	19	884
1630 - 1645	3	338	7	8	356	17	477	8		19	521	7	1	14		0	22	3	2	5		0	10	909
1645 - 1700	6	288	13	5	312	15	487	11		12	525	8	2	13		0	23	6	1	13		0	20	880
Hourly Total	22	1318	27	33	1400	67	1842	41		49	1999	33	8	59		0	100	18	5	50		0	73	3572
1700 - 1715	7	263	6	5	281	23	467	7		17	514	5	3	7		0	15	5	1	9		0	15	825
1715 - 1730	3	347	7	6	363	17	430	7		8	462	15	1	5		0	21	2	2	9		0	13	859
1730 - 1745	5	381	6	11	403	27	456	4		9	496	7	0	11		0	18	5	1	12		0	18	935
1745 - 1800	11	272	3	11	297	19	380	10		5	414	4	1	6		0	11	4	1	12		0	17	739
Hourly Total	26	1263	22	33	1344	86	1733	28		39	1886	31	5	29		0	65	16	5	42		0	63	3358
Grand Total	95	4113	73	96	4377	224	5216	122		132	5694	137	26	195		0	358	56	16	137		0	209	10638
Approach %	2.17	93.97	1.67	2.19	-	3.93	91.61	2.14		2.32	-	38.27	7.26	54.47		0.00	-	26.79	7.66	65.55		0.00	-	
Intersection %	0.89	38.66	0.69	0.90	41.14	2.11	49.03	1.15		1.24	53.53	1.29	0.24	1.83		0.00	3.37	0.53	0.15	1.29		0.00	1.96	
Heavy Vehicle %	1	3	3	0	3	4	2	0		0	2	0	0	0		-	0	5	0	2		-	3	2
PHF	0.55	0.94	0.52	0.49	0.95	0.88	0.95	0.93		0.64	0.95	0.83	0.50	0.59		0.00	0.64	0.75	0.63	0.74		0.00	0.76	0.98

Oak Pointe Traffic Impact Study

Classified Turn Movement Count || All vehicles

Louisville, KY



Site 2

Dawn Dr



Date

Wednesday, December 6, 2023

Weather

Cloudy

41°F

[Click here for Detailed Weather](#)

Meyers Ln
Christie Ave

Lat/Long

38.162495°, -85.825320°

[Click here for Map](#)



0700 - 0900 (Weekday 2h Session) (12-06-2023)

All vehicles

Northbound				
Dawn Dr				
TIME	Left 2.1	Right 2.2	U-Turn 2.3	App Total
0700 - 0715	11	0	0	11
0715 - 0730	28	1	0	29
0730 - 0745	28	1	0	29
0745 - 0800	14	2	0	16
Hourly Total	81	4	0	85
0800 - 0815	23	0	0	23
0815 - 0830	21	1	1	23
0830 - 0845	25	0	0	25
0845 - 0900	20	1	0	21
Hourly Total	89	2	1	92
Grand Total	170	6	1	177
Approach %	96.05	3.39	0.56	-
Intersection %	59.65	2.11	0.35	62.11
Heavy Vehicle %	2	17	0	2
PHF	0.83	0.50	0.00	0.84

Eastbound				Westbound			
Meyers Ln				Christie Ave			
Thru 2.4	Right 2.5	U-Turn 2.6	App Total	Left 2.7	Thru 2.8	U-Turn 2.9	App Total
2	3	0	5	2	6	0	8
4	7	0	11	2	4	0	6
2	6	0	8	0	3	0	3
1	14	0	15	0	0	0	0
9	30	0	39	4	13	0	17
3	5	0	8	3	1	0	4
2	12	0	14	1	2	0	3
2	9	0	11	0	3	0	3
1	7	0	8	1	0	0	1
8	33	0	41	5	6	0	11
17	63	0	80	9	19	0	28
21.25	78.75	0.00	-	32.14	67.86	0.00	-
5.96	22.11	0.00	28.07	3.16	6.67	0.00	9.82
41	8	-	15	22	11	-	14
0.63	0.57	0.00	0.70	0.42	0.50	0.00	0.54
							0.83

1500 - 1800 (Weekday 3h Session) (12-06-2023)

All vehicles

Northbound				
Dawn Dr				
TIME	Left 2.1	Right 2.2	U-Turn 2.3	App Total
1500 - 1515	11	0	0	11
1515 - 1530	7	1	0	8
1530 - 1545	16	2	0	18
1545 - 1600	15	0	0	15
Hourly Total	49	3	0	52
1600 - 1615	21	0	0	21
1615 - 1630	15	1	0	16
1630 - 1645	10	0	0	10
1645 - 1700	10	1	0	11
Hourly Total	56	2	0	58
1700 - 1715	13	0	0	13
1715 - 1730	9	2	0	11
1730 - 1745	12	4	0	16
1745 - 1800	12	0	0	12
Hourly Total	46	6	0	52
Grand Total	151	11	0	162
Approach %	93.21	6.79	0.00	-
Intersection %	32.61	2.38	0.00	34.99
Heavy Vehicle %	3	27	-	4
PHF	0.88	0.38	0.00	0.81

Eastbound				Westbound			
Meyers Ln				Christie Ave			
Thru 2.4	Right 2.5	U-Turn 2.6	App Total	Left 2.7	Thru 2.8	U-Turn 2.9	App Total
2	25	0	27	1	3	0	4
2	18	0	20	1	3	0	4
1	24	0	25	2	1	0	3
0	14	0	14	1	0	0	1
5	81	0	86	5	7	0	12
3	21	0	24	1	0	0	1
2	18	0	20	1	1	0	2
3	17	0	20	0	1	0	1
1	22	0	23	2	0	0	2
9	78	0	87	4	2	0	6
1	27	0	28	0	1	0	1
2	18	0	20	1	2	0	3
5	25	0	30	1	1	0	2
2	19	0	21	1	4	0	5
10	89	0	99	3	8	0	11
24	248	0	272	12	17	0	29
8.82	91.18	0.00	-	41.38	58.62	0.00	-
5.18	53.56	0.00	58.75	2.59	3.67	0.00	6.26
4	4	-	4	33	12	-	21
0.50	0.82	0.00	0.83	0.75	0.50	0.00	0.55
							0.84



TIS Simplified Traffic Forecast

Count Year	2023	Number of Counts	8
Opening Year	2028		
Design Year	2038	Growth Rate	-0.47%
Years Back	15		

* 2020 Counts not included in calculation

KYTC Traffic Count Station #1

STA ID	056679
Paste Count Data Here	
2023	
2022	
2021	
2020	
2019	
2018	10080
2017	
2016	
2015	9710
2014	
2013	
2012	10151
2011	
2010	
2009	10400
2008	
2007	
2006	10100
2005	
2004	
2003	11700
2002	
2001	
2000	12200
1999	
1998	
1997	
1996	

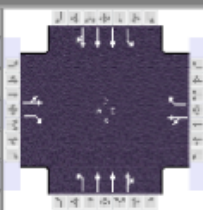
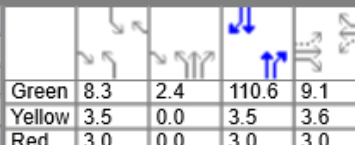
KYTC Traffic Count Station #2

STA ID	056657
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2023	
2022	
2021	
2020	*38853
2019	
2018	
2017	47194
2016	
2015	
2014	
2013	
2012	
2011	
2010	
2009	
2008	
2007	52500
2006	50700
2005	50700
2004	55500
2003	49800
2002	51800
2001	
2000	
1999	
1998	61800
1997	53600
1996	

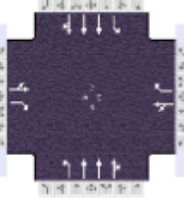
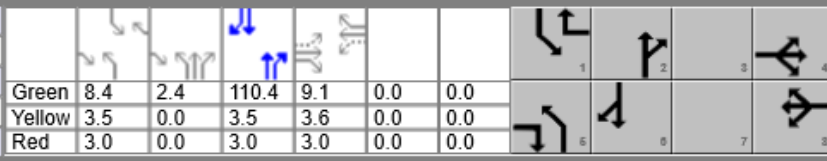
KYTC Traffic Count Station #3

STA ID	056680
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2023	
2022	
2021	
2020	*24135
2019	
2018	
2017	
2016	
2015	27400
2014	18958
2013	
2012	26927
2011	
2010	
2009	
2008	
2007	
2006	
2005	30100
2004	33600
2003	40300
2002	
2001	
2000	
1999	
1998	36800
1997	
1996	

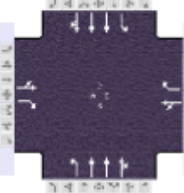
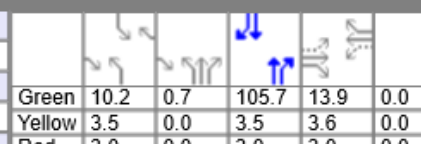
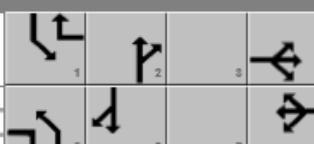
HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		AM		PHF		0.94									
Urban Street		Dixie Highway		Analysis Year		2023		Analysis Period		1> 7:45									
Intersection		Meyers Lane		File Name		Am23.xus													
Project Description		Oak 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				51	2	73	12	20	67	100	1559	23	71	1182	87				
Signal Information																			
Cycle, s	150.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	8.3	2.4	110.6	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
				Yellow	3.5	0.0	3.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
				Red	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						15.7				15.7		17.2		119.5		14.8		117.1	
Change Period, (Y+R _c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time (g _s), s						8.6				8.2		10.7				8.5			
Green Extension Time (g _e), s						0.5				0.5		0.2		0.0		0.1		0.0	
Phase Call Probability						1.00				1.00		0.99				0.96			
Max Out Probability						0.00				0.00		0.00				0.00			
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					56	78		34	71	106	1125	558	76	911	439				
Adjusted Saturation Flow Rate (s), veh/h/ln					1382	1610		1652	1585	1810	1856	1841	1711	1826	1759				
Queue Service Time (g _s), s					3.3	6.6		0.0	6.2	8.7	0.0	0.0	6.5	13.1	13.1				
Cycle Queue Clearance Time (g _c), s					6.0	6.6		2.7	6.2	8.7	0.0	0.0	6.5	13.1	13.1				
Green Ratio (g/C)					0.06	0.13		0.06	0.12	0.07	0.75	0.75	0.06	0.74	0.74				
Capacity (c), veh/h					130	212		133	183	129	2797	1387	95	2693	1297				
Volume-to-Capacity Ratio (X)					0.432	0.366		0.257	0.389	0.823	0.402	0.402	0.798	0.338	0.338				
Back of Queue (Q), ft/ln (95 th percentile)					99.7	122.4		60.6	116.3	183.9	7.7	15.1	143.2	220.8	210.8				
Back of Queue (Q), veh/ln (95 th percentile)					3.9	4.9		2.3	4.6	7.4	0.3	0.6	5.4	8.5	8.4				
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	0.00				
Uniform Delay (d ₁), s/veh					69.0	59.4		67.5	61.4	66.9	0.0	0.0	70.0	6.9	6.9				
Incremental Delay (d ₂), s/veh					0.8	0.4		0.4	0.5	4.9	0.4	0.9	5.7	0.3	0.7				
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	0.0				
Control Delay (d), s/veh					69.9	59.8		67.9	61.9	71.8	0.4	0.9	75.7	7.2	7.6				
Level of Service (LOS)					E	E		E	E	E	A	A	E	A	A				
Approach Delay, s/veh / LOS				64.0	E		63.8	E		4.8	A		11.0	B					
Intersection Delay, s/veh / LOS				11.4 B															
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62	C		2.62	C		1.86	B		1.86	B					
Bicycle LOS Score / LOS				0.71	A		0.66	A		1.47	A		1.27	A					

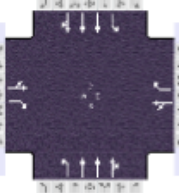
HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		AM		PHF		0.94									
Urban Street		Dixie Highway		Analysis Year		2028 No Build		Analysis Period		1> 7:45									
Intersection		Meyers Lane		File Name		Am 28 NB.xus													
Project Description		Oak 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				52	2	74	12	20	68	101	1575	23	72	1194	88				
Signal Information																			
Cycle, s	150.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	8.4	2.4	110.4	9.1	0.0	0.0	0.0	0.0	0.0	0.0					
				Yellow	3.5	0.0	3.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0					
				Red	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0					
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						15.7				15.7		17.3		119.3		14.9		116.9	
Change Period, (Y+R c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time (g s), s						8.7				8.3		10.7				8.6			
Green Extension Time (g e), s						0.5				0.5		0.2		0.0		0.1		0.0	
Phase Call Probability						1.00				1.00		0.99				0.96			
Max Out Probability						0.00				0.00		0.00				0.00			
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					57	79		34	72	107	1136	564	77	920	443				
Adjusted Saturation Flow Rate (s), veh/h/ln					1382	1610		1651	1585	1810	1856	1841	1711	1826	1759				
Queue Service Time (g s), s					3.4	6.7		0.0	6.3	8.7	0.0	0.0	6.6	13.3	13.3				
Cycle Queue Clearance Time (g c), s					6.1	6.7		2.7	6.3	8.7	0.0	0.0	6.6	13.3	13.3				
Green Ratio (g/C)					0.06	0.13		0.06	0.12	0.07	0.75	0.75	0.06	0.74	0.74				
Capacity (c), veh/h					131	214		134	185	130	2792	1385	96	2689	1295				
Volume-to-Capacity Ratio (X)					0.437	0.368		0.255	0.390	0.824	0.407	0.407	0.799	0.342	0.342				
Back of Queue (Q), ft/ln (95 th percentile)					101.6	124		60.5	117.8	185.6	7.9	15.4	145.1	224.5	214.2				
Back of Queue (Q), veh/ln (95 th percentile)					3.9	5.0		2.3	4.6	7.4	0.3	0.6	5.5	8.6	8.6				
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	0.00				
Uniform Delay (d 1), s/veh					69.0	59.3		67.4	61.3	66.9	0.0	0.0	70.0	7.0	7.0				
Incremental Delay (d 2), s/veh					0.9	0.4		0.4	0.5	4.9	0.4	0.9	5.6	0.3	0.7				
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	0.0				
Control Delay (d), s/veh					69.9	59.7		67.8	61.8	71.7	0.4	0.9	75.6	7.3	7.7				
Level of Service (LOS)					E	E		E	E	E	A	A	E	A	A				
Approach Delay, s/veh / LOS				64.0		E	63.7		E	4.8		A	11.1		B				
Intersection Delay, s/veh / LOS				11.5						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62		C	2.62		C	1.86		B	1.86		B				
Bicycle LOS Score / LOS				0.71		A	0.66		A	1.48		A	1.28		A				

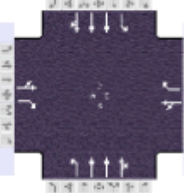
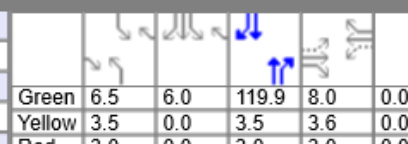
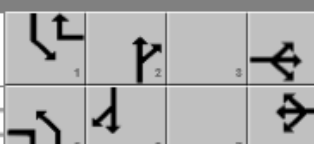
HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		AM		PHF		0.94									
Urban Street		Dixie Highway		Analysis Year		2028 Build		Analysis Period		1> 7:45									
Intersection		Meyers Lane		File Name		Am 28 B.xus													
Project Description		Oak 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				52	2	74	36	20	122	101	1575	30	89	1194	88				
Signal Information																			
Cycle, s	150.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode				Fixed	Simult. Gap N/S	On	Red	3.0	0.0	3.0	3.0	0.0	0.0						
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						20.5				20.5		17.3		112.9		16.7		112.2	
Change Period, (Y+R c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time (g s), s						8.4				13.2		10.7				10.2			
Green Extension Time (g e), s						0.6				0.6		0.2		0.0		0.2		0.0	
Phase Call Probability						1.00				1.00		0.99				0.98			
Max Out Probability						0.00				0.00		0.00				0.00			
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					57	79		60	130	107	1142	565	95	920	443				
Adjusted Saturation Flow Rate (s), veh/h/ln					1384	1610		1500	1585	1810	1856	1837	1711	1826	1759				
Queue Service Time (g s), s					0.4	6.4		0.0	11.2	8.7	4.2	4.3	8.2	14.9	14.9				
Cycle Queue Clearance Time (g c), s					5.9	6.4		5.5	11.2	8.7	4.2	4.3	8.2	14.9	14.9				
Green Ratio (g/C)					0.09	0.16		0.09	0.16	0.64	0.71	0.71	0.64	0.70	0.70				
Capacity (c), veh/h					175	265		178	254	130	2632	1303	116	2574	1240				
Volume-to-Capacity Ratio (X)					0.328	0.297		0.335	0.512	0.824	0.434	0.434	0.817	0.358	0.358				
Back of Queue (Q), ft/ln (95 th percentile)					97.5	118.8		104	204.4	185.6	55.8	62.6	178.2	253.1	241.1				
Back of Queue (Q), veh/ln (95 th percentile)					3.8	4.8		3.9	8.0	7.4	2.2	2.5	6.8	9.7	9.6				
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	0.00				
Uniform Delay (d 1), s/veh					64.4	55.1		64.2	57.6	66.9	1.3	1.3	69.0	8.7	8.7				
Incremental Delay (d 2), s/veh					0.4	0.2		0.4	0.6	4.9	0.5	1.1	5.2	0.4	0.8				
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	0.0				
Control Delay (d), s/veh					64.8	55.3		64.6	58.2	71.8	1.8	2.4	74.3	9.1	9.5				
Level of Service (LOS)					E	E		E	E	E	A	A	E	A	A				
Approach Delay, s/veh / LOS				59.3	E		60.2	E		6.1	A		13.5	B					
Intersection Delay, s/veh / LOS				14.0						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62	C		2.62	C		1.87	B		1.87	B					
Bicycle LOS Score / LOS				0.71	A		0.80	A		1.49	A		1.29	A					

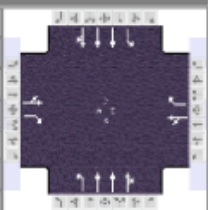
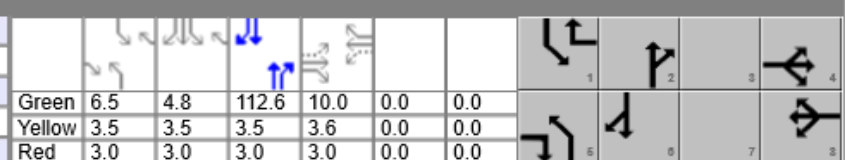
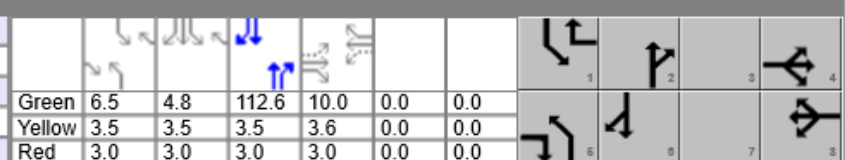
HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		PM		PHF		0.98									
Urban Street		Dixie Highway		Analysis Year		2023		Analysis Period		1> 4:00									
Intersection		Meyers Lane		File Name		PM 23.xus													
Project Description		Oak 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				33	8	59	18	5	50	55	1318	27	116	1842	41				
Signal Information																			
Cycle, s	160.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	On	Green	6.4	6.0	120.0	8.0	0.0	0.0									
				Yellow	3.5	0.0	3.5	3.6	0.0	0.0									
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	0.0	3.0	3.0	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						14.6				14.6		12.9		126.5		18.9		132.5	
Change Period, (Y+R c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.2				3.2		3.1		0.0		3.1		0.0	
Queue Clearance Time (g s), s						7.7				6.6		6.9				12.3			
Green Extension Time (g e), s						0.3				0.3		0.1		0.0		0.2		0.0	
Phase Call Probability						1.00				1.00		0.92				0.99			
Max Out Probability						0.00				0.00		0.00				0.00			
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					42	60		23	51	56	918	454	118	1285	636				
Adjusted Saturation Flow Rate (s), veh/h/in					1528	1610		1490	1610	1810	1870	1850	1795	1885	1863				
Queue Service Time (g s), s					1.9	5.7		0.0	4.6	4.9	13.0	13.0	10.3	0.0	0.0				
Cycle Queue Clearance Time (g c), s					4.2	5.7		2.3	4.6	4.9	13.0	13.0	10.3	0.0	0.0				
Green Ratio (g/C)					0.05	0.09		0.05	0.13	0.05	0.75	0.75	0.08	0.79	0.79				
Capacity (c), veh/h					117	145		115	205	84	2805	1388	150	2969	1467				
Volume-to-Capacity Ratio (X)					0.358	0.416		0.205	0.248	0.671	0.327	0.327	0.787	0.433	0.433				
Back of Queue (Q), ft/in (95 th percentile)					76.7	106.3		43.8	85.1	106	220.4	219.2	209.8	8.6	17.2				
Back of Queue (Q), veh/in (95 th percentile)					3.1	4.3		1.7	3.4	4.2	8.7	8.8	8.3	0.3	0.7				
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	0.00				
Uniform Delay (d 1), s/veh					74.2	68.8		73.3	62.9	75.1	6.6	6.6	69.7	0.0	0.0				
Incremental Delay (d 2), s/veh					0.7	0.7		0.3	0.2	3.4	0.3	0.6	3.4	0.5	0.9				
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	0.0				
Control Delay (d), s/veh					74.8	69.5		73.6	63.1	78.5	6.9	7.3	73.1	0.5	0.9				
Level of Service (LOS)					E	E		E	E	E	A	A	E	A	A				
Approach Delay, s/veh / LOS				71.7	E		66.4	E		9.9	A		4.8	A					
Intersection Delay, s/veh / LOS				9.9						A									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62	C		2.62	C		1.86	B		1.85	B					
Bicycle LOS Score / LOS				0.66	A		0.61	A		1.27	A		1.61	B					

HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		PM		PHF		0.98									
Urban Street		Dixie Highway		Analysis Year		2028 No Build		Analysis Period		1> 4:00									
Intersection		Meyers Lane		File Name		PM 28 NB.xus													
Project Description		Oak 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				33	8	60	18	5	51	56	1331	27	117	1860	41				
Signal Information																			
Cycle, s	160.0	Reference Phase	2	Green	6.5	6.0	119.9	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Offset, s	0	Reference Point	End	Yellow	3.5	0.0	3.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On																
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						14.6				14.6		13.0		126.4		19.0		132.4	
Change Period, (Y+R c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.2				3.2		3.1		0.0		3.1		0.0	
Queue Clearance Time (g s), s						7.7				6.7		7.0				12.4			
Green Extension Time (g e), s						0.3				0.3		0.1		0.0		0.2		0.0	
Phase Call Probability						1.00				1.00		0.92				1.00			
Max Out Probability						0.00				0.00		0.00				0.00			
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					42	61		23	52	57	927	459	119	1298	642				
Adjusted Saturation Flow Rate (s), veh/h/ln					1529	1610		1490	1610	1810	1870	1850	1795	1885	1863				
Queue Service Time (g s), s					1.9	5.7		0.0	4.7	5.0	13.2	13.2	10.4	0.0	0.0				
Cycle Queue Clearance Time (g c), s					4.2	5.7		2.3	4.7	5.0	13.2	13.2	10.4	0.0	0.0				
Green Ratio (g/C)					0.05	0.09		0.05	0.13	0.05	0.75	0.75	0.08	0.79	0.79				
Capacity (c), veh/h					117	146		115	207	85	2802	1386	152	2966	1466				
Volume-to-Capacity Ratio (X)					0.357	0.419		0.204	0.252	0.673	0.331	0.331	0.788	0.438	0.438				
Back of Queue (Q), ft/ln (95 th percentile)					76.6	108.1		43.7	86.7	107.8	223	221.8	211.2	8.8	17.5				
Back of Queue (Q), veh/ln (95 th percentile)					3.1	4.3		1.7	3.5	4.3	8.8	8.9	8.4	0.3	0.7				
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	0.00				
Uniform Delay (d 1), s/veh					74.1	68.7		73.2	62.8	75.0	6.7	6.7	69.6	0.0	0.0				
Incremental Delay (d 2), s/veh					0.7	0.7		0.3	0.2	3.4	0.3	0.6	3.4	0.5	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	0.0				
Control Delay (d), s/veh					74.8	69.4		73.6	63.0	78.5	7.0	7.3	73.0	0.5	1.0				
Level of Service (LOS)					E	E		E	E	E	A	A	E	A	A				
Approach Delay, s/veh / LOS				71.6	E		66.3	E		9.9	A		4.8	A					
Intersection Delay, s/veh / LOS				10.0						A									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62	C		2.62	C		1.86	B		1.85	B					
Bicycle LOS Score / LOS				0.66	A		0.61	A		1.28	A		1.62	B					

HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Diane B. Zimmerman Traffic Engineering LLC				Duration, h		0.250											
Analyst		DBZ		Analysis Date		1/9/2024		Area Type		Other									
Jurisdiction				Time Period		PM		PHF		0.98									
Urban Street		Dixie Highway		Analysis Year		2028 Build		Analysis Period		1> 4:00									
Intersection		Meyers Lane		File Name		PM 28 B.xus													
Project Description		Oak 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				33	8	60	33	5	86	56	1331	53	175	1860	41				
Signal Information																			
Cycle, s	160.0	Reference Phase	2		Green	6.5	4.8	112.6	10.0	0.0	0.0	0.0	0.0	0.0	0.0				
Offset, s	0	Reference Point	End		Yellow	3.5	3.5	3.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0				
Uncoordinated	No	Simult. Gap E/W	On		Red	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						7.0				7.0		2.0		4.0		2.0		4.0	
Phase Duration, s						16.6				16.6		13.0		119.1		24.3		130.4	
Change Period, (Y+R c), s						6.6				6.6		6.5		6.5		6.5		6.5	
Max Allow Headway (MAH), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time (g s), s						7.7				9.6		7.0				17.5			
Green Extension Time (g e), s						0.4				0.4		0.1		0.0		0.3		0.0	
Phase Call Probability						1.00				1.00		0.92				1.00			
Max Out Probability						0.00				0.00		0.00				0.00			
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					42	61		39	88	57	948	464	179	1298	642				
Adjusted Saturation Flow Rate (s), veh/h/ln					1525	1610		1444	1610	1810	1870	1832	1795	1885	1863				
Queue Service Time (g s), s					0.1	5.7		0.0	7.6	5.0	16.1	16.1	15.5	0.0	0.0				
Cycle Queue Clearance Time (g c), s					4.2	5.7		4.1	7.6	5.0	16.1	16.1	15.5	0.0	0.0				
Green Ratio (g/C)					0.06	0.10		0.06	0.17	0.05	0.70	0.70	0.12	0.77	0.77				
Capacity (c), veh/h					136	166		132	279	85	2633	1290	211	2920	1443				
Volume-to-Capacity Ratio (X)					0.308	0.369		0.293	0.314	0.673	0.360	0.360	0.847	0.444	0.445				
Back of Queue (Q), ft/ln (95 th percentile)					75.4	106.3		72.1	141.2	107.9	271.7	267.8	288.2	9.1	18				
Back of Queue (Q), veh/ln (95 th percentile)					3.0	4.3		2.8	5.6	4.3	10.7	10.7	11.4	0.4	0.7				
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	0.00				
Uniform Delay (d 1), s/veh					72.2	66.9		72.2	57.8	75.0	9.4	9.4	66.1	0.0	0.0				
Incremental Delay (d 2), s/veh					0.5	0.5		0.5	0.2	3.4	0.4	0.8	3.6	0.5	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	0.0				
Control Delay (d), s/veh					72.7	67.4		72.7	58.0	78.5	9.8	10.2	69.7	0.5	1.0				
Level of Service (LOS)					E	E		E	E	E	A	B	E	A	A				
Approach Delay, s/veh / LOS				69.6	E		62.5	E		12.6	B		6.5	A					
Intersection Delay, s/veh / LOS				12.4						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.62	C		2.62	C		1.88	B		1.85	B					
Bicycle LOS Score / LOS				0.66	A		0.70	A		1.30	A		1.65	B					

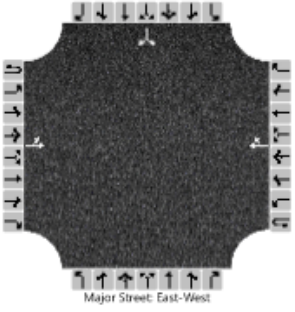
HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2023								North/South Street	Christie Ave							
Time Analyzed	AM Peak								Peak Hour Factor	0.83							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	1	0
Configuration	LT								TR								
Volume (veh/h)		10	32					93	4						5		8
Percent Heavy Vehicles (%)		30													20		12
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.40													6.60		6.32
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.47													3.68		3.41
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12														16	
Capacity, c (veh/h)		1315														849	
v/c Ratio		0.01														0.02	
95% Queue Length, Q ₉₅ (veh)		0.0														0.1	
Control Delay (s/veh)		7.8	0.1													9.3	
Level of Service (LOS)		A	A													A	
Approach Delay (s/veh)	1.9												9.3				
Approach LOS	A												A				

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HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2028								North/South Street	Christie Ave							
Time Analyzed	AM Peak No Build								Peak Hour Factor	0.83							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	1	0	
Configuration	LT				TR								LR				
Volume (veh/h)		10	32				94	4						5		8	
Percent Heavy Vehicles (%)		30												20		12	
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.40												6.60		6.32	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.47												3.68		3.41	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12													16		
Capacity, c (veh/h)		1313													848		
v/c Ratio		0.01													0.02		
95% Queue Length, Q ₉₅ (veh)		0.0													0.1		
Control Delay (s/veh)		7.8	0.1												9.3		
Level of Service (LOS)		A	A												A		
Approach Delay (s/veh)	1.9												9.3				
Approach LOS	A												A				

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HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2028								North/South Street	Christie Ave							
Time Analyzed	AM Peak Build								Peak Hour Factor	0.83							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak Pointe																
Lanes																	
<p>Major Street: East-West</p>																	
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	1	0	
Configuration	LT				TR								LR				
Volume (veh/h)		10	56				172	4						5		8	
Percent Heavy Vehicles (%)		30												20		12	
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.40												6.60		6.32	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.47												3.68		3.41	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12													16		
Capacity, c (veh/h)		1209													737		
v/c Ratio		0.01													0.02		
95% Queue Length, Q ₉₅ (veh)		0.0													0.1		
Control Delay (s/veh)		8.0	0.1												10.0		
Level of Service (LOS)		A	A												A		
Approach Delay (s/veh)	1.3												10.0				
Approach LOS	A												A				
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HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2023								North/South Street	Christie Ave							
Time Analyzed	PM Peak								Peak Hour Factor	0.84							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak Pointe																
Lanes																	
 <p>Major Street: East-West</p>																	
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	1	0	
Configuration	LT								TR				LR				
Volume (veh/h)		10	89				46	6						3		8	
Percent Heavy Vehicles (%)		0												67		0	
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage					Undivided												
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												7.07		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												4.10		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12													13		
Capacity, c (veh/h)		1554													888		
v/c Ratio		0.01													0.01		
95% Queue Length, Q ₉₅ (veh)		0.0													0.0		
Control Delay (s/veh)		7.3	0.1												9.1		
Level of Service (LOS)		A	A												A		
Approach Delay (s/veh)	0.8												9.1				
Approach LOS	A												A				

HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2028								North/South Street	Christie Ave							
Time Analyzed	PM Peak No Build								Peak Hour Factor	0.84							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	1	0
Configuration	LT								TR								
Volume (veh/h)		10	90				46	6							3		8
Percent Heavy Vehicles (%)		0													67		0
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.10													7.07		6.20
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.20													4.10		3.30
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12														13	
Capacity, c (veh/h)		1554														888	
v/c Ratio		0.01														0.01	
95% Queue Length, Q ₉₅ (veh)		0.0														0.0	
Control Delay (s/veh)		7.3	0.1													9.1	
Level of Service (LOS)		A	A													A	
Approach Delay (s/veh)	0.8												9.1				
Approach LOS	A												A				

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HCS Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst	DBZ								Intersection	Dawn Dr at Christie Ave							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC								Jurisdiction								
Date Performed	1/9/2024								East/West Street	Dawn Dr							
Analysis Year	2028								North/South Street	Christie Ave							
Time Analyzed	PM Peak Build								Peak Hour Factor	0.84							
Intersection Orientation	East-West								Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	1	0
Configuration		LT						TR								LR	
Volume (veh/h)		10	174				96	6							3		8
Percent Heavy Vehicles (%)		0													67		0
Proportion Time Blocked																	
Percent Grade (%)															0		
Right Turn Channelized																	
Median Type Storage					Undivided												
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.10													7.07		6.20
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.20													4.10		3.30
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		12														13	
Capacity, c (veh/h)		1479														777	
v/c Ratio		0.01														0.02	
95% Queue Length, Q ₉₅ (veh)		0.0														0.1	
Control Delay (s/veh)		7.5	0.1													9.7	
Level of Service (LOS)		A	A													A	
Approach Delay (s/veh)		0.5												9.7			
Approach LOS		A												A			

HCS Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Dawn Dr at West Entrance							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC							Jurisdiction								
Date Performed	1/9/2024							East/West Street	Dawn Drive							
Analysis Year	2028							North/South Street	West Entrance							
Time Analyzed	AM Peak							Peak Hour Factor	0.83							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	0	0
Configuration				TR			LT					LR				
Volume (veh/h)			53	8			5	149			27		15			
Percent Heavy Vehicles (%)							0				0		0			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)							4.1					7.1			6.2	
Critical Headway (sec)							4.10					6.40			6.20	
Base Follow-Up Headway (sec)							2.2					3.5			3.3	
Follow-Up Headway (sec)							2.20					3.50			3.30	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							6					51				
Capacity, c (veh/h)							1539					808				
v/c Ratio							0.00					0.06				
95% Queue Length, Q ₉₅ (veh)							0.0					0.2				
Control Delay (s/veh)							7.3	0.0				9.8				
Level of Service (LOS)							A	A				A				
Approach Delay (s/veh)					0.3				9.8							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Dawn Dr at West Entrance							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC							Jurisdiction								
Date Performed	1/9/2024							East/West Street	Dawn Drive							
Analysis Year	2028							North/South Street	West Entrance							
Time Analyzed	PM Peak							Peak Hour Factor	0.84							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	0	0
Configuration				TR			LT					LR				
Volume (veh/h)			148	29			16	85			17		9			
Percent Heavy Vehicles (%)							0				0		0			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)							4.1					7.1			6.2	
Critical Headway (sec)							4.10					6.40			6.20	
Base Follow-Up Headway (sec)							2.2					3.5			3.3	
Follow-Up Headway (sec)							2.20					3.50			3.30	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							19					31				
Capacity, c (veh/h)							1372					713				
v/c Ratio							0.01					0.04				
95% Queue Length, Q ₉₅ (veh)							0.0					0.1				
Control Delay (s/veh)							7.7	0.1				10.3				
Level of Service (LOS)							A	A				B				
Approach Delay (s/veh)					1.3				10.3							
Approach LOS					A				B							

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HCS Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Dawn Dr at East Entrance							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC							Jurisdiction								
Date Performed	1/9/2024							East/West Street	Dawn Drive							
Analysis Year	2028							North/South Street	East Entrance							
Time Analyzed	AM Peak							Peak Hour Factor	0.83							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	0	0
Configuration				TR			LT					LR				
Volume (veh/h)			52	16			8	103			51		27			
Percent Heavy Vehicles (%)							0				0		0			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)							4.1					7.1			6.2	
Critical Headway (sec)							4.10					6.40			6.20	
Base Follow-Up Headway (sec)							2.2					3.5			3.3	
Follow-Up Headway (sec)							2.20					3.50			3.30	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							10					94				
Capacity, c (veh/h)							1528					837				
v/c Ratio							0.01					0.11				
95% Queue Length, Q ₉₅ (veh)							0.0					0.4				
Control Delay (s/veh)							7.4	0.0				9.8				
Level of Service (LOS)							A	A				A				
Approach Delay (s/veh)					0.6				9.8							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Dawn Dr at East Entrance							
Agency/Co.	Diane B. Zimmerman Traffic Engineering LLC							Jurisdiction								
Date Performed	1/9/2024							East/West Street	Dawn Drive							
Analysis Year	2028							North/South Street	East Entrance							
Time Analyzed	PM Peak							Peak Hour Factor	0.84							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Oak 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	0	0
Configuration				TR			LT					LR				
Volume (veh/h)			102	55			29	68			33		18			
Percent Heavy Vehicles (%)							0				0		0			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)							4.1					7.1			6.2	
Critical Headway (sec)							4.10					6.40			6.20	
Base Follow-Up Headway (sec)							2.2					3.5			3.3	
Follow-Up Headway (sec)							2.20					3.50			3.30	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							35					61				
Capacity, c (veh/h)							1400					739				
v/c Ratio							0.02					0.08				
95% Queue Length, Q ₉₅ (veh)							0.1					0.3				
Control Delay (s/veh)							7.6	0.2				10.3				
Level of Service (LOS)							A	A				B				
Approach Delay (s/veh)					2.4				10.3							
Approach LOS					A				B							

West Entrance

Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	16	Speed Limit (mph)	25
Advancing Volume (vph)	101	No. of through lanes	1
Opposing Volume (vph)	177	Percent Heavy Vehicles (decimal percent)	0.01

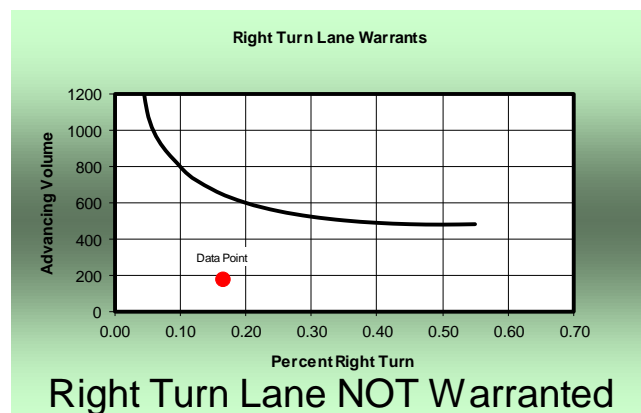


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	29	Speed Limit (mph)	25
Advancing Volume (vph)	177		



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

East Entrance

Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	29	Speed Limit (mph)	25
Advancing Volume (vph)	97	No. of through lanes	1
Opposing Volume (vph)	157	Percent Heavy Vehicles (decimal percent)	0.01

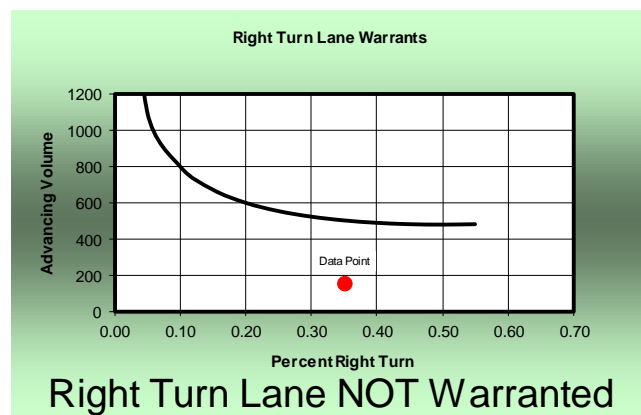


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	55	Speed Limit (mph)	25
Advancing Volume (vph)	157		



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.