final report

June 6, 2024
Revised December 18, 2024

Traffic Impact Study

Kentucky Tennis and Pickleball Center
Trevilian Way
Louisville, KY

Prepared for

Louisville Metro Planning Commission

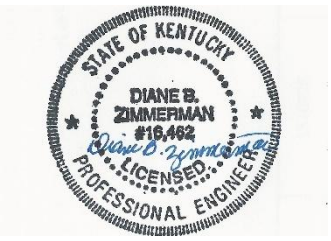

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Table of Contents

INTRODUCTION

The Kentucky Tennis and Pickleball Center is proposed on the site of the current Louisville Tennis Center between Trevilian Way and Sheridan Avenue in Louisville, KY. The new center shows 36 tennis courts and 18 pickleball courts with both indoor and outdoor courts. **Figure 1** displays a map of the site. Access to the center will be from entrances on Trevilian Way and Sheridan Avenue. 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 Trevilian Way with the zoo entrances. The new center entrances on Trevilian Way will mirror the access to the zoo.

Figure 1. Site Map

EXISTING CONDITIONS

Trevilian Way is a Metro Louisville maintained road with an estimated 2024 ADT volume of 4,100 vehicles per day east of the zoo exit, as estimated from the turning movement count and the K factor of 16.8 from the Kentucky Transportation Cabinet count station 939. Metro Public Works classifies the road as a minor arterial. The road on either side of the zoo access is two lanes with ten-foot lanes and a one-foot shoulder. Between the roundabouts, the road has 16-foot lanes and curbs. The speed limit is 35 mph. There is a continuous sidewalk on the south side and a multi-use path on the north side that connects to the intersection of Sheridan Avenue and Illinois Avenue. The intersections with the zoo access are controlled with a roundabout at each.

Peak hour traffic counts for the intersections were obtained on April 9, 2024. The a.m. peak hour occurred at 7:15 to 8:15 and the p.m. peak hour occurred at 4:30 to 5:30. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes.

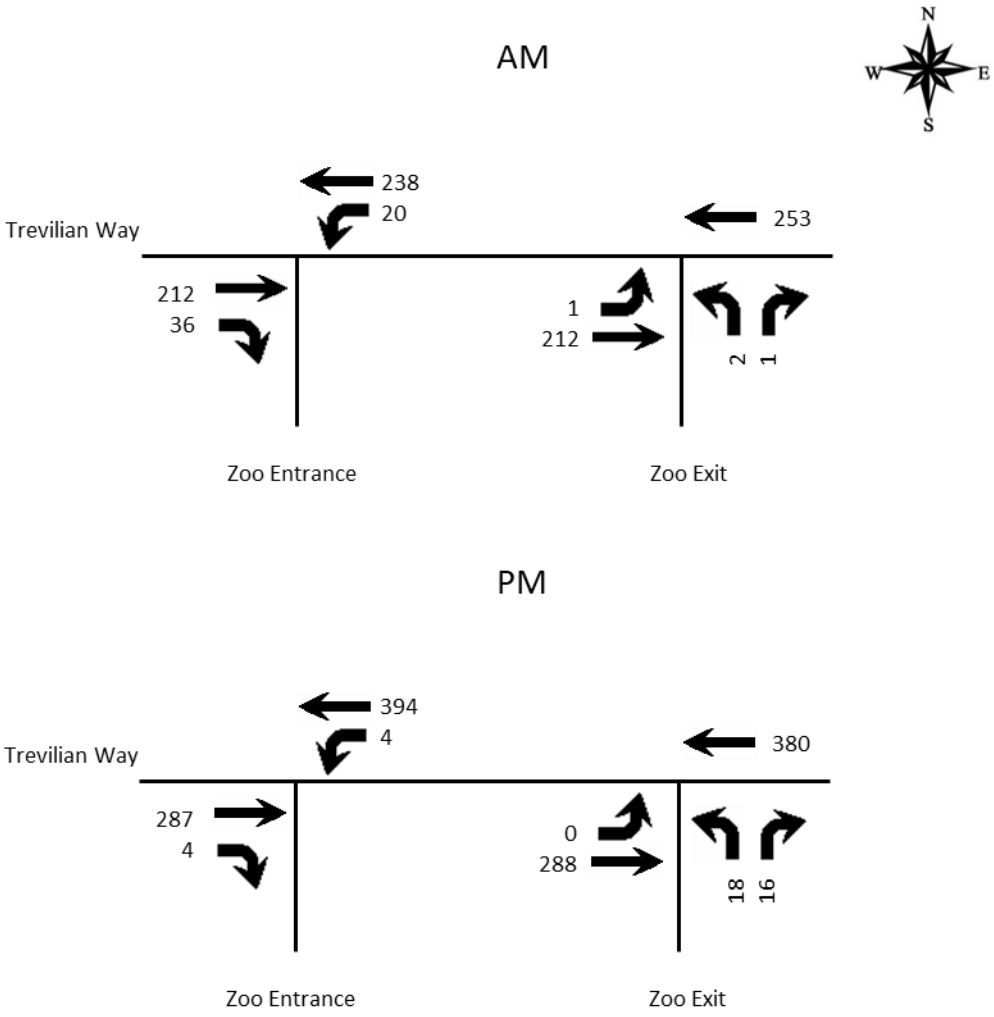


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2027. An annual growth rate of 1.0 percent was applied to all volumes. **Figure 3** displays the 2027 No Build peak hour volumes.

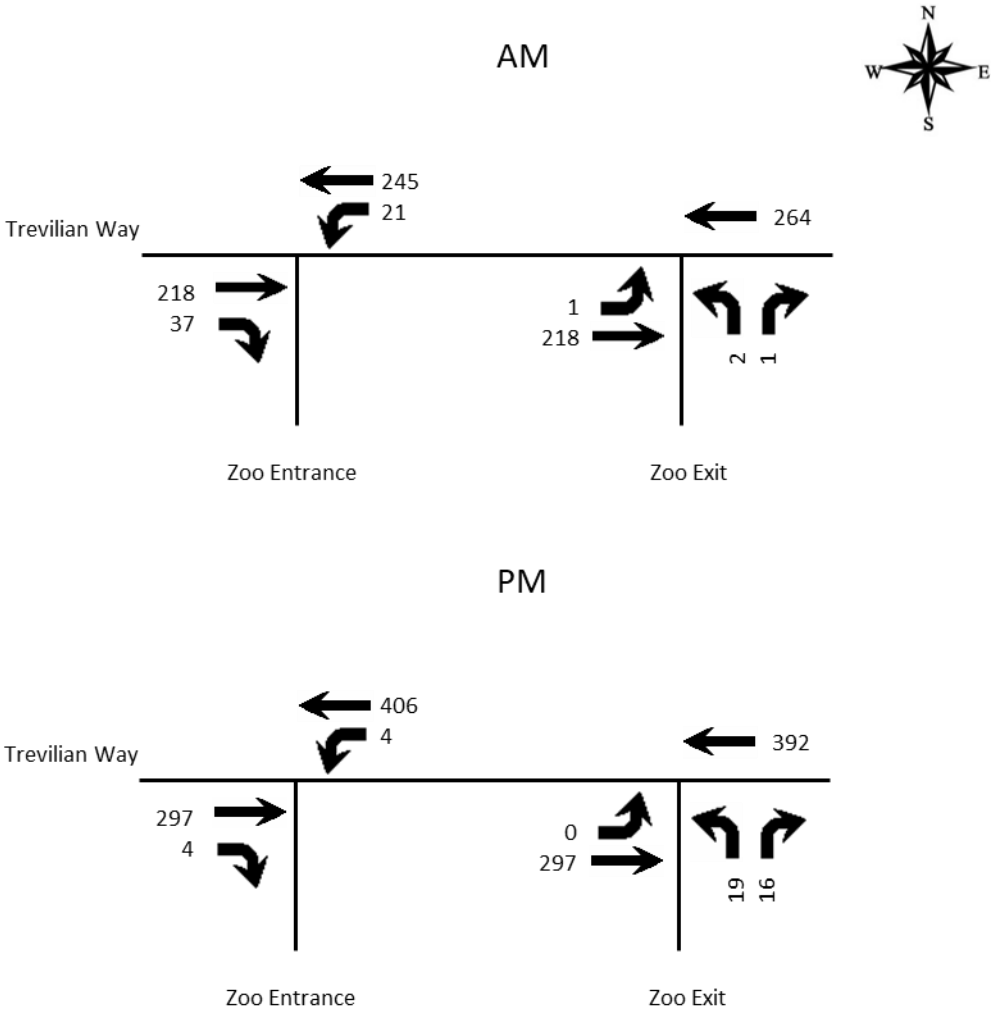


Figure 3. No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 11th Edition contains trip generation rates for a wide range of development, however nothing like what is proposed. The trip generation is estimated from the operator for the anticipated daily use and is listed in **Table 1**. In addition to the courts, the facility will offer a training facility and a restaurant. The trips were assigned to the highway network with the percentages shown in **Figure 4**. These percentages are reflective of the peak hour traffic flow on Trevilian Way. **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

	A.M. Peak Hour			P.M. Peak Hour		
Land Use	Trips	In	Out	Trips	In	Out
Tennis Center	189	114	75	196	119	77

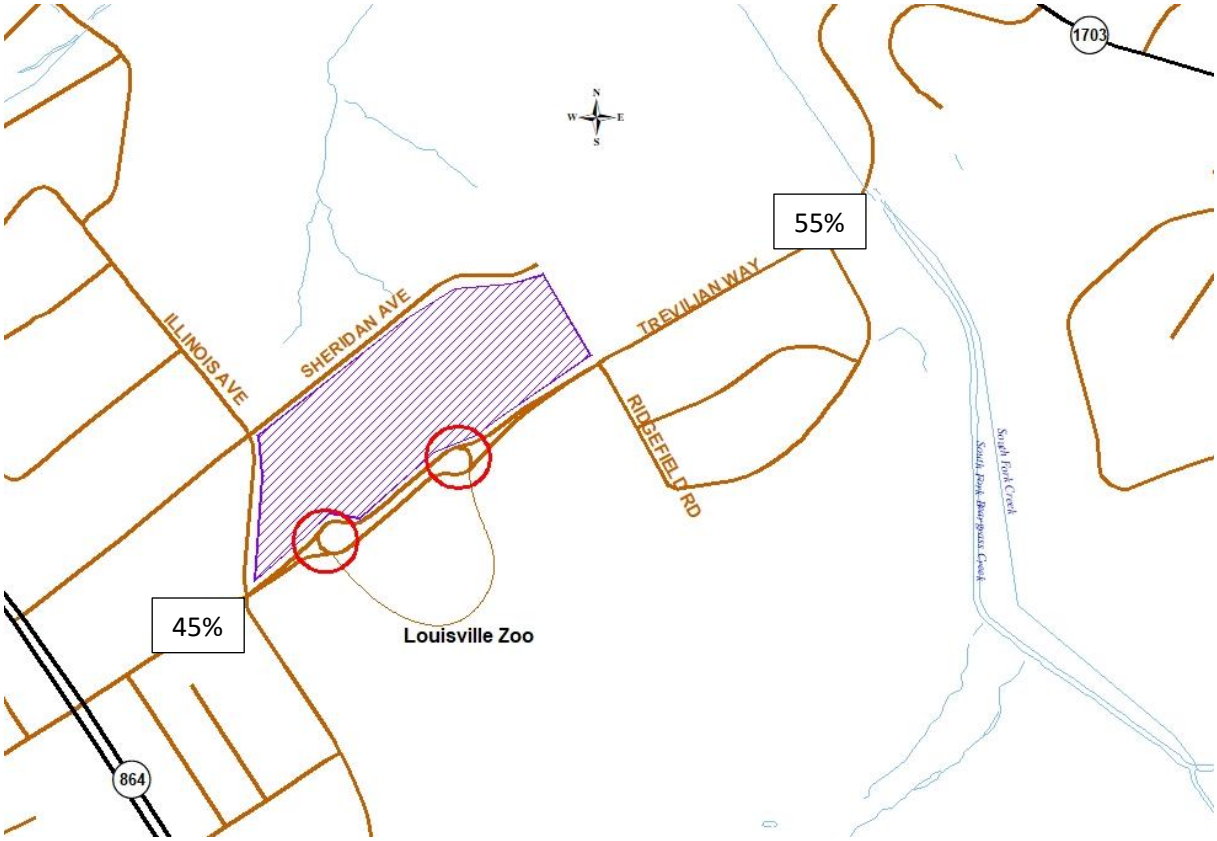


Figure 4. Trip Distribution Percentages

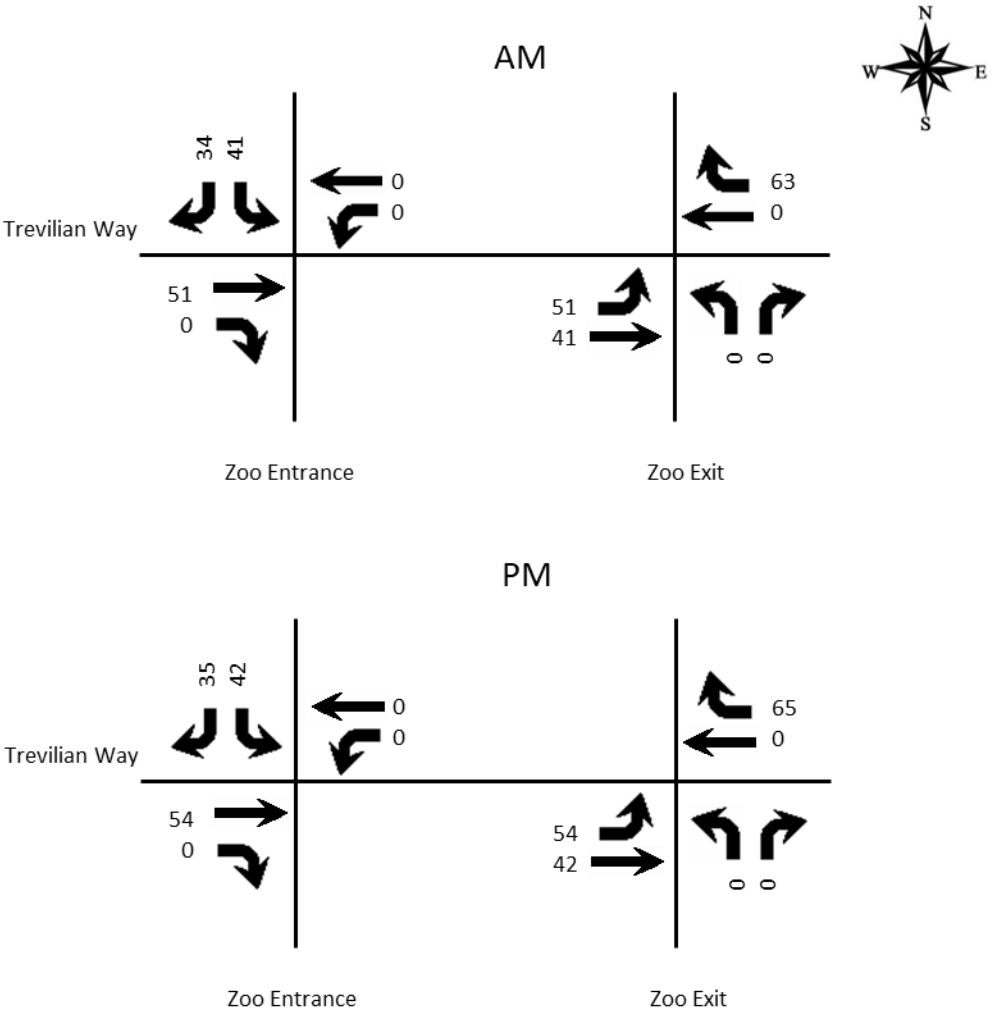


Figure 5. Peak Hour Trips Generated by Site

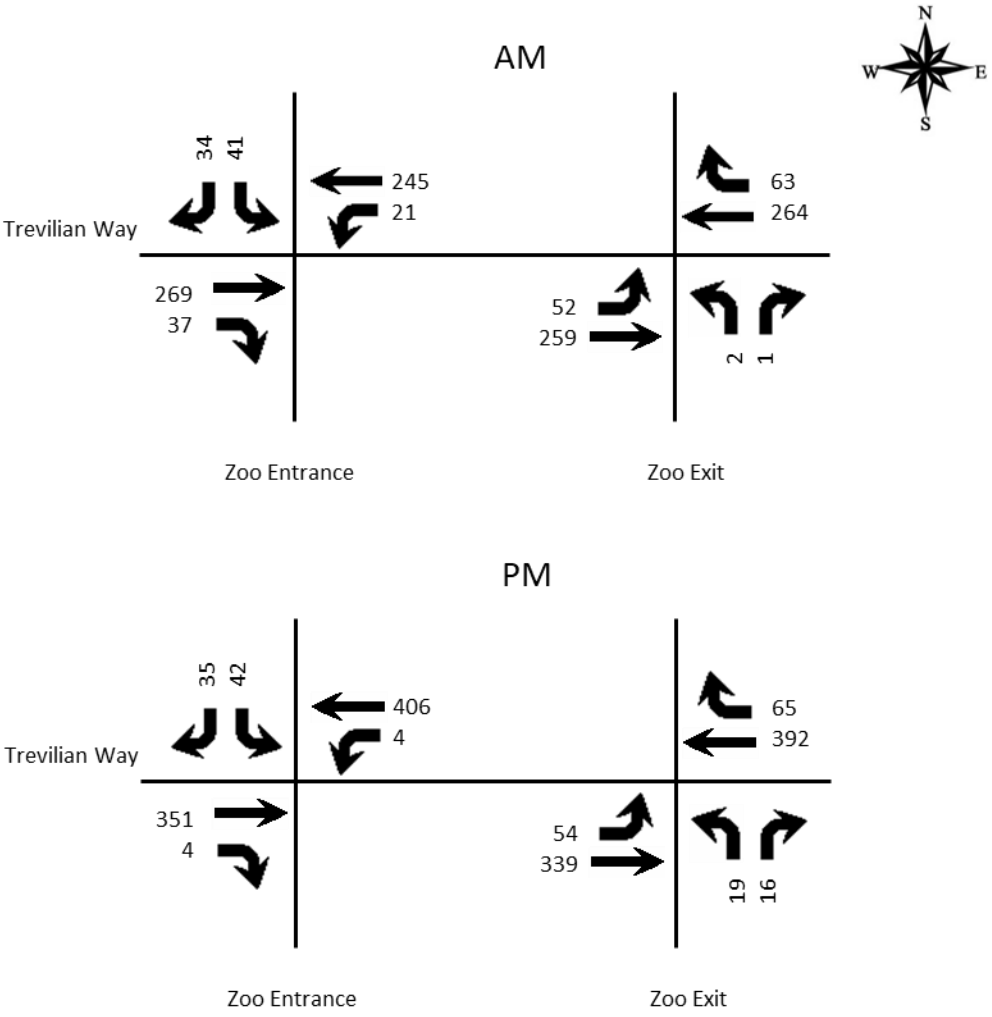


Figure 6. Build Peak Hour Volumes

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 average 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 (version 2024) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Peak Hour Level of Service

	A.M.			P.M.		
Approach	2024 Existing	2027 No Build	2027 Build	2024 Existing	2027 No Build	2027 Build
Trevilian Way at Zoo Entrance	**A 4.1**	**A 4.1**	**A 4.4**	**A 5.0**	**A 5.1**	**A 5.3**
Trevilian Way Eastbound	A 3.6	A 3.7	A 4.4	A 4.5	A 4.6	A 5.3
Trevilian Way Westbound	A 4.5	A 4.6	A 4.6	A 5.4	A 5.5	A 5.5
Tennis Center exit Southbound			A 3.7			A 4.2
Trevilian Way at Zoo Exit	**A 4.4**	**A 4.4**	**A 4.4**	**A 5.0**	**A 5.0**	**A 5.4**
Trevilian Way Eastbound	A 4.2	A 4.2	A 4.4	A 4.5	A 4.6	A 5.3
Trevilian Way Westbound	A 4.5	A 4.6	A 4.6	A 5.4	A 5.5	A 5.5
Zoo exit Northbound	A 3.2	A 3.2	A 3.7	A 3.5	A 3.5	A 3.9

Key: Level of Service, Delay in seconds per vehicle

The entrance was evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated July, 2020. Using the volumes in Figure 6, the warrant for a right turn lane is not satisfied at the entrance.

ZOO STRESS TEST

At the request of the Louisville Zoo, a stress test of the intersections was conducted using data provided by the Louisville Zoo. The attendance for a busy day without a special event was selected. The daily attendance of 7,729 visitors was selected. The zoo estimates the average occupancy is 3.05 persons per vehicle. The zoo also provided hourly estimates of arriving and departing visitors. These calculations result in the highest hour of arriving and departing vehicles is 12:00 to 1:00 p.m. with 633 arriving vehicles and 253 departing vehicles. These trips were assigned to the zoo access with 60 percent from Poplar Level Road and 40 percent from Newburg Road.

For the through volume on Trevillian Way 150 vehicles per hour will be used in each direction. For the tennis center, a Saturday or Sunday during the summer is estimated to have 86 arriving vehicles and 77 departing vehicles. **Figure 7** displays the turning movements for the hour of 12:00 to 1:00 pm. **Table 3** displays the capacity results. The full printouts are included in the appendix.

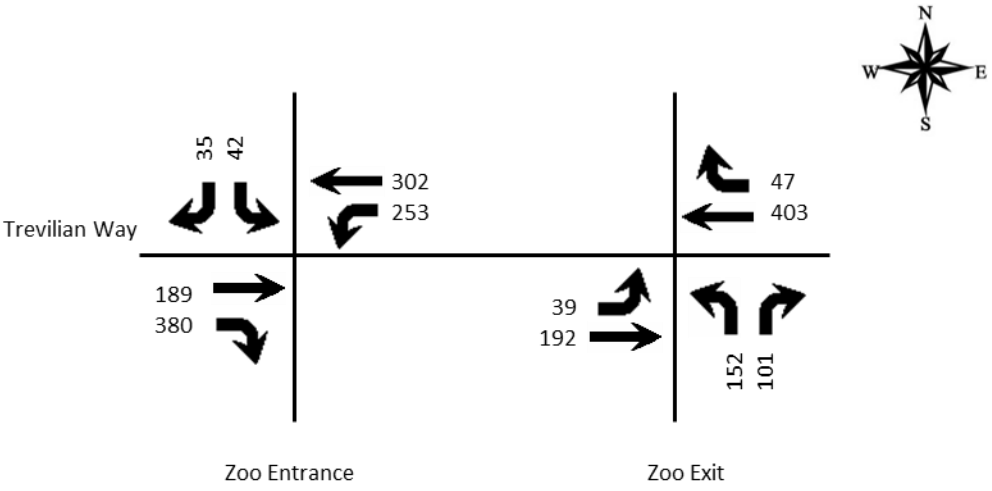


Figure 7. Zoo Stress Test Hourly Volumes

Table 3. Zoo Stress Test Hour Level of Service

Approach	2027 12:00
Trevilian Way at Zoo Entrance	**A 4.3**
Trevilian Way Eastbound	A 1.8
Trevilian Way Westbound	A 6.7
Tennis Center exit Southbound	A 4.8
Trevilian Way at Zoo Exit	**A 5.4**
Trevilian Way Eastbound	A 4.1
Trevilian Way Westbound	A 6.7
Zoo exit Northbound	A 4.2

Key: Level of Service, Delay in seconds per vehicle

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a manageable impact to the existing highway network, with Levels of Service remaining within acceptable limits.

APPENDIX

Traffic Counts

Classified Turn Movement Count || All vehicles

Louisville, KY

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Site 1
Driveway

Trevilian Way (West)
Trevilian Way (East)

Date
Tuesday, April 9, 2024

Lat/Long
38.207088°, -85.709636°
Click here for Map

Weather
Cloudy
63°F
Click here for Detailed Weather

0700 - 0900 (Weekday 2h Session) (04-09-2024)
All vehicles

	Northbound			Eastbound				Westbound				
	Driveway			Trevilian Way (West)				Trevilian Way (East)				
TIME	Thru 1.1	Right 1.2	U-Turn 1.3	App Total	Left 1.4	Thru 1.5	U-Turn 1.6	App Total	Int Total
0700 - 0715	39	0	0	39	0	33	0	33	72
0715 - 0730	54	2	0	56	1	59	0	60	116
0730 - 0745	67	4	0	71	0	76	0	76	147
0745 - 0800	48	17	0	65	11	56	0	67	132
Hourly Total	208	23	0	**231**	12	224	0	**236**	**467**
0800 - 0815	43	12	0	55	8	47	0	55	110
0815 - 0830	47	7	0	54	1	54	1	56	110
0830 - 0845	42	7	0	49	1	56	0	57	106
0845 - 0900	51	8	0	59	6	40	0	46	105
Hourly Total	183	34	0	**217**	16	197	1	**214**	**431**
Grand Total	391	57	0	**448**	28	421	1	**450**	**898**
Approach %	87.28	12.72	0.00	-	6.22	93.56	0.22	-	
Intersection %	43.54	6.35	0.00	49.89	3.12	46.88	0.11	50.11	
Heavy Vehicle %	2	5	-	**2**	0	3	0	**3**	**2**
PHF	0.79	0.51	0.00	**0.87**	0.45	0.78	0.00	**0.85**	**0.86**

1600 - 1800 (Weekday 2h Session) (04-09-2024)
All vehicles

	Northbound			Eastbound				Westbound				
	Driveway			Trevilian Way (West)				Trevilian Way (East)				
TIME	Thru 1.1	Right 1.2	U-Turn 1.3	App Total	Left 1.4	Thru 1.5	U-Turn 1.6	App Total	Int Total
1600 - 1615	70	1	1	72	0	65	1	66	138
1615 - 1630	46	2	0	48	0	78	0	78	126
1630 - 1645	80	1	0	81	2	84	0	86	167
1645 - 1700	63	2	0	65	1	99	0	100	165
Hourly Total	259	6	1	**266**	3	326	1	**330**	**596**
1700 - 1715	77	1	0	78	0	97	0	97	175
1715 - 1730	67	0	0	67	1	108	0	109	176
1730 - 1745	72	1	0	73	2	91	0	93	166
1745 - 1800	61	2	0	63	2	105	0	107	170
Hourly Total	277	4	0	**281**	5	401	0	**406**	**687**
Grand Total	536	10	1	**547**	8	727	1	**736**	**1283**
Approach %	97.99	1.83	0.18	-	1.09	98.78	0.14	-	
Intersection %	41.78	0.78	0.08	42.63	0.62	56.66	0.08	57.37	
Heavy Vehicle %	1	10	0	**1**	0	2	0	**2**	**1**
PHF	0.90	0.50	0.00	**0.90**	0.63	0.93	0.00	**0.93**	**0.98**

To determine the p.m. peak hour both intersections were treated as a single intersection with a total p.m. peak hour volume of 705 vehicles.

Classified Turn Movement Count || All vehicles

Louisville, KY

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Site 2
Driveway

Trevilian Way (West)
Trevilian Way (East)

Date
Tuesday, April 9, 2024

Lat/Long
38.208106°, -85.707669°
Click here for Map

Weather
Cloudy
63°F
Click here for Detailed Weather

0700 - 0900 (Weekday 2h Session) (04-09-2024)
All vehicles

	Northbound Driveway			Eastbound Trevilian Way (West)			Westbound Trevilian Way (East)			
TIME	Left 2.1	Right 2.2	App Total	Thru 2.3	U-Turn 2.4	App Total	Thru 2.5	U-Turn 2.6	App Total	Int Total
0700 - 0715	1	0	1	40	0	40	33	0	33	74
0715 - 0730	0	0	0	53	0	53	58	0	58	111
0730 - 0745	0	1	1	62	1	63	77	0	77	141
0745 - 0800	1	0	1	55	0	55	64	0	64	120
Hourly Total	2	1	**3**	210	1	**211**	232	0	**232**	**446**
0800 - 0815	1	0	1	42	0	42	54	0	54	97
0815 - 0830	0	0	0	49	0	49	56	0	56	105
0830 - 0845	3	2	5	41	0	41	52	0	52	98
0845 - 0900	5	4	9	51	0	51	41	0	41	101
Hourly Total	9	6	**15**	183	0	**183**	203	0	**203**	**401**
Grand Total	11	7	**18**	393	1	**394**	435	0	**435**	**847**
Approach %	61.11	38.89	-	99.75	0.25	-	100.00	0.00	-	
Intersection %	1.30	0.83	2.13	46.40	0.12	46.52	51.36	0.00	51.36	
Heavy Vehicle %	18	0	**11**	2	0	**2**	3	-	**3**	**2**
PHF	0.50	0.25	**0.75**	0.85	0.25	**0.85**	0.82	0.00	**0.82**	**0.83**

1600 - 1800 (Weekday 2h Session) (04-09-2024)
All vehicles

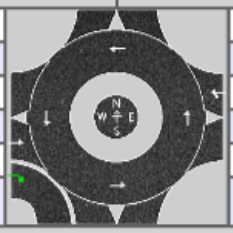
	Northbound Driveway			Eastbound Trevilian Way (West)			Westbound Trevilian Way (East)			
TIME	Left 2.1	Right 2.2	App Total	Thru 2.3	U-Turn 2.4	App Total	Thru 2.5	U-Turn 2.6	App Total	Int Total
1600 - 1615	5	1	6	68	0	68	63	0	63	137
1615 - 1630	3	3	6	45	0	45	76	0	76	127
1630 - 1645	5	4	9	77	0	77	81	0	81	167
1645 - 1700	4	5	9	68	0	68	95	0	95	172
Hourly Total	17	13	**30**	258	0	**258**	315	0	**315**	**603**
1700 - 1715	4	6	10	77	0	77	93	0	93	180
1715 - 1730	5	1	6	66	0	66	111	0	111	183
1730 - 1745	2	2	4	71	0	71	86	0	86	161
1745 - 1800	4	5	9	61	1	62	100	0	100	171
Hourly Total	15	14	**29**	275	1	**276**	390	0	**390**	**695**
Grand Total	32	27	**59**	533	1	**534**	705	0	**705**	**1298**
Approach %	54.24	45.76	-	99.81	0.19	-	100.00	0.00	-	
Intersection %	2.47	2.08	4.55	41.06	0.08	41.14	54.31	0.00	54.31	
Heavy Vehicle %	3	0	**2**	1	0	**1**	2	-	**2**	**1**
PHF	0.90	0.67	**0.85**	0.94	0.00	**0.94**	0.86	0.00	**0.86**	**0.96**

HCS Reports

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	5/13/2024
Analysis Year	2024
Time Analyzed	AM Peak
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.86
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Lane Assignment			T				LT									
Volume (V), veh/h	0		212	36	0	20	238									
Percent Heavy Vehicles, %	0		1	0	0	0	2									
Flow Rate (v_{PCE}), pc/h	0		249	42	0	23	282									
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1											
Pedestrians Crossing, p/h	0				0											
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763							
Follow-Up Headway, s		2.6087			2.6087							

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		249	42		305							
Entry Volume, veh/h		247	42		299							
Circulating Flow (v_c), pc/h	23			0			249			305		
Exiting Flow (v_{ex}), pc/h	249			282			0			23		
Capacity (c_{pce}), pc/h		1348			1380							
Capacity (c), veh/h		1335			1355							
v/c Ratio (x)		0.18			0.22							

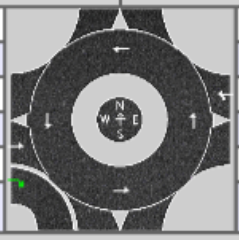
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			4.5							
Lane LOS		A	A		A							
95% Queue Length, Q_{95} (veh)		0.7			0.8							
95% Queue Length, Q_{95} (ft)		17.6			20.0							
Approach Delay, s/veh | LOS	3.6	A		4.5	A							
Intersection Delay, s/veh | LOS	4.1						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	AM Peak No Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.86
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Lane Assignment			T				LT									
Volume (V), veh/h	0		218	37	0	21	245									
Percent Heavy Vehicles, %	0		1	0	0	0	2									
Flow Rate (v_{PCE}), pc/h	0		256	43	0	24	291									
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1											
Pedestrians Crossing, p/h	0				0											
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763							
Follow-Up Headway, s		2.6087			2.6087							

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		256	43		315							
Entry Volume, veh/h		253	43		309							
Circulating Flow (v_c), pc/h	24			0			256			315		
Exiting Flow (v_{ex}), pc/h	256			291			0			24		
Capacity (c_{pce}), pc/h		1347			1380							
Capacity (c), veh/h		1333			1355							
v/c Ratio (x)		0.19			0.23							

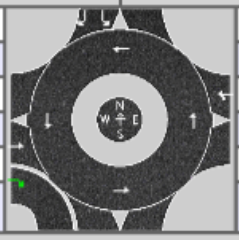
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			4.6							
Lane LOS		A	A		A							
95% Queue Length, Q_{95} (veh)		0.7			0.9							
95% Queue Length, Q_{95} (ft)		17.6			22.5							
Approach Delay, s/veh | LOS	3.7	A		4.6	A							
Intersection Delay, s/veh | LOS	4.1						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	AM Peak Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.86
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1
Lane Assignment			T				LT						L		R	
Volume (V), veh/h	0		269	37	0	21	245						0	41		34
Percent Heavy Vehicles, %	0		1	0	0	0	2						3	0		0
Flow Rate (v_{PCE}), pc/h	0		316	43	0	24	291						0	48		40
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763					4.5436	4.5436	
Follow-Up Headway, s		2.6087			2.6087					2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		316	43		315					48	40	
Entry Volume, veh/h		313	43		309					48	40	
Circulating Flow (v_c), pc/h	72			0			364			315		
Exiting Flow (v_{ex}), pc/h	364			331			0			24		
Capacity (c_{pce}), pc/h		1282			1380					1066	1066	
Capacity (c), veh/h		1270			1355					1066	1066	
v/c Ratio (x)		0.25			0.23					0.05	0.04	

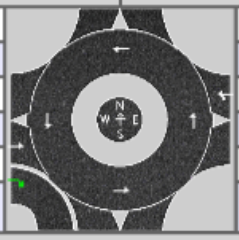
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			4.6					3.8	3.7	
Lane LOS		A	A		A					A	A	
95% Queue Length, Q_{95} (veh)		1.0			0.9					0.1	0.1	
95% Queue Length, Q_{95} (ft)		25.2			22.5					2.5	2.5	
Approach Delay, s/veh | LOS	4.4	A		4.6	A					3.7	A	
Intersection Delay, s/veh | LOS	4.4						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	5/13/2024
Analysis Year	2024
Time Analyzed	PM Peak
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Lane Assignment			T				LT									
Volume (V), veh/h	0		287	4	0	4	394									
Percent Heavy Vehicles, %	0		2	0	0	0	2									
Flow Rate (v_{PCE}), pc/h	0		308	4	0	4	423									
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1											
Pedestrians Crossing, p/h	0				0											
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763							
Follow-Up Headway, s		2.6087			2.6087							

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		308	4		427							
Entry Volume, veh/h		302	4		419							
Circulating Flow (v_c), pc/h	4			0			308			427		
Exiting Flow (v_{ex}), pc/h	308			423			0			4		
Capacity (c_{pce}), pc/h		1374			1380							
Capacity (c), veh/h		1347			1353							
v/c Ratio (x)		0.22			0.31							

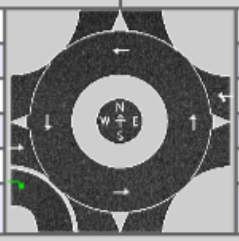
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			5.4							
Lane LOS		A	A		A							
95% Queue Length, Q_{95} (veh)		0.9			1.3							
95% Queue Length, Q_{95} (ft)		22.9			32.5							
Approach Delay, s/veh | LOS	4.5	A		5.4	A							
Intersection Delay, s/veh | LOS	5.0						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	PM Peak No Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Lane Assignment			T				LT									
Volume (V), veh/h	0		297	4	0	4	406									
Percent Heavy Vehicles, %	0		2	0	0	0	2									
Flow Rate (v_{PCE}), pc/h	0		319	4	0	4	436									
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1											
Pedestrians Crossing, p/h	0				0											
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763							
Follow-Up Headway, s		2.6087			2.6087							

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		319	4		440							
Entry Volume, veh/h		313	4		431							
Circulating Flow (v_c), pc/h	4			0			319			440		
Exiting Flow (v_{ex}), pc/h	319			436			0			4		
Capacity (c_{PCE}), pc/h		1374			1380							
Capacity (c), veh/h		1347			1353							
v/c Ratio (x)		0.23			0.32							

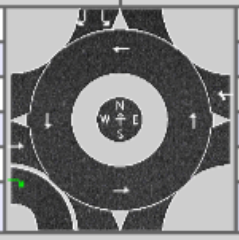
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			5.5							
Lane LOS		A	A		A							
95% Queue Length, Q_{95} (veh)		0.9			1.4							
95% Queue Length, Q_{95} (ft)		22.9			35.0							
Approach Delay, s/veh | LOS	4.6	A		5.5	A							
Intersection Delay, s/veh | LOS	5.1						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	PM Peak Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1
Lane Assignment			T				LT						L		R	
Volume (V), veh/h	0		351	4	0	4	406						0	42		35
Percent Heavy Vehicles, %	0		2	0	0	0	2						3	0		0
Flow Rate (v_{PCE}), pc/h	0		377	4	0	4	436						0	44		37
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763					4.5436	4.5436	
Follow-Up Headway, s		2.6087			2.6087					2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		377	4		440					44	37	
Entry Volume, veh/h		370	4		431					44	37	
Circulating Flow (v_c), pc/h	48			0			421			440		
Exiting Flow (v_{ex}), pc/h	421			473			0			4		
Capacity (c_{pce}), pc/h		1314			1380					951	951	
Capacity (c), veh/h		1288			1353					951	951	
v/c Ratio (x)		0.29			0.32					0.05	0.04	

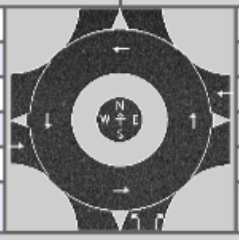
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.3			5.5					4.2	4.1	
Lane LOS		A	A		A					A	A	
95% Queue Length, Q_{95} (veh)		1.2			1.4					0.1	0.1	
95% Queue Length, Q_{95} (ft)		30.5			35.0					2.5	2.5	
Approach Delay, s/veh | LOS	5.3	A		5.5	A					4.2	A	
Intersection Delay, s/veh | LOS	5.3						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	5/13/2024
Analysis Year	2024
Time Analyzed	AM Peak
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.83
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			T				T		L		R					
Volume (V), veh/h	1		212		0		253		0	2		1				
Percent Heavy Vehicles, %	0		1		0		1		0	0		0				
Flow Rate (v_{PCE}), pc/h	1		258		0		308		0	2		1				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763		4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087		2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		259			308		2	1				
Entry Volume, veh/h		256			305		2	1				
Circulating Flow (v_c), pc/h	0			3			259			311		
Exiting Flow (v_{ex}), pc/h	259			311			0			0		
Capacity (c_{pce}), pc/h		1380			1376		1122	1122				
Capacity (c), veh/h		1366			1362		1122	1122				
v/c Ratio (x)		0.19			0.22		0.00	0.00				

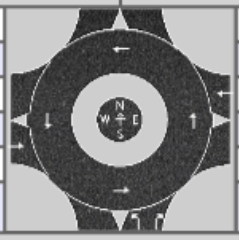
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			4.5		3.2	3.2				
Lane LOS		A			A		A	A				
95% Queue Length, Q_{95} (veh)		0.7			0.9		0.0	0.0				
95% Queue Length, Q_{95} (ft)		17.6			22.7		0.0	0.0				
Approach Delay, s/veh | LOS	4.2	A		4.5	A		3.2	A				
Intersection Delay, s/veh | LOS	4.4						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	AM Peak No Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.83
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			T				T		L		R					
Volume (V), veh/h	1		218		0		264		0	2		1				
Percent Heavy Vehicles, %	0		1		0		1		0	0		0				
Flow Rate (v_{PCE}), pc/h	1		265		0		321		0	2		1				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763		4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087		2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		266			321		2	1				
Entry Volume, veh/h		263			318		2	1				
Circulating Flow (v_c), pc/h	0			3			266			324		
Exiting Flow (v_{ex}), pc/h	266			324			0			0		
Capacity (c_{pce}), pc/h		1380			1376		1115	1115				
Capacity (c), veh/h		1366			1362		1115	1115				
v/c Ratio (x)		0.19			0.23		0.00	0.00				

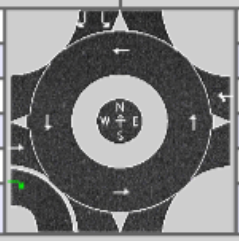
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			4.6		3.2	3.2				
Lane LOS		A			A		A	A				
95% Queue Length, Q_{95} (veh)		0.7			0.9		0.0	0.0				
95% Queue Length, Q_{95} (ft)		17.6			22.7		0.0	0.0				
Approach Delay, s/veh | LOS	4.2	A		4.6	A		3.2	A				
Intersection Delay, s/veh | LOS	4.4						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	AM Peak Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.86
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1
Lane Assignment			T				LT						L		R	
Volume (V), veh/h	0		269	37	0	21	245						0	41		34
Percent Heavy Vehicles, %	0		1	0	0	0	2						3	0		0
Flow Rate (v_{PCE}), pc/h	0		316	43	0	24	291						0	48		40
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763					4.5436	4.5436	
Follow-Up Headway, s		2.6087			2.6087					2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		316	43		315					48	40	
Entry Volume, veh/h		313	43		309					48	40	
Circulating Flow (v_c), pc/h	72			0			364			315		
Exiting Flow (v_{ex}), pc/h	364			331			0			24		
Capacity (c_{PCE}), pc/h		1282			1380					1066	1066	
Capacity (c), veh/h		1270			1355					1066	1066	
v/c Ratio (x)		0.25			0.23					0.05	0.04	

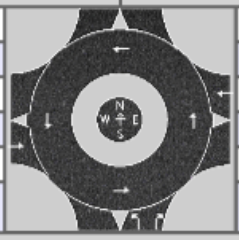
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			4.6					3.8	3.7	
Lane LOS		A	A		A					A	A	
95% Queue Length, Q_{95} (veh)		1.0			0.9					0.1	0.1	
95% Queue Length, Q_{95} (ft)		25.2			22.5					2.5	2.5	
Approach Delay, s/veh | LOS	4.4	A		4.6	A					3.7	A	
Intersection Delay, s/veh | LOS	4.4						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	5/13/2024
Analysis Year	2024
Time Analyzed	PM Peak
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			T				T		L		R					
Volume (V), veh/h	0		288		0		380		0	18		16				
Percent Heavy Vehicles, %	0		2		0		2		0	0		0				
Flow Rate (v_{PCE}), pc/h	0		309		0		408		0	19		17				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763		4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087		2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		309			408		19	17				
Entry Volume, veh/h		303			400		19	17				
Circulating Flow (v_c), pc/h	0			19			309			427		
Exiting Flow (v_{ex}), pc/h	326			427			0			0		
Capacity (c_{pce}), pc/h		1380			1354		1072	1072				
Capacity (c), veh/h		1353			1327		1072	1072				
v/c Ratio (x)		0.22			0.30		0.02	0.02				

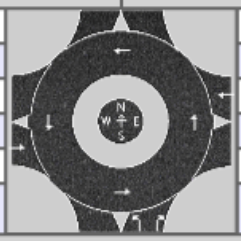
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.5			5.4		3.5	3.5				
Lane LOS		A			A		A	A				
95% Queue Length, Q_{95} (veh)		0.9			1.3		0.1	0.0				
95% Queue Length, Q_{95} (ft)		22.9			33.0		2.5	0.0				
Approach Delay, s/veh | LOS	4.5	A		5.4	A		3.5	A				
Intersection Delay, s/veh | LOS	5.0						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	PM Peak No Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			T				T		L		R					
Volume (V), veh/h	0		297		0		392		0	19		16				
Percent Heavy Vehicles, %	0		2		0		2		0	0		0				
Flow Rate (v_{PCE}), pc/h	0		319		0		421		0	20		17				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763		4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087		2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		319			421		20	17				
Entry Volume, veh/h		313			413		20	17				
Circulating Flow (v_c), pc/h	0			20			319			441		
Exiting Flow (v_{ex}), pc/h	336			441			0			0		
Capacity (c_{PCE}), pc/h		1380			1352		1062	1062				
Capacity (c), veh/h		1353			1326		1062	1062				
v/c Ratio (x)		0.23			0.31		0.02	0.02				

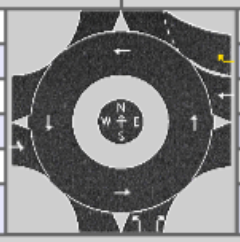
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			5.5		3.5	3.5				
Lane LOS		A			A		A	A				
95% Queue Length, Q_{95} (veh)		0.9			1.3		0.1	0.0				
95% Queue Length, Q_{95} (ft)		22.9			33.0		2.5	0.0				
Approach Delay, s/veh | LOS	4.6	A		5.5	A		3.5	A				
Intersection Delay, s/veh | LOS	5.0						A					

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	6/6/2024
Analysis Year	2027
Time Analyzed	PM Peak Build
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			LT				T		L		R					
Volume (V), veh/h	0	54	339		0		392	65	0	19		16				
Percent Heavy Vehicles, %	0	0	2		0		2	0	0	0		0				
Flow Rate (v_{PCE}), pc/h	0	57	364		0		421	68	0	20		17				
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763	4.9763	4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087	2.6087	2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		421			421	68	20	17				
Entry Volume, veh/h		414			413	68	20	17				
Circulating Flow (v_c), pc/h	0			77			421			441		
Exiting Flow (v_{ex}), pc/h	381			441			57			0		
Capacity (c_{pce}), pc/h		1380			1276	1302	968	968				
Capacity (c), veh/h		1357			1251	1302	968	968				
v/c Ratio (x)		0.31			0.33	0.05	0.02	0.02				

Delay and Level of Service

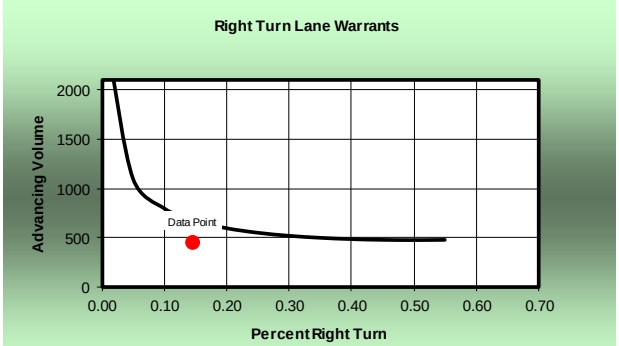
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.3			5.9	3.2	3.9	3.9				
Lane LOS		A			A	A	A	A				
95% Queue Length, Q_{95} (veh)		1.3			1.5	0.2	0.1	0.1				
95% Queue Length, Q_{95} (ft)		32.5			38.1	5.0	2.5	2.5				
Approach Delay, s/veh | LOS	5.3	A		5.5	A		3.9	A				
Intersection Delay, s/veh | LOS	5.4						A					

Right Turn Warrant at Entrance

Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	65	Speed Limit (mph)	35
Advancing Volume (vph)	449		

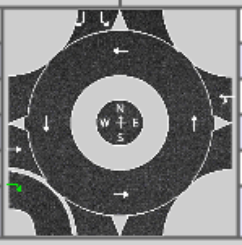


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	12/18/24
Analysis Year	2027
Time Analyzed	12:00 to 1:00 pm Saturday
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Ent
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Ent
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1
Lane Assignment			T				LT						L		R	
Volume (V), veh/h	0		189	380	0	253	302						0	42		35
Percent Heavy Vehicles, %	0		1	0	0	0	1						3	0		0
Flow Rate (v_{PCE}), pc/h	0		201	400	0	266	321						0	44		37
Right-Turn Bypass	Non-Yielding				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763					4.5436	4.5436	
Follow-Up Headway, s		2.6087			2.6087					2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		201	400		587					44	37	
Entry Volume, veh/h		199	400		584					44	37	
Circulating Flow (v_c), pc/h	310			0			245			587		
Exiting Flow (v_{ex}), pc/h	245			358			0			266		
Capacity (c_{pce}), pc/h		1006			1380					832	832	
Capacity (c), veh/h		996			1373					832	832	
v/c Ratio (x)		0.20			0.43					0.05	0.04	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.5			6.7					4.8	4.7	
Lane LOS		A	A		A					A	A	
95% Queue Length, Q_{95} (veh)		0.7			2.2					0.2	0.1	
95% Queue Length, Q_{95} (ft)		17.6			55.0					5.0	2.5	
Approach Delay, s/veh | LOS	1.8	A		6.7	A					4.8	A	
Intersection Delay, s/veh | LOS	4.3						A					

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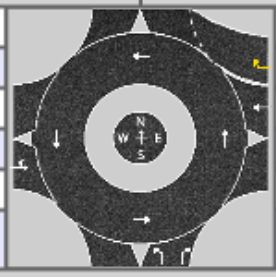
HCS Roundabouts Report

General Information

Analyst	DBZ
Agency or Co.	Diane B. Zimmerman Traffic...
Date Performed	12/18/24
Analysis Year	2027
Time Analyzed	12:00 to 1:00 pm Saturday
Project Description	Tennis Center



Site Information

Intersection	Trevillian Way at Zoo Exit
E/W Street Name	Trevillian Way
N/S Street Name	Zoo Exit
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.95
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0
Lane Assignment			LT				T		L		R					
Volume (V), veh/h	0	39	192		0		403	47	0	152		101				
Percent Heavy Vehicles, %	0	0	1		0		1	0	0	0		0				
Flow Rate (v_{PCE}), pc/h	0	41	204		0		428	49	0	160		106				
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763	4.9763	4.5436	4.5436				
Follow-Up Headway, s		2.6087			2.6087	2.6087	2.5352	2.5352				

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		245			428	49	160	106				
Entry Volume, veh/h		243			424	49	160	106				
Circulating Flow (v_c), pc/h	0			201			245			588		
Exiting Flow (v_{ex}), pc/h	310			588			41			0		
Capacity (c_{pce}), pc/h		1380			1124	1323	1136	1136				
Capacity (c), veh/h		1369			1113	1323	1136	1136				
v/c Ratio (x)		0.18			0.38	0.04	0.14	0.09				

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			7.1	3.0	4.4	4.0				
Lane LOS		A			A	A	A	A				
95% Queue Length, Q_{95} (veh)		0.6			1.8	0.1	0.5	0.3				
95% Queue Length, Q_{95} (ft)		15.0			45.4	2.5	12.5	7.5				
Approach Delay, s/veh | LOS	4.1	A		6.7	A		4.2	A				
Intersection Delay, s/veh | LOS	5.4						A					