final report

July 8, 2020
Revised February 16, 2021

Traffic Impact Study

Apartments
8000 Cedar Creek Road
Louisville, KY

Prepared for

Louisville Metro Planning Commission

STATE OF KENTUCKY
DIANE B. ZIMMERMAN
#16462
LICENSED
PROFESSIONAL ENGINEER

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INTRODUCTION

The development plan for an apartment community on Cedar Creek Road in Louisville, KY shows 324 apartment units. **Figure 1** displays a map of the site. Access to the community will be from two entrances on the Cedar Creek Road and a proposed access road. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of Bardstown Road with Cedar Creek Road and Southpointe Boulevard, the intersection of Cedar Creek Road at Cedar Garden Drive and the proposed entrances on Cedar Creek Road.

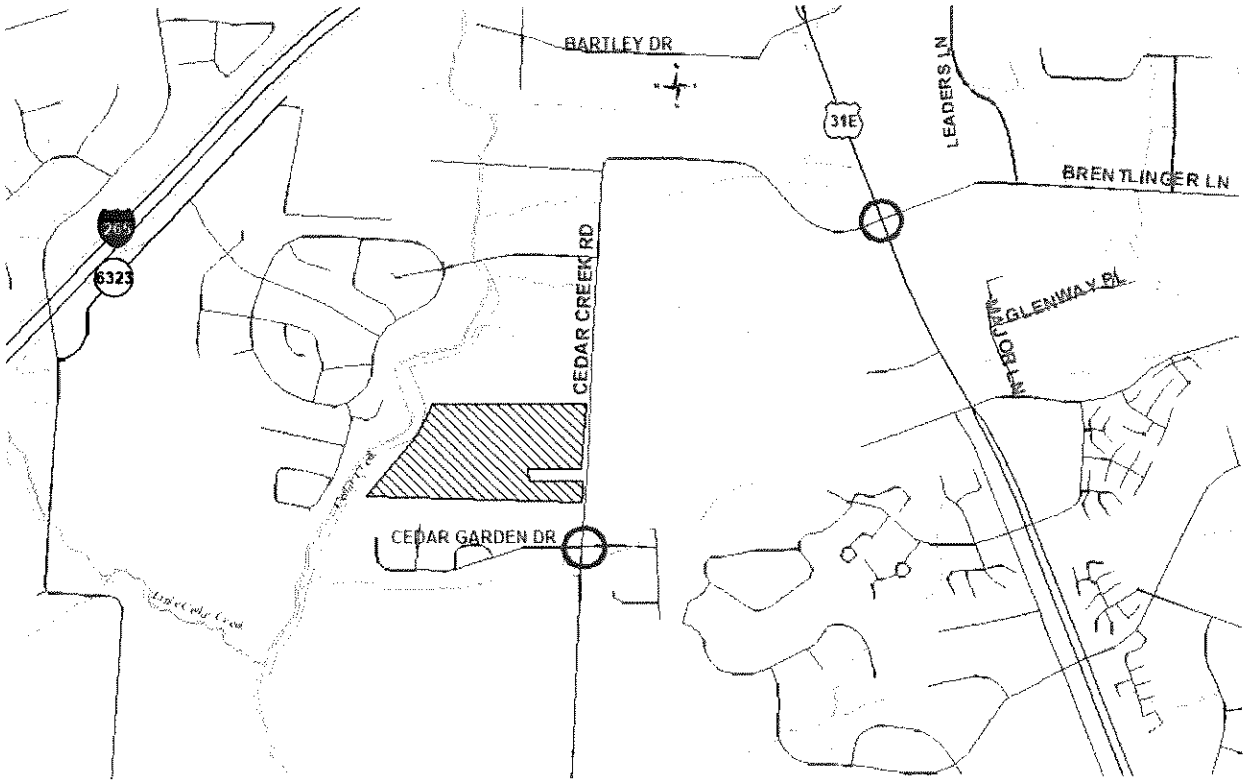

Figure 1. Site Map

EXISTING CONDITIONS

Cedar Creek Road, is a Metro-maintained road with an estimated 2020 ADT of 2,900 vehicles per day between the Bardstown Road and Gentry Lane, as estimated from the Kentucky Transportation 2019 count at station 316. The road has two ten-foot lanes with three-foot shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Bardstown Road is controlled with a traffic signal. There is a dedicated left turn lane on each approach at the intersection, and northbound Bardstown Road and westbound Brentlinger Lane have dedicated right turn lanes.

Peak hour traffic counts for the intersections were obtained on Tuesday, March 3, 2020. The a.m. peak hour on Cedar Creek Road was 7:00 to 8:00 and the p.m. peak hour was 4:45 to 5:45. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data for each intersection.

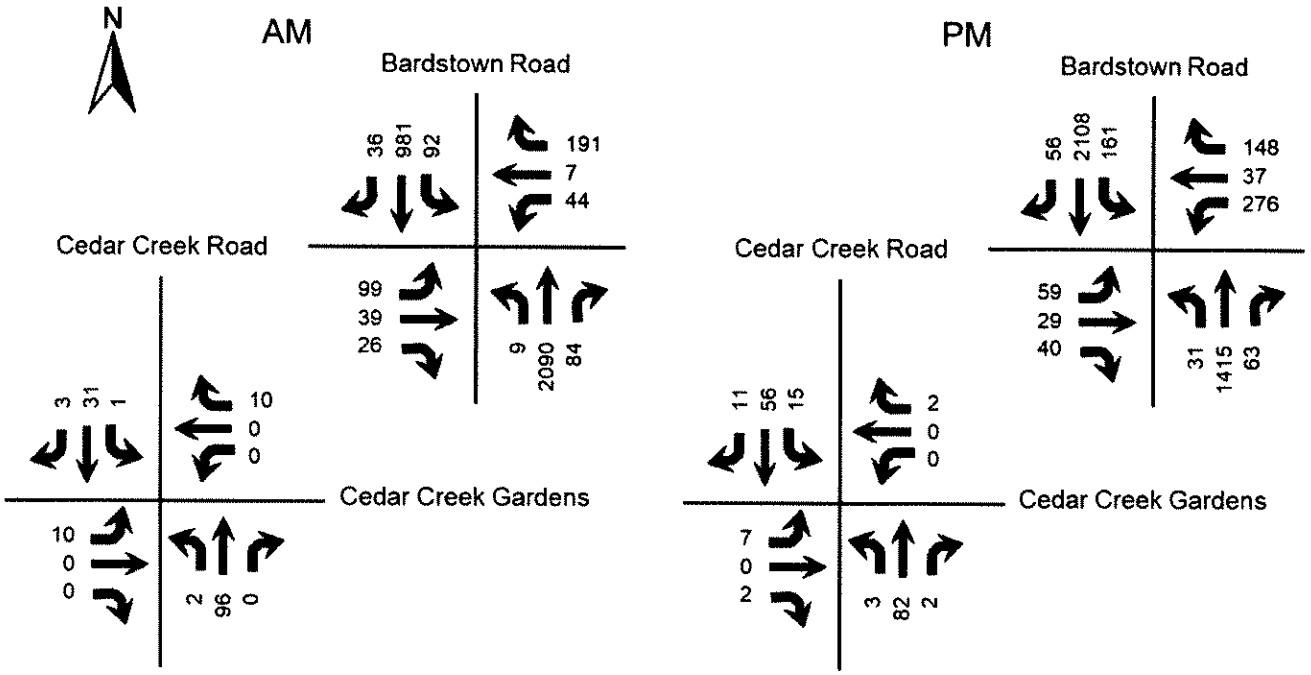

Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2023. An annual growth rate of 1.0 percent was applied to all 2020 volumes except Bardstown Road through traffic; 0.5 percent annual growth was used for Bardstown Road through traffic. This is determined by reviewing 2018 and 2015 counts at the intersection of Cedar Creek Road and Bardstown Road. Additionally, trip generation for 60 additional single-family homes in Cedar Creek Gardens, 88 single family homes on Heights Drive, 116 multifamily units on Brentlinger Lane, Southpointe Commons (approved development plan) and Bartley Drive Credit Union were included. **Figure 3** displays the 2023 No Build peak hour volumes.

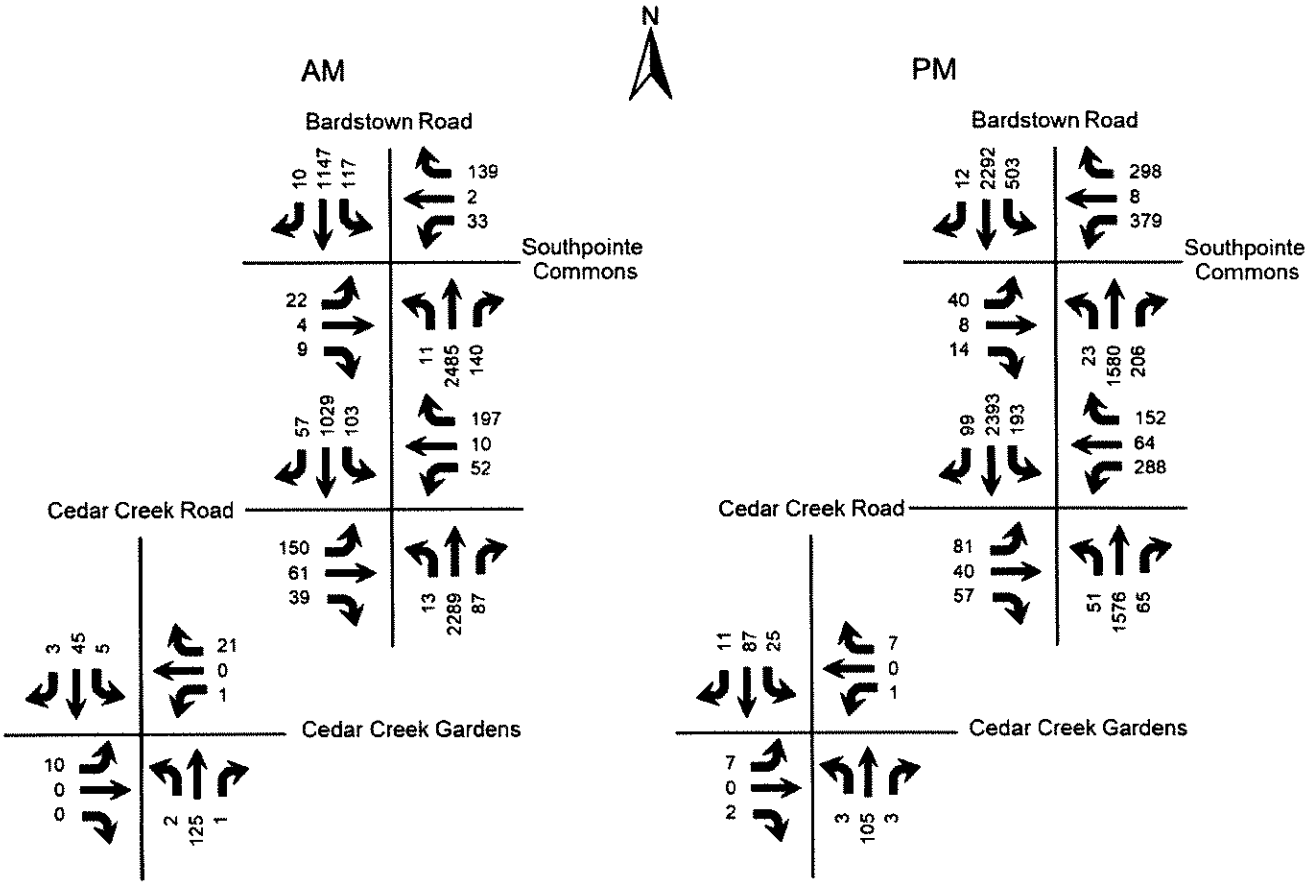

Figure 3. 2023 No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of developments. The land use of "Multifamily Housing Mid-Rise (221)" was 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. 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
Multifamily Housing Mid-Rise (324 units)	108	28	80	137	84	53

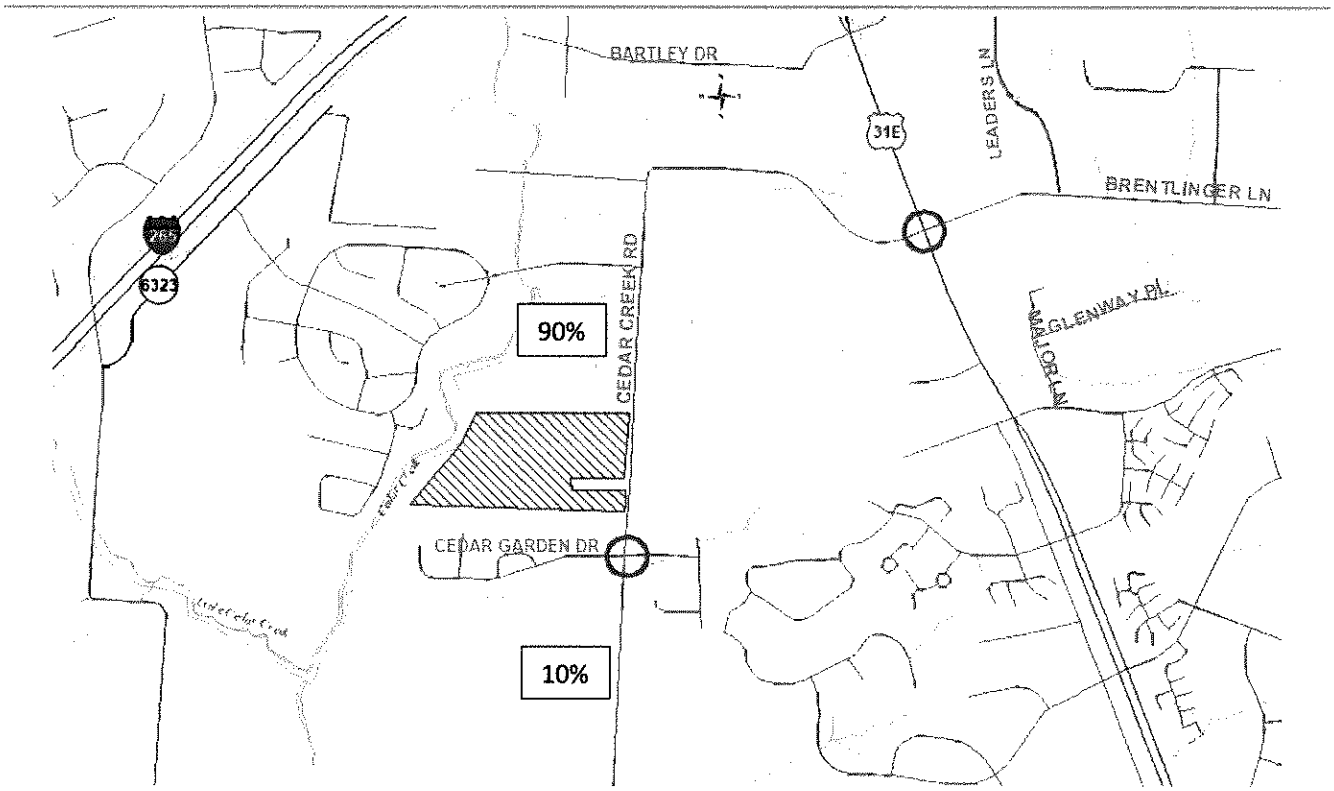

Figure 4. Trip Distribution Percentages

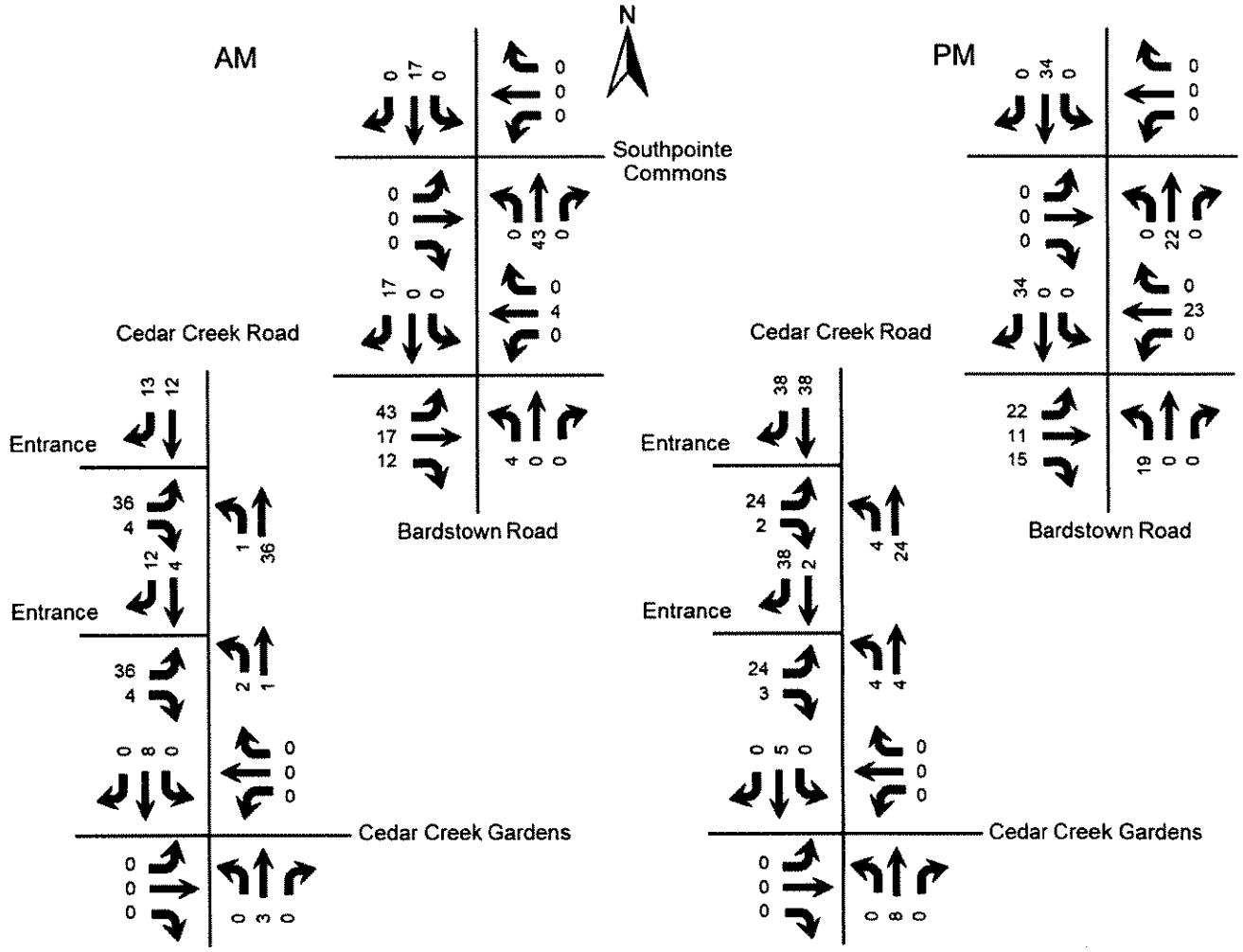

Figure 5. Peak Hour Trips Generated by Site

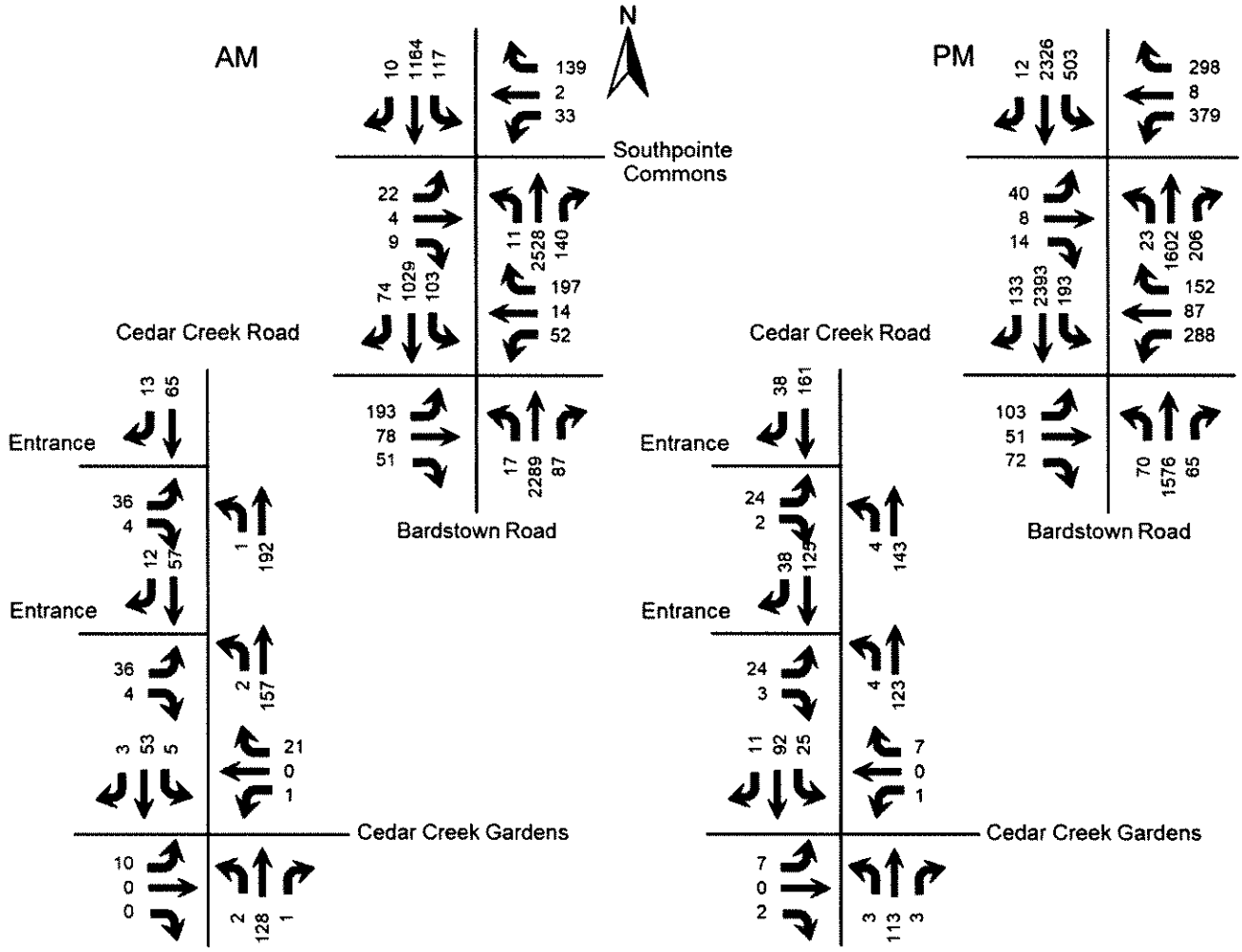

Figure 6. Build Peak Hour Volumes

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 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, 6th edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9) software. The delays and Level of Service are summarized in **Table 2**. The Build results include an eastbound right turn lane on Cedar Creek Road.

Table 2. Peak Hour Level of Service

Approach	A.M.			P.M.		
	2020 Existing	2023 No Build	2023 Build	2020 Existing	2023 No Build	2023 Build
Cedar Creek Road at Cedar Creek Gardens						
Cedar Creek Gardens Eastbound	A 9.5	B 10.1	B 10.2	A 9.6	B 10.2	B 10.3
Cedar Creek Gardens Westbound	A 8.8	A 9.1	A 9.1	A 8.7	A 9.1	A 9.1
Cedar Creek Road Northbound (left)	A 7.3	A 7.3	A 7.3	A 7.3	A 7.4	A 7.4
Cedar Creek Road Southbound (left)	A 7.4	A 7.5	A 7.5	A 7.4	A 7.5	A 7.5
Cedar Creek Road at South Entrance						
Entrance Eastbound			A 9.8			B 10.3
Cedar Creek Road Northbound (left)			A 7.3			A 7.6
Cedar Creek Road at North Entrance						
Entrance Eastbound			B 10.1			B 10.8
Cedar Creek Road Northbound (left)			A 7.4			A 7.6
Bardstown Road at Cedar Creek Road	**C 22.7**	**C 28.3**	**C 31.3**	**D 46.8**	**D 35.9**	**C 32.9**
Cedar Creek Road Eastbound	E 73.6	E 78.9	E 79.8	E 74.2	E 76.9	E 77.8
Brentlinger Lane Westbound	E 79.4	E 79.9	E 73.0	F 115.6	F 142.8	F 106.3
Bardstown Road Northbound	B 19.9	C 26.4	C 30.2	C 24.4	C 26.3	C 27.1
Bardstown Road Southbound	A 8.7	A 9.6	B 10.2	D 46.3	B 17.8	B 17.4
Bardstown Road at Bartley/Southpointe		**B 19.3**	**B 17.3**		**D 39.1**	**D 42.1**
Bartley Drive Eastbound		F 87.9	F 88.0		F 110.4	F 109.2
Southpointe Boulevard Westbound		E 77.5	E 79.7		F 83.7	F 87.6
Bardstown Road Northbound		B 11.9	B 11.5		B 14.7	B 16.3
Bardstown Road Southbound		C 24.9	B 18.7		D 42.2	D 46.2

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 September, 2020. Using the volumes in Figure 6, no turn lanes are required at the entrance. See the Appendix for the chart.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2023, there will be a minimal impact to the existing highway network, with the signalized intersections continuing to operate at acceptable levels of service. An eastbound right turn lane on Cedar Creek Road will be constructed.

APPENDIX

Traffic Counts

Jefferson County (Louisville), KY
Classified Turn Movement Count

Site 3 of 3
US-150 Bardstown Rd (North)
Brentinger Ln
US-150 Bardstown Rd (South)
Cedar Creek Rd

Lat/Long
38.134142°, -85.579609°

Weather
Fair
55°F

Date
Tuesday, March 3, 2020

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1229 South Shelby Street, Louisville, KY 40203
5565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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	Southbound US-150 Bardstown Rd (North)						Westbound Brentinger Ln						Northbound US-150 Bardstown Rd (South)						Eastbound Cedar Creek Rd						
	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	Int.
0700 - 0715	0	25	184	7	0	216	0	4	1	60	0	65	0	1	522	14	0	537	0	45	10	3	0	58	876
0715 - 0730	0	14	222	7	0	243	0	6	1	50	0	57	0	1	556	14	0	571	0	34	10	13	0	57	928
0730 - 0745	0	18	239	13	0	270	0	13	3	46	0	62	0	1	521	22	0	544	0	25	12	4	0	41	917
0745 - 0800	0	36	266	11	0	313	0	11	1	51	0	63	0	2	503	27	1	533	0	23	11	4	0	38	947
0800 - 0815	0	24	254	5	0	283	0	14	2	44	0	60	0	5	510	21	0	536	0	17	6	5	0	28	907
0815 - 0830	0	38	216	9	0	263	0	9	4	35	0	48	0	1	482	21	0	504	0	18	13	4	0	35	850
0830 - 0845	0	29	190	9	0	228	0	13	5	70	0	88	0	4	447	22	0	473	0	26	10	7	0	43	832
0845 - 0900	0	59	187	9	0	255	0	17	10	77	0	104	0	2	375	18	0	395	0	15	12	3	0	30	785
1600 - 1615	0	50	468	17	0	535	0	55	16	69	0	140	0	3	298	7	0	308	0	12	3	6	0	21	1004
1615 - 1630	0	41	509	11	0	561	0	70	9	37	0	116	0	7	350	12	0	369	0	19	8	8	0	35	1081
1630 - 1645	0	38	523	14	0	575	0	57	16	41	0	114	0	5	353	13	0	371	0	20	7	10	0	37	1097
1645 - 1700	0	35	489	14	0	538	0	69	5	35	0	109	1	8	349	16	0	374	0	12	6	12	0	30	1051
1700 - 1715	0	34	536	14	0	584	0	66	9	39	0	114	0	9	362	13	0	384	0	17	9	9	0	35	1117
1715 - 1730	0	48	534	14	0	596	0	69	13	38	0	120	0	6	359	19	0	384	0	8	6	11	0	25	1125
1730 - 1745	0	44	549	14	0	607	0	72	10	36	0	118	0	7	345	15	0	367	0	22	8	8	0	38	1130
1745 - 1800	0	49	441	20	0	510	0	60	19	26	0	105	0	6	318	19	0	343	0	15	4	6	0	25	983

0715 - 0730	0	14	222	7	0	243	0	6	1	50	0	57	0	1	556	14	0	571	0	34	10	13	0	57	928
0730 - 0745	0	18	239	13	0	270	0	13	3	46	0	62	0	1	521	22	0	544	0	25	12	4	0	41	917
0745 - 0800	0	36	266	11	0	313	0	11	1	51	0	63	0	2	503	27	1	533	0	23	11	4	0	38	947
0800 - 0815	0	24	254	5	0	283	0	14	2	44	0	60	0	5	510	21	0	536	0	17	6	5	0	28	907
AM PEAK	**0**	**92**	**981**	**36**	**0**	**1109**	**0**	**44**	**7**	**191**	**0**	**242**	**0**	**9**	**2090**	**84**	**1**	**2184**	**0**	**99**	**39**	**26**	**0**	**164**	**3699**
1645 - 1700	0	35	489	14	0	538	0	69	5	35	0	109	1	8	349	16	0	374	0	12	6	12	0	30	1051
1700 - 1715	0	34	536	14	0	584	0	66	9	39	0	114	0	9	362	13	0	384	0	17	9	9	0	35	1117
1715 - 1730	0	48	534	14	0	596	0	69	13	38	0	120	0	6	359	19	0	384	0	8	6	11	0	25	1125
1730 - 1745	0	44	549	14	0	607	0	72	10	36	0	118	0	7	345	15	0	367	0	22	8	8	0	38	1130
PM PEAK	**0**	**161**	**2186**	**56**	**0**	**2325**	**0**	**276**	**37**	**148**	**0**	**461**	**1**	**30**	**1415**	**63**	**0**	**1509**	**0**	**59**	**29**	**40**	**0**	**128**	**4423**

Jefferson County (Louisville), KY
Classified Turn Movement Count

Site 2 of 3
Cedar Creek Rd (North)
Cedar Garden Dr (East)
Cedar Creek Rd (South)
Cedar garden Dr (West)

Lat/Long
38.127684°, -85.587208°

Weather
Fair
55°F

Date
Tuesday, March 3, 2020

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1229 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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	Southbound						Westbound						Northbound						Eastbound						
	Cedar Creek Rd (North)						Cedar Garden Dr (East)						Cedar Creek Rd (South)						Cedar garden Dr (West)						
	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	Int.
0700 - 0715	0	0	5	0	0	5	0	0	0	4	0	4	0	0	31	0	0	31	0	3	0	0	0	3	43
0715 - 0730	1	0	4	2	0	7	0	0	0	0	0	0	0	1	30	0	0	31	0	3	0	0	0	3	41
0730 - 0745	0	0	15	0	0	15	0	0	0	4	0	4	0	0	19	0	0	19	0	2	0	0	0	2	40
0745 - 0800	0	1	7	1	0	9	0	0	0	2	0	2	0	1	16	0	0	17	0	2	0	0	0	2	30
0800 - 0815	0	2	7	0	0	9	0	0	0	0	0	0	0	0	16	0	0	16	0	1	0	2	0	3	30
0815 - 0830	0	1	8	0	0	9	0	1	0	2	0	3	0	0	15	0	0	15	0	1	0	0	0	1	28
0830 - 0845	0	1	9	1	0	11	0	0	0	1	0	1	0	0	17	1	0	18	0	3	0	1	0	4	34
0845 - 0900	0	3	10	0	0	13	0	0	0	0	0	0	0	0	18	0	0	18	0	1	0	0	0	1	32
1600 - 1615	0	1	21	2	0	24	0	0	0	1	0	1	0	1	10	0	0	11	0	2	0	0	0	2	38
1615 - 1630	0	1	17	2	1	21	0	1	0	1	0	2	0	2	20	2	0	24	0	2	0	2	0	4	51
1630 - 1645	0	0	11	5	0	16	0	0	0	1	0	1	0	2	21	0	0	23	0	0	0	0	0	0	40
1645 - 1700	0	3	19	4	0	26	0	0	0	0	0	0	0	1	19	1	0	21	0	2	0	0	0	2	49
1700 - 1715	0	1	10	1	0	12	0	0	0	2	0	2	0	1	22	0	0	23	0	2	0	0	0	2	39
1715 - 1730	0	8	12	3	0	23	0	0	0	0	0	0	0	0	16	1	0	17	0	2	0	1	0	3	43
1730 - 1745	0	3	15	3	0	21	0	0	0	0	0	0	0	1	25	0	0	26	0	1	0	1	0	2	49
1745 - 1800	0	5	20	3	0	28	0	0	0	1	0	1	0	2	14	1	0	17	0	2	0	0	0	2	48

0700 - 0715	0	0	5	0	0	5	0	0	0	4	0	4	0	0	31	0	0	31	0	3	0	0	0	3	43
0715 - 0730	1	0	4	2	0	7	0	0	0	0	0	0	0	1	30	0	0	31	0	3	0	0	0	3	41
0730 - 0745	0	0	15	0	0	15	0	0	0	4	0	4	0	0	19	0	0	19	0	2	0	0	0	2	40
0745 - 0800	0	1	7	1	0	9	0	0	0	2	0	2	0	1	16	0	0	17	0	2	0	0	0	2	30
AM PEAK	1	1	31	3	0	36	0	0	0	10	0	10	0	2	96	0	0	98	0	10	0	0	0	10	154
1645 - 1700	0	3	19	4	0	26	0	0	0	0	0	0	0	1	19	1	0	21	0	2	0	0	0	2	49
1700 - 1715	0	1	10	1	0	12	0	0	0	2	0	2	0	1	22	0	0	23	0	2	0	0	0	2	39
1715 - 1730	0	8	12	3	0	23	0	0	0	0	0	0	0	0	16	1	0	17	0	2	0	1	0	3	43
1730 - 1745	0	3	15	3	0	21	0	0	0	0	0	0	0	1	25	0	0	26	0	1	0	1	0	2	49
PM PEAK	0	15	56	11	0	82	0	0	0	2	0	2	0	3	82	2	0	87	0	7	0	2	0	9	180

Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	4	Speed Limit (mph)	35
Advancing Volume (vph)	147	No. of through lanes	1
Opposing Volume (vph)	199	Percent Heavy Vehicles (decimal percent)	0.01

Left Turn Lane NOT Warranted

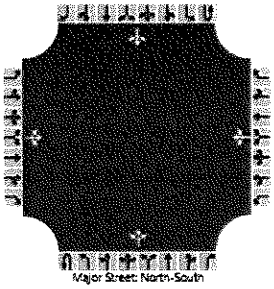
Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

HCS Reports

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2020	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		0	0	10		2	96	0		1	31	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

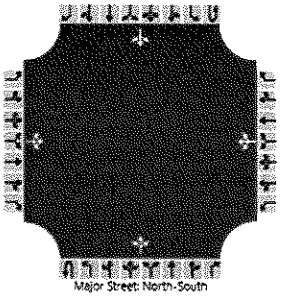
Flow Rate, v (veh/h)			11				11			2				1		
Capacity, c (veh/h)			805				953			1586				1497		
v/c Ratio			0.01				0.01			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.0		
Control Delay (s/veh)			9.5				8.8			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.5				8.8				0.2				0.2		
Approach LOS		A				A										

HCS™ TWSC Version 7.8.5
CCG AM 20.xtw
Generated: 7/8/2020 5:56:29 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		1	0	21		2	125	1		5	45	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11				24			2				6		
Capacity, c (veh/h)			720				905			1565				1456		
v/c Ratio			0.02				0.03			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.1			0.0				0.0		
Control Delay (s/veh)			10.1				9.1			7.3				7.5		
Level of Service (LOS)			B				A			A				A		
Approach Delay (s/veh)		10.1				9.1				0.1				0.7		
Approach LOS		B				A										

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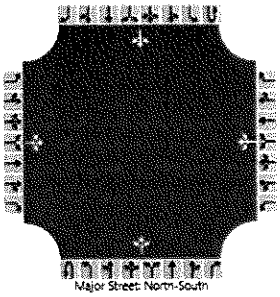
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak Build	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		1	0	21		2	128	1		5	53	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11				24			2				6		
Capacity, c (veh/h)			707				901			1554				1452		
v/c Ratio			0.02				0.03			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.1			0.0				0.0		
Control Delay (s/veh)			10.2				9.1			7.3				7.5		
Level of Service (LOS)			B				A			A				A		
Approach Delay (s/veh)	10.2				9.1				0.1				0.6			
Approach LOS	B				A											

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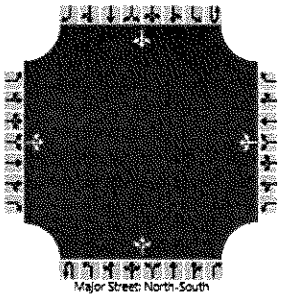
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2020	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		0	0	2		3	82	2		15	56	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				2			3				16		
Capacity, c (veh/h)			800				973			1540				1516		
v/c Ratio			0.01				0.00			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.0		
Control Delay (s/veh)			9.6				8.7			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.6				8.7				0.3				1.4		
Approach LOS		A				A										

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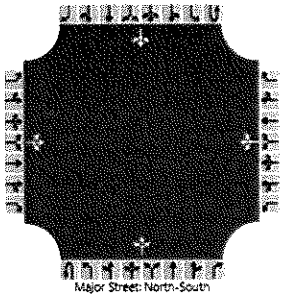
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		1	0	7		3	105	3		25	87	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				9			3				27		
Capacity, c (veh/h)			708				895			1497				1484		
v/c Ratio			0.01				0.01			0.00				0.02		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.1		
Control Delay (s/veh)			10.2				9.1			7.4				7.5		
Level of Service (LOS)			B				A			A				A		
Approach Delay (s/veh)		10.2				9.1				0.2				1.6		
Approach LOS		B				A										

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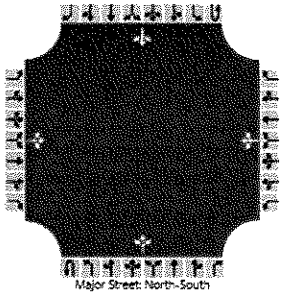
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/20	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak Build	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		1	0	7		3	113	3		25	92	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				9			3				27		
Capacity, c (veh/h)			695				884			1490				1473		
v/c Ratio			0.01				0.01			0.00				0.02		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.1		
Control Delay (s/veh)			10.3				9.1			7.4				7.5		
Level of Service (LOS)			B				A			A				A		
Approach Delay (s/veh)		10.3				9.1				0.2				1.6		
Approach LOS		B				A										

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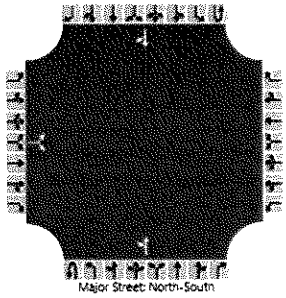
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek at Entrance
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Entrance
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apt		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		36		4						2	157				12	57
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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			44							2						
Capacity, c (veh/h)			788							1535						
v/c Ratio			0.06							0.00						
95% Queue Length, Q_{95} (veh)			0.2							0.0						
Control Delay (s/veh)			9.8							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.8								0.1							
Approach LOS	A															

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HCS7 Two-Way Stop-Control Report

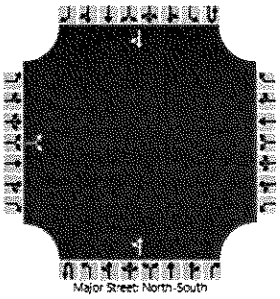
General Information

Analyst	DBZ
Agency/Co.	Diane B Zimmerman Traffic Engineering
Date Performed	2/16/21
Analysis Year	2023
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Hagan Apt

Site Information

Intersection	Cedar Creek at Entrance
Jurisdiction	
East/West Street	Entrance
North/South Street	Cedar Creek Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		24		3						4	123				125	38
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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			29							4						
Capacity, c (veh/h)			712							1411						
v/c Ratio			0.04							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			10.3							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.3								0.3							
Approach LOS	B															

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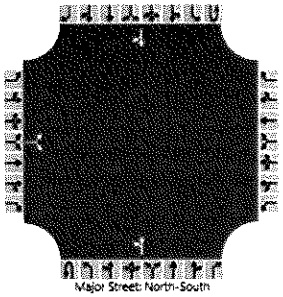
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek at Entrance N
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Entrance
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apt		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		36		4						1	192				13	65
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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			44							1						
Capacity, c (veh/h)			748							1522						
v/c Ratio			0.06							0.00						
95% Queue Length, Q_{95} (veh)			0.2							0.0						
Control Delay (s/veh)			10.1							7.4						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.1								0.0							
Approach LOS	B															

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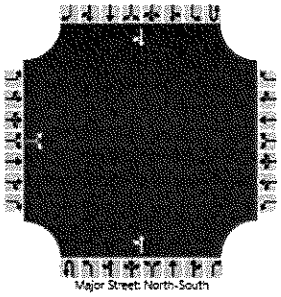
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek at Entrance N
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	2/16/21	East/West Street	Entrance
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apt		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		24		2						4	143				161	38
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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28							4						
Capacity, c (veh/h)			653							1365						
v/c Ratio			0.04							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			10.8							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.8								0.2							
Approach LOS	B															

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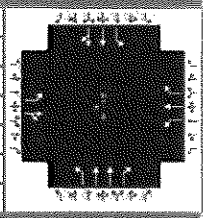
HCS7 Signalized Intersection Results Summary

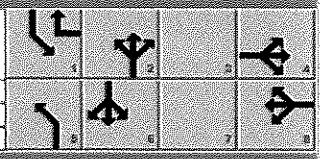
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 6, 2020	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2020	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 20.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	99	39	26	44	7	191	9	2090	84	92	981	36

Signal Information			
Cycle, s	180.0	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	2.2	3.7	129.9	24.2	0.0	0.0	
Yellow	3.5	0.0	5.1	3.6	0.0	0.0	
Red	3.0	0.0	1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		30.8		30.8	8.7	136.7	12.5	140.5
Change Period, (*Y+R c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*g s*), s		14.9		23.2	2.3		4.5	
Green Extension Time (*g e*), s		1.9		1.0	0.0	0.0	0.3	0.0
Phase Call Probability		1.00		1.00	0.37		0.99	
Max Out Probability		0.07		0.99	0.00		0.00	

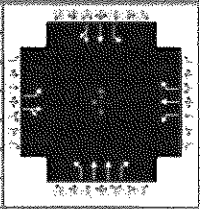
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	101	66		45	7	195	9	2133	86	96	534	527
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1386	1717		1282	1900	1572	1344	1781	1610	1781	1841	1817
Queue Service Time (*g s*), s	12.3	6.3		5.9	0.6	21.2	0.3	74.8	1.5	2.5	12.6	12.5
Cycle Queue Clearance Time (*g c*), s	12.9	6.3		12.1	0.6	21.2	0.3	74.8	1.5	2.5	12.6	12.5
Green Ratio (*g/C*)	0.13	0.13		0.13	0.13	0.17	0.73	0.72	0.86	0.75	0.74	0.74
Capacity (*c*), veh/h	222	231		168	256	264	322	2570	1379	157	1367	1349
Volume-to-Capacity Ratio (*X*)	0.455	0.287		0.267	0.028	0.739	0.029	0.830	0.062	0.612	0.391	0.391
Back of Queue (*Q*), ft/ln (95 th percentile)	204.7	130.1		94.3	13	360.8	5.4	951.7	43.5	157.9	190.5	184.4
Back of Queue (*Q*), veh/ln (95 th percentile)	7.9	5.0		3.6	0.5	14.1	0.2	37.5	1.7	6.2	7.4	7.3
Queue Storage Ratio (*RQ*) (95 th percentile)	1.36	0.13		0.31	0.04	1.60	0.03	1.36	0.22	0.79	0.27	0.27
Uniform Delay (*d 1*), s/veh	73.2	70.1		75.6	67.6	71.2	6.7	17.4	2.0	37.8	4.8	4.8
Incremental Delay (*d 2*), s/veh	2.1	1.0		1.2	0.1	9.2	0.1	3.3	0.1	5.1	0.8	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	0.0
Control Delay (*d*), s/veh	75.3	71.1		76.8	67.7	80.4	6.8	20.6	2.0	42.9	5.6	5.6
Level of Service (LOS)	E	E		E	E	F	A	C	A	D	A	A
Approach Delay, s/veh / LOS	73.6	E		79.4	E		19.9	B		8.7	A	
Intersection Delay, s/veh / LOS	22.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.07	B	1.87	B
Bicycle LOS Score / LOS	0.76	A	0.90	A	2.33	B	1.42	A

 HCS™ Streets Version 7.8.5 Generated: 7/10/2020 3:46:37 PM

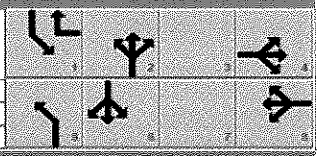
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 23 NB.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	150	61	39	52	10	197	13	2289	87	103	1029	57

Signal Information					EB			WB			NB		
Cycle, s	180.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	2.9	3.1		129.1	25.1	0.0	0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	0.0		5.1	3.6	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		31.7		31.7	9.4	135.9	12.5	138.9
Change Period, (*Y+R c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*g s*), s		22.2		23.8	2.5		5.4	
Green Extension Time (*g e*), s		1.5		1.2	0.0	0.0	0.3	0.0
Phase Call Probability		1.00		1.00	0.48		0.99	
Max Out Probability		0.77		1.00	0.00		0.01	

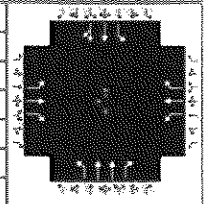
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	153	102		53	10	201	13	2336	89	101	537	527
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1382	1720		1241	1900	1572	1344	1781	1610	1781	1841	1806
Queue Service Time (*g s*), s	19.4	9.8		7.4	0.8	21.8	0.5	97.0	1.5	3.4	9.6	9.5
Cycle Queue Clearance Time (*g c*), s	20.2	9.8		17.1	0.8	21.8	0.5	97.0	1.5	3.4	9.6	9.5
Green Ratio (*g/C*)	0.14	0.14		0.14	0.14	0.17	0.73	0.72	0.86	0.75	0.73	0.73
Capacity (*c*), veh/h	226	239		145	264	271	329	2554	1379	126	1351	1326
Volume-to-Capacity Ratio (*X*)	0.677	0.426		0.365	0.039	0.742	0.040	0.915	0.064	0.798	0.398	0.398
Back of Queue (*Q*), ft/ln (95 th percentile)	302.3	202.1		115.3	18.5	370.5	7.8	1229.7	46.4	175.8	139	131.7
Back of Queue (*Q*), veh/ln (95 th percentile)	11.7	7.8		4.4	0.7	14.5	0.2	48.4	1.9	6.9	5.4	5.2
Queue Storage Ratio (*RQ*) (95 th percentile)	2.02	0.20		0.38	0.06	1.65	0.04	1.76	0.23	0.88	0.20	0.19
Uniform Delay (*d 1*), s/veh	75.8	70.9		78.7	67.1	70.7	6.7	20.9	2.0	52.8	3.4	3.3
Incremental Delay (*d 2*), s/veh	7.3	1.7		2.2	0.1	9.6	0.1	6.5	0.1	13.8	0.8	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	0.0
Control Delay (*d*), s/veh	83.1	72.6		80.9	67.1	80.3	6.7	27.4	2.1	66.6	4.2	4.2
Level of Service (LOS)	F	E		F	E	F	A	C	A	E	A	A
Approach Delay, s/veh / LOS	78.9	E		79.9	E		26.4	C		9.6	A	
Intersection Delay, s/veh / LOS	28.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.07	B	1.87	B
Bicycle LOS Score / LOS	0.91	A	0.92	A	2.50	B	1.49	A

 HCS™ Streets Version 7.9 Generated: 2/17/2021 12:19:49 PM

HCS7 Signalized Intersection Results Summary

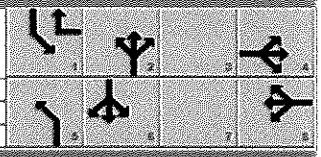
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 16, 2021	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 23 B R.xus		
Project Description	Cedar Creek Apt Right				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	193	78	51	52	14	197	17	2289	87	103	1029	74

Signal Information			
Cycle, s	180.0	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	3.5	2.7	125.5	28.4	0.0	0.0	
Yellow	3.5	0.0	5.1	3.6	0.0	0.0	
Red	3.0	0.0	1.7	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		5.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		35.0		35.0	10.0	132.3	12.7	135.0
Change Period, (*Y+R_c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*g_s*), s		28.5		23.3	2.7		6.0	
Green Extension Time (*g_e*), s		0.0		1.6	0.0	0.0	0.2	0.0
Phase Call Probability		1.00		1.00	0.58		0.99	
Max Out Probability		1.00		1.00	0.00		0.15	

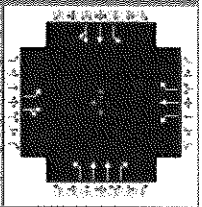
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	197	80	52	53	14	201	17	2336	89	100	540	527
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1377	1841	1610	1267	1900	1572	1344	1781	1610	1781	1841	1797
Queue Service Time (*g_s*), s	25.3	6.8	5.1	6.9	1.1	21.3	0.7	101.9	1.5	4.0	9.5	9.3
Cycle Queue Clearance Time (*g_c*), s	26.5	6.8	5.1	13.7	1.1	21.3	0.7	101.9	1.5	4.0	9.5	9.3
Green Ratio (*g/C*)	0.16	0.16	0.16	0.16	0.16	0.19	0.72	0.70	0.86	0.73	0.71	0.71
Capacity (*c*), veh/h	256	301	254	192	300	302	324	2503	1377	121	1311	1280
Volume-to-Capacity Ratio (*X*)	0.769	0.265	0.205	0.276	0.048	0.665	0.053	0.933	0.064	0.822	0.412	0.412
Back of Queue (*Q*), ft/ln (95 th percentile)	390.8	152.2	96	110.4	25.6	359.7	10.8	1288.9	49.5	225.4	134.5	125.8
Back of Queue (*Q*), veh/ln (95 th percentile)	15.1	5.9	3.8	4.2	1.0	14.0	0.3	50.7	2.0	8.9	5.2	5.0
Queue Storage Ratio (*RQ*) (95 th percentile)	2.61	0.15	0.00	0.37	0.09	1.60	0.05	1.64	0.25	1.13	0.19	0.18
Uniform Delay (*d₁*), s/veh	74.6	65.8	66.0	72.7	64.3	67.3	7.6	23.5	2.0	56.1	3.5	3.4
Incremental Delay (*d₂*), s/veh	14.0	0.7	0.6	1.1	0.1	6.1	0.1	7.9	0.1	17.1	0.9	0.9
Initial Queue Delay (*d₃*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	88.6	66.5	66.5	73.8	64.4	73.5	7.6	31.4	2.1	73.2	4.4	4.3
Level of Service (LOS)	F	E	E	E	E	E	A	C	A	E	A	A
Approach Delay, s/veh / LOS	79.8	E		73.0	E		30.2	C		10.2	B	
Intersection Delay, s/veh / LOS	31.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.32	B	2.07	B	2.07	B
Bicycle LOS Score / LOS	1.03	A	0.93	A	2.50	C	1.50	B

 HCS™ Streets Version 7.9 Generated: 2/16/2021 2:31:21 PM

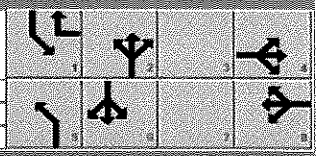
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 10, 2020	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2020	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 20.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	59	29	40	276	37	148	31	1415	63	161	2108	56

Signal Information										
Cycle, s	225.0	Reference Phase	2							
Offset, s	0	Reference Point	End							
Uncoordinated	No	Simult. Gap E/W	On	Green	5.2	5.3	146.2	46.4	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	5.1	3.6	0.0	0.0
				Red	3.0	0.0	1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	11.7	153.0	17.0	158.3
Change Period, (*Y+R_c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.1		5.1	5.0	0.0	5.0	0.0
Queue Clearance Time (g_s), s		13.9		51.4	3.3		10.0	
Green Extension Time (g_e), s		3.7		0.0	0.1	0.0	0.5	0.0
Phase Call Probability		1.00		1.00	0.86		1.00	
Max Out Probability		0.00		1.00	0.00		0.14	

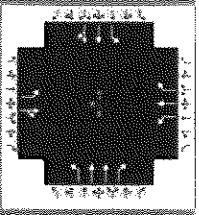
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	60	70		282	38	151	32	1444	64	186	1251	1251
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1370	1680		1351	1900	1610	1810	1781	1572	1810	1885	1868
Queue Service Time (g_s), s	8.3	7.7		41.7	3.6	17.2	1.3	53.7	1.3	8.0	142.5	146.6
Cycle Queue Clearance Time (g_c), s	11.9	7.7		49.4	3.6	17.2	1.3	53.7	1.3	8.0	142.5	146.6
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22	0.26	0.67	0.65	0.86	0.70	0.68	0.68
Capacity (*c*), veh/h	305	361		282	409	421	75	2314	1360	271	1278	1266
Volume-to-Capacity Ratio (*X*)	0.197	0.195		0.998	0.092	0.358	0.420	0.624	0.047	0.688	0.979	0.988
Back of Queue (*Q*), ft/ln (95 th percentile)	135.5	155.7		705.3	79.6	289.4	57.7	774.2	57.8	168.3	1881.6	1937.1
Back of Queue (*Q*), veh/ln (95 th percentile)	5.3	6.1		28.2	3.2	11.6	2.3	30.5	2.3	6.7	74.7	76.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.90	0.16		2.35	0.27	1.29	0.29	1.11	0.29	0.84	2.35	2.40
Uniform Delay (d_1), s/veh	75.5	72.3		94.0	70.3	67.7	59.7	23.2	2.1	23.7	33.5	33.3
Incremental Delay (d_2), s/veh	0.4	0.4		52.9	0.1	0.7	5.2	1.3	0.1	2.8	13.5	15.3
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	0.0
Control Delay (*d*), s/veh	75.9	72.7		146.9	70.5	68.4	64.9	24.5	2.2	26.5	47.0	48.6
Level of Service (LOS)	E	E		F	E	E	E	C	A	C	D	D
Approach Delay, s/veh / LOS	74.2	E		115.6	F		24.4	C		46.3	D	
Intersection Delay, s/veh / LOS	46.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	1.90	B
Bicycle LOS Score / LOS	0.70	A	1.26	A	1.76	B	2.44	B

 HCS™ Streets Version 7.8.6 Generated: 7/10/2020 5:07:03 PM

HCS7 Signalized Intersection Results Summary

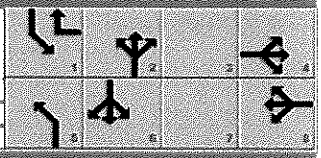
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 23 NB.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	81	40	57	288	64	152	51	1576	65	193	2393	99

Signal Information			
Cycle, s	225.0	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	5.8	4.0	146.9	48.4	0.0	0.0
Yellow	3.5	0.0	5.1	3.6	0.0	0.0
Red	3.0	0.0	1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	12.3	153.7	16.3	157.7
Change Period, (*Y+R_c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*g_s*), s		20.3		51.4	4.1		9.2	
Green Extension Time (*g_e*), s		4.3		0.0	0.1	0.0	0.6	0.0
Phase Call Probability		1.00		1.00	0.96		1.00	
Max Out Probability		0.01		1.00	0.00		0.09	

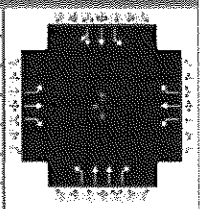
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	83	99		294	65	155	52	1608	66	183	1178	1178
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1336	1678		1317	1900	1610	1810	1781	1572	1810	1885	1859
Queue Service Time (*g_s*), s	12.1	11.1		38.3	6.3	17.8	2.1	64.3	1.3	7.2	100.3	106.4
Cycle Queue Clearance Time (*g_c*), s	18.3	11.1		49.4	6.3	17.8	2.1	64.3	1.3	7.2	100.3	106.4
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22	0.26	0.68	0.65	0.67	0.70	0.68	0.68
Capacity (*c*), veh/h	282	361		256	409	416	107	2326	1365	228	1273	1255
Volume-to-Capacity Ratio (*X*)	0.293	0.274		1.147	0.160	0.373	0.484	0.691	0.049	0.800	0.926	0.939
Back of Queue (*Q*), ft/ln (95 th percentile)	192.9	216.2		810.3	139.8	297.6	93.7	905.5	59	212.2	824.7	850.9
Back of Queue (*Q*), veh/ln (95 th percentile)	7.6	8.4		32.4	5.6	11.9	3.7	35.6	2.3	8.5	32.7	33.5
Queue Storage Ratio (*RQ*) (95 th percentile)	1.29	0.22		2.70	0.47	1.32	0.47	1.29	0.29	1.06	1.03	1.06
Uniform Delay (*d₁*), s/veh	79.2	73.7		95.7	71.4	68.4	48.1	24.7	2.0	35.4	13.8	13.6
Incremental Delay (*d₂*), s/veh	0.8	0.6		101.6	0.3	0.8	4.7	1.7	0.1	2.0	2.4	2.9
Initial Queue Delay (*d₃*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	80.0	74.2		197.4	71.6	69.2	52.8	26.4	2.1	37.5	16.1	16.5
Level of Service (LOS)	F	E		F	E	E	D	C	A	D	B	B
Approach Delay, s/veh / LOS	76.9	E		142.8	F		26.3	C		17.8	B	
Intersection Delay, s/veh / LOS	35.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	1.90	B
Bicycle LOS Score / LOS	0.79	A	1.34	A	1.91	B	2.75	C

 HCS™ Streets Version 7.9 Generated: 2/17/2021 2:10:34 PM

HCS7 Signalized Intersection Results Summary

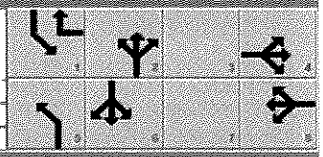
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 23 B R.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	103	51	72	288	87	152	70	1576	65	193	2393	133

Signal Information			
Cycle, s	225.0	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	5.9	3.8	147.0	48.4	0.0	0.0	
Yellow	3.5	0.0	5.1	3.6	0.0	0.0	
Red	3.0	0.0	1.7	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		5.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	12.4	153.8	16.2	157.6
Change Period, (*Y+R c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*g s*), s		26.8		51.4	5.0		9.2	
Green Extension Time (*g e*), s		4.6		0.0	0.2	0.0	0.5	0.0
Phase Call Probability		1.00		1.00	0.99		1.00	
Max Out Probability		0.06		1.00	0.00		0.09	

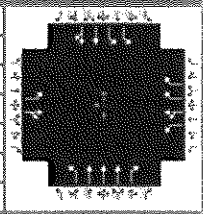
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	105	52	73	294	89	155	71	1608	66	182	1191	1191
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1308	1856	1610	1374	1900	1610	1810	1781	1572	1810	1885	1850
Queue Service Time (*g s*), s	16.2	5.1	8.4	44.3	8.7	17.8	3.0	64.3	1.3	7.2	104.4	113.8
Cycle Queue Clearance Time (*g c*), s	24.8	5.1	8.4	49.4	8.7	17.8	3.0	64.3	1.3	7.2	104.4	113.8
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.26	0.68	0.65	0.87	0.70	0.67	0.67
Capacity (*c*), veh/h	263	399	346	303	409	416	103	2326	1365	228	1272	1248
Volume-to-Capacity Ratio (*X*)	0.400	0.130	0.212	0.971	0.217	0.373	0.694	0.691	0.049	0.798	0.936	0.954
Back of Queue (*Q*), ft/ln (95 th percentile)	241.8	114.4	161	717.2	193.3	300.1	133.6	896.3	58.3	201	765.1	793.3
Back of Queue (*Q*), veh/ln (95 th percentile)	9.5	4.5	6.4	28.7	7.7	12.0	5.3	35.3	2.3	8.0	30.4	31.2
Queue Storage Ratio (*RQ*) (95 th percentile)	1.61	0.11	0.00	2.39	0.64	1.33	0.67	1.00	0.29	1.01	0.85	0.87
Uniform Delay (*d 1*), s/veh	82.9	71.3	72.6	92.1	72.3	68.5	54.3	24.7	2.0	35.3	13.6	13.5
Incremental Delay (*d 2*), s/veh	1.4	0.2	0.4	44.0	0.4	0.8	11.3	1.7	0.1	1.5	2.0	2.8
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	0.0	0.0
Control Delay (*d*), s/veh	84.3	71.5	73.0	136.1	72.7	69.3	65.6	26.4	2.1	36.8	15.6	16.3
Level of Service (LOS)	F	E	E	F	E	E	E	C	A	D	B	B
Approach Delay, s/veh / LOS	77.8	E		106.3	F		27.1	C		17.4	B	
Intersection Delay, s/veh / LOS	32.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	2.09	B
Bicycle LOS Score / LOS	0.87	A	1.37	A	1.93	B	2.78	C

 HCS™ Streets Version 7.9 Generated: 2/17/2021 2:55:55 PM

HCS7 Signalized Intersection Results Summary

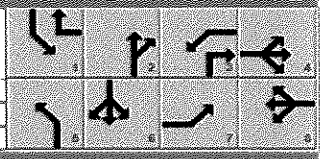
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.95
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 7:15
Intersection	Bartley/Southpointe	File Name	Bardstown AM 23 NB.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	22	4	9	33	2	139	11	2485	140	117	1147	10

Signal Information			
Cycle, s	180.0	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	2.6	2.9	128.8	5.0	11.9	0.0	
Yellow	4.0	0.0	5.1	4.0	3.6	0.0	
Red	3.0	0.0	3.0	3.0	3.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		10.0		9.0	2.0	3.0	1.1	4.0
Phase Duration, s		12.0		18.5	9.6	136.9	12.5	139.8
Change Period, (*Y+Rc*), s		7.0		6.6	7.0	8.1	6.5	8.1
Max Allow Headway (*MAH*), s		3.2		5.3	3.1	0.0	5.1	0.0
Queue Clearance Time (*gs*), s		4.3		10.9	3.1		3.6	
Green Extension Time (*ge*), s		0.0		1.0	0.0	0.0	0.6	0.0
Phase Call Probability		0.84		1.00	0.43		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

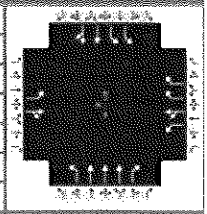
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	23	14		35	2	146	11	2536	143	114	566	565
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1663		1781	1870	1403	1781	1698	1585	1702	1870	1865
Queue Service Time (*gs*), s	2.3	1.5		3.3	0.2	8.9	1.1	44.9	2.3	1.6	31.9	31.7
Cycle Queue Clearance Time (*gc*), s	2.3	1.5		3.3	0.2	8.9	1.1	44.9	2.3	1.6	31.9	31.7
Green Ratio (*g/C*)	0.03	0.03		0.07	0.07	0.10	0.01	0.72	0.78	0.75	0.73	0.73
Capacity (*c*), veh/h	50	47		118	124	279	26	3647	1240	309	1369	1365
Volume-to-Capacity Ratio (*X*)	0.463	0.293		0.294	0.017	0.524	0.440	0.695	0.115	0.370	0.414	0.414
Back of Queue (*Q*), ft/ln (95 th percentile)	50.4	29.5		73.5	4.3	151.7	24.6	482.7	30.3	45.8	544.7	539.6
Back of Queue (*Q*), veh/ln (95 th percentile)	2.0	1.2		2.9	0.2	6.0	1.0	19.0	1.2	1.8	21.4	21.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.17	0.10		0.49	0.02	0.38	0.16	0.44	0.15	0.11	0.61	0.60
Uniform Delay (*d1*), s/veh	86.1	85.7		80.0	78.5	77.0	88.9	11.2	2.6	15.6	18.2	17.9
Incremental Delay (*d2*), s/veh	2.5	1.3		1.9	0.1	2.2	1.5	0.4	0.1	1.0	0.9	0.9
Initial Queue Delay (*d3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	88.6	87.0		82.0	78.6	79.1	90.4	11.6	2.7	16.6	19.0	18.8
Level of Service (LOS)	F	F		F	E	E	F	B	A	B	B	B
Approach Delay, s/veh / LOS	88.0	F		79.7	E		11.5	B		18.7	B	
Intersection Delay, s/veh / LOS	17.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.63	C	2.63	C	2.39	B	1.87	B
Bicycle LOS Score / LOS	0.55	A	0.79	A	2.01	B	1.59	B

 HCS™ Streets Version 7.9 Generated: 2/17/2021 12:19:49 PM

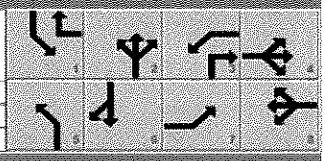
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 16, 2021	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.95
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 7:15
Intersection	Bartley/Southpointe	File Name	Bardstown AM 23 B R.xus		
Project Description	Cedar Creek Apt Right				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	22	4	9	33	2	139	11	2528	140	117	1164	10

Signal Information			
Cycle, s	180.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	Off
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.6	1.8	126.6	5.0	11.8	0.0	
Yellow	4.0	3.5	5.1	4.0	3.6	0.0	
Red	0.0	3.0	3.0	3.0	3.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		10.0		9.0	1.1	3.0	2.0	4.0
Phase Duration, s		12.0		18.4	6.6	134.7	14.9	143.0
Change Period, (*Y+R c*), s		7.0		6.6	4.0	8.1	6.5	8.1
Max Allow Headway (*MAH*), s		3.2		5.3	3.0	0.0	5.0	0.0
Queue Clearance Time (*g s*), s		4.3		10.8	2.3		7.9	
Green Extension Time (*g e*), s		0.0		1.0	0.0	0.0	0.6	0.0
Phase Call Probability		0.84		1.00	0.43		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

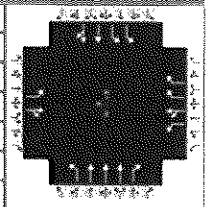
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	23	14		35	2	146	11	2580	143	113	567	565
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1689		1781	1900	1403	1781	1698	1585	1702	1870	1865
Queue Service Time (*g s*), s	2.3	1.4		3.3	0.2	8.8	0.3	47.9	2.2	5.9	31.9	31.7
Cycle Queue Clearance Time (*g c*), s	2.3	1.4		3.3	0.2	8.8	0.3	47.9	2.2	5.9	31.9	31.7
Green Ratio (*g/C*)	0.03	0.03		0.07	0.07	0.11	0.72	0.70	0.77	0.72	0.75	0.75
Capacity (*c*), veh/h	51	47		117	125	315	344	3582	1218	159	1401	1397
Volume-to-Capacity Ratio (*X*)	0.456	0.289		0.297	0.017	0.465	0.033	0.720	0.117	0.712	0.405	0.405
Back of Queue (*Q*), ft/ln (95 th percentile)	49.5	29		73.6	4.3	148.6	5.4	467.7	27	124.5	536	530.2
Back of Queue (*Q*), veh/ln (95 th percentile)	2.0	1.2		2.9	0.2	5.9	0.2	18.4	1.1	4.8	21.1	20.9
Queue Storage Ratio (*RQ*) (95 th percentile)	0.17	0.10		0.49	0.02	0.37	0.04	0.43	0.13	0.31	0.60	0.59
Uniform Delay (*d 1*), s/veh	86.1	85.7		80.1	78.7	74.8	9.2	12.0	2.6	83.0	17.6	17.4
Incremental Delay (*d 2*), s/veh	2.4	1.2		2.0	0.1	1.5	0.0	0.4	0.1	7.7	0.8	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	0.0
Control Delay (*d*), s/veh	88.5	86.9		82.1	78.7	76.4	9.2	12.4	2.7	90.7	18.4	18.2
Level of Service (LOS)	F	F		F	E	E	A	B	A	F	B	B
Approach Delay, s/veh / LOS	87.9	F		77.5	E		11.9	B		24.9	C	
Intersection Delay, s/veh / LOS	19.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.63	C	2.63	C	2.39	B	1.87	B
Bicycle LOS Score / LOS	0.55	A	0.79	A	2.04	B	1.61	B

 HCS™ Streets Version 7.9 Generated: 2/16/2021 2:31:21 PM

HCS7 Signalized Intersection Results Summary

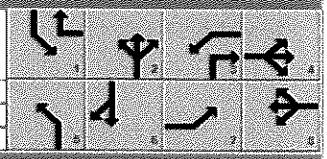
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.96
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 4:45
Intersection	Bartley/Wingfield	File Name	Bardstown PM 23 NB.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	8	14	379	8	298	23	1550	211	521	2223	0

Signal Information			
Cycle, s	225.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	Off
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.6	26.8	126.2	7.1	28.5	0.0	
Yellow	3.5	3.5	4.7	3.6	3.6	0.0	
Red	2.7	2.7	1.5	3.0	3.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		10.0		9.0	1.1	3.0	2.0	4.0
Phase Duration, s		13.7		35.1	10.8	132.4	43.8	165.4
Change Period, ($Y+R_c$), s		6.6		6.6	6.2	6.2	6.2	6.2
Max Allow Headway (*MAH*), s		3.2		3.2	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s		7.2		26.9	3.3		36.4	
Green Extension Time (g_e), s		0.0		1.6	0.0	0.0	1.3	0.0
Phase Call Probability		0.98		1.00	0.77		1.00	
Max Out Probability		0.01		0.00	0.00		0.00	

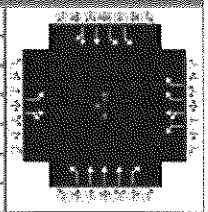
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	42	23		201	202	310	24	1604	218	537	2291	0
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1678		1781	1785	1403	1781	1698	1585	1730	1885	0
Queue Service Time (g_s), s	5.2	3.0		24.9	24.9	19.8	1.3	29.5	4.1	34.4	106.3	0.0
Cycle Queue Clearance Time (g_c), s	5.2	3.0		24.9	24.9	19.8	1.3	29.5	4.1	34.4	106.3	0.0
Green Ratio (*g/C*)	0.03	0.03		0.13	0.13	0.30	0.58	0.56	0.69	0.92	0.71	
Capacity (*c*), veh/h	64	53		234	234	825	105	2857	1090	594	2684	
Volume-to-Capacity Ratio (*X*)	0.650	0.433		0.862	0.862	0.376	0.226	0.561	0.200	0.904	0.854	0.000
Back of Queue (*Q*), ft/ln (95 th percentile)	114.8	62.4		444.9	445.9	293.6	26.3	368.2	59.2	457.5	1314.1	0
Back of Queue (*Q*), veh/ln (95 th percentile)	4.5	2.5		17.5	17.6	11.6	1.0	14.5	2.3	18.0	52.1	0.0
Queue Storage Ratio (*RQ*) (95 th percentile)	0.38	0.21		1.48	1.49	0.73	0.18	0.41	0.30	1.14	1.10	0.00
Uniform Delay (d_1), s/veh	107.0	107.0		95.8	95.8	63.1	35.5	15.3	3.9	94.4	29.2	
Incremental Delay (d_2), s/veh	4.1	2.1		3.8	3.8	0.1	0.3	0.6	0.3	1.0	0.5	0.0
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	0.0
Control Delay (*d*), s/veh	111.1	109.0		99.5	99.5	63.2	35.8	15.8	4.2	95.4	29.7	
Level of Service (LOS)	F	F		F	F	E	D	B	A	F	C	
Approach Delay, s/veh / LOS	110.4	F		83.7	F		14.7	B		42.2	D	
Intersection Delay, s/veh / LOS	39.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.63	C	2.64	C	2.43	B	1.89	B
Bicycle LOS Score / LOS	0.59	A	1.66	B	1.51	B	2.85	C

 HCS™ Streets Version 7.9 Generated: 2/17/2021 2:10:34 PM

HCS7 Signalized Intersection Results Summary

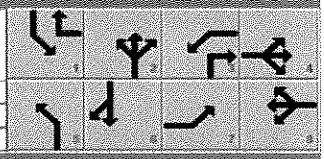
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Feb 17, 2021	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.96
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 4:45
Intersection	Bartley/Wingfield	File Name	Bardstown PM 23 B R.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	8	14	379	8	298	23	1602	206	503	2326	12

Signal Information			
Cycle, s	225.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	Off
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	4.6	24.3		126.6	9.4	28.2	0.0					
Yellow	3.5	3.5		4.7	3.6	3.6	0.0					
Red	2.7	2.7		1.5	3.0	3.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		10.0		9.0	1.1	3.0	2.0	4.0
Phase Duration, s		16.0		34.8	10.8	132.8	41.3	163.3
Change Period, (*Y+R c*), s		6.6		6.6	6.2	6.2	6.2	6.2
Max Allow Headway (*MAH*), s		3.2		3.2	3.0	0.0	3.0	0.0
Queue Clearance Time (*g s*), s		11.4		26.7	3.3		34.1	
Green Extension Time (*g e*), s		0.0		1.5	0.0	0.0	1.0	0.0
Phase Call Probability		0.98		1.00	0.77		1.00	
Max Out Probability		1.00		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	23		201	202	310	23	1635	210	501	1164	1164
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1795	1691		1795	1799	1414	1781	1698	1585	1730	1885	1882
Queue Service Time (*g s*), s	5.1	3.0		24.7	24.7	19.9	1.3	32.2	4.3	32.1	115.3	115.6
Cycle Queue Clearance Time (*g c*), s	5.1	3.0		24.7	24.7	19.9	1.3	32.2	4.3	32.1	115.3	115.6
Green Ratio (*g/C*)	0.04	0.04		0.13	0.13	0.29	0.58	0.56	0.69	0.91	0.70	0.70
Capacity (*c*), veh/h	75	71		233	234	796	96	2868	1091	555	1325	1323
Volume-to-Capacity Ratio (*X*)	0.555	0.324		0.863	0.863	0.390	0.245	0.570	0.193	0.902	0.878	0.880
Back of Queue (*Q*), ft/ln (95 th percentile)	114.9	60.7		451.6	452.4	295.5	26.8	385.2	60.1	427.2	1413.8	1424.3
Back of Queue (*Q*), veh/ln (95 th percentile)	4.6	2.4		17.9	18.0	11.7	1.1	15.2	2.4	16.8	56.1	56.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.38	0.20		1.51	1.51	0.74	0.18	0.48	0.30	1.07	1.18	1.18
Uniform Delay (*d 1*), s/veh	105.8	104.7		95.9	95.9	65.2	40.5	16.8	4.3	96.4	34.3	33.8
Incremental Delay (*d 2*), s/veh	5.3	1.0		8.7	8.7	0.1	0.3	0.6	0.3	1.2	1.1	1.1
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	0.0
Control Delay (*d*), s/veh	111.1	105.7		104.7	104.7	65.3	40.8	17.4	4.6	97.6	35.4	35.0
Level of Service (LOS)	F	F		F	F	E	D	B	A	F	D	C
Approach Delay, s/veh / LOS	109.2	F		87.6	F		16.3	B		46.2	D	
Intersection Delay, s/veh / LOS	42.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.63	C	2.64	C	2.43	B	1.89	B
Bicycle LOS Score / LOS	0.59	A	1.66	B	1.54	B	2.93	C

 HCS™ Streets Version 7.9 Generated: 2/17/2021 2:55:55 PM

final report

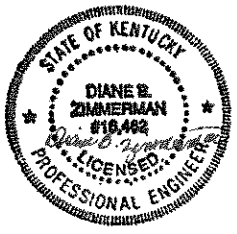
July 8, 2020

Traffic Impact Study

Apartments
8000 Cedar Creek Road
Louisville, KY

Prepared for

Louisville Metro Planning Commission



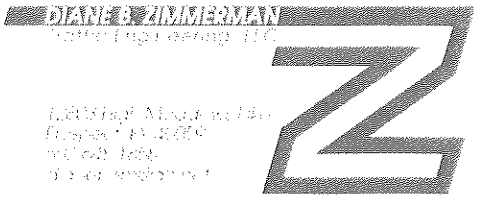


Table of Contents

INTRODUCTION

The development plan for an apartment community on Cedar Creek Road in Louisville, KY shows 343 apartment units. **Figure 1** displays a map of the site. Access to the community will be from an entrance on the Cedar Creek Road and a proposed access road to the north. 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 Cedar Creek Road with Bardstown Road and the proposed entrance on Cedar Creek Road.

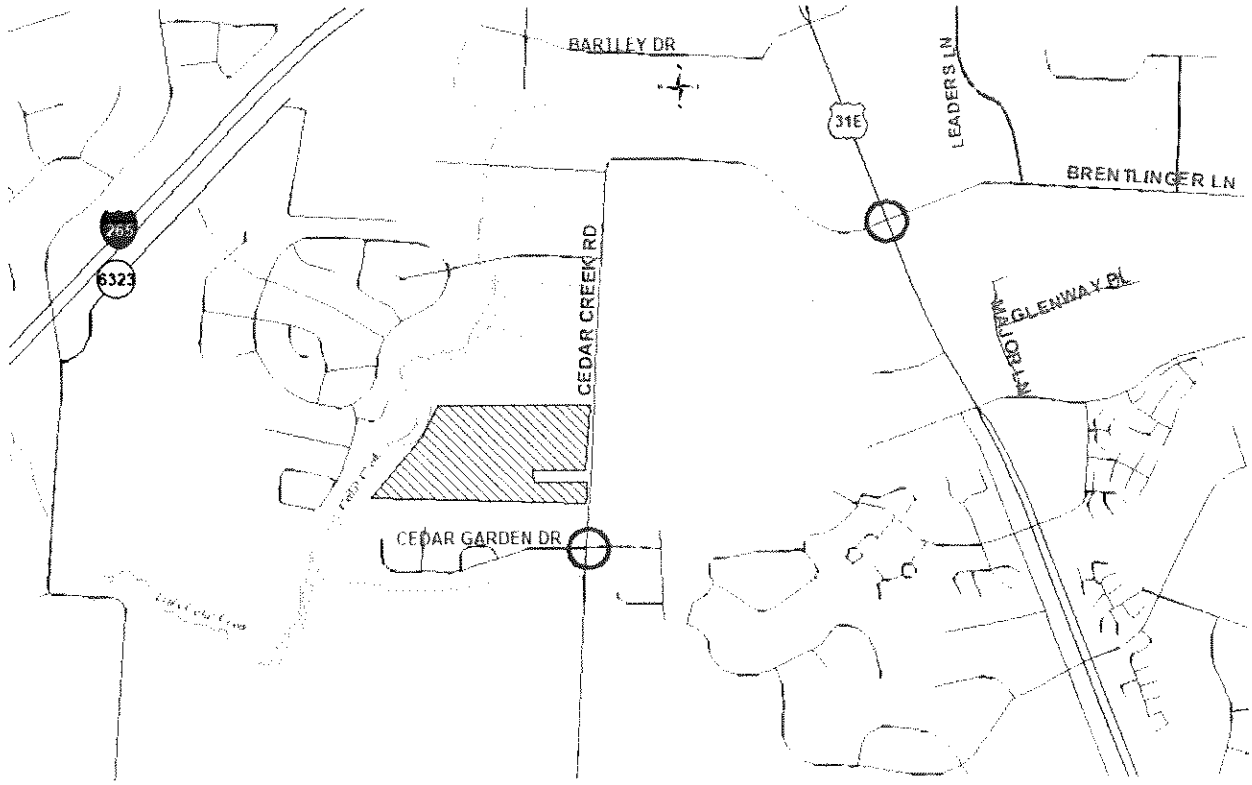


Figure 1. Site Map

EXISTING CONDITIONS

Cedar Creek Road, is a Metro-maintained road with an estimated 2020 ADT of 2,900 vehicles per day between the Bardstown Road and Gentry Lane, as estimated from the Kentucky Transportation 2019 count at station 316. The road has two ten-foot lanes with three-foot shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Bardstown Road is controlled with a traffic signal. There is a dedicated left turn lane on each approach at the intersection, and northbound Bardstown Road and westbound Brentlinger Lane have dedicated right turn lanes.

Peak hour traffic counts for the intersections were obtained on Tuesday, March 3, 2020. The a.m. peak hour on Cedar Creek Road was 7:00 to 8:00 and the p.m. peak hour was 4:45 to 5:45. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data for each intersection.

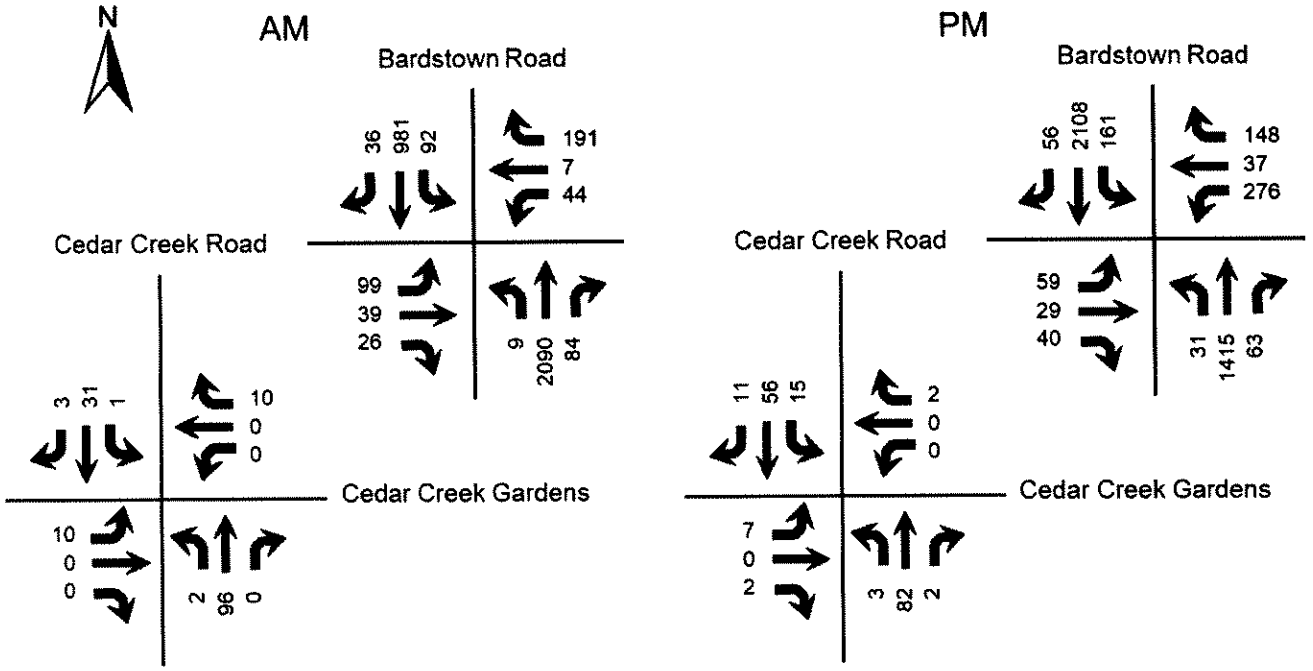


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2023. An annual growth rate of 1.0 percent was applied to all 2020 volumes. This is determined by reviewing 2018 and 2015 counts at the intersection of Cedar Creek Road and Bardstown Road. Additionally trip generation for 16 additional single family homes on Cedar Creek Gardens and 88 single family homes on Heights Drive were included. **Figure 3** displays the 2023 No Build peak hour volumes.

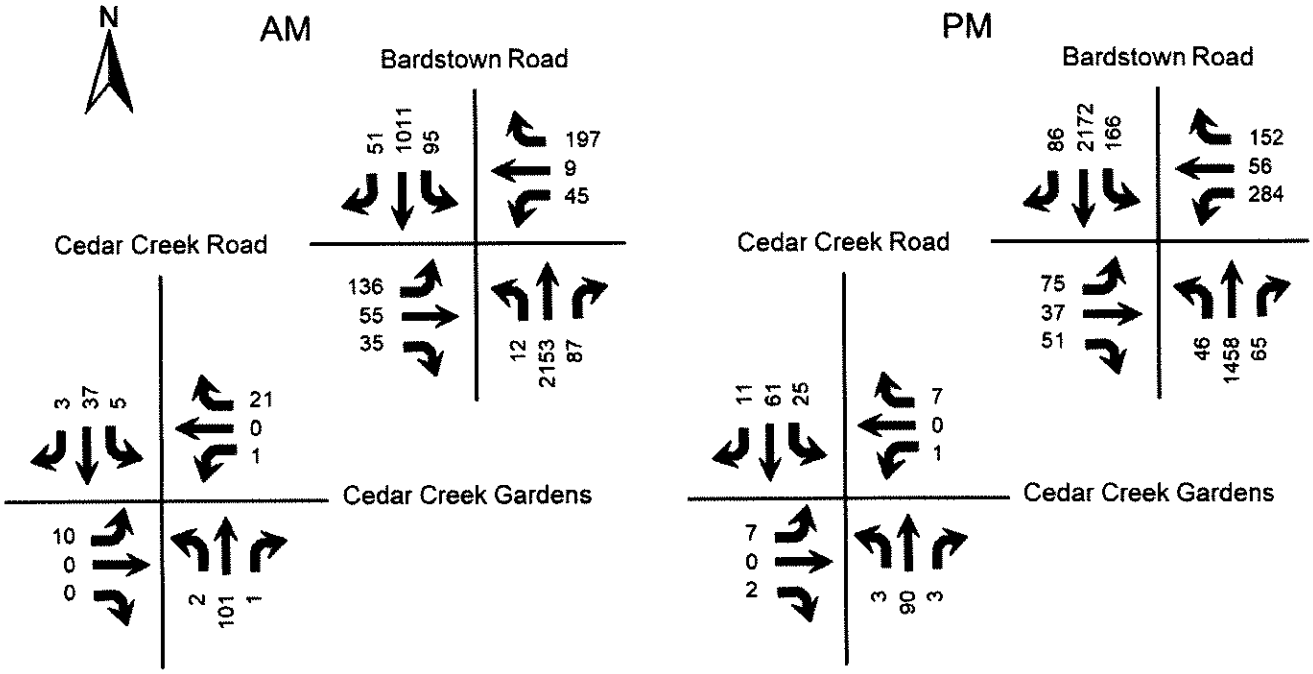


Figure 3. 2023 No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of developments. The land use of "Multifamily Housing Mid-Rise (221)" was 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**. **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
Multifamily Housing Mid-Rise (343 units)	115	30	85	145	88	57

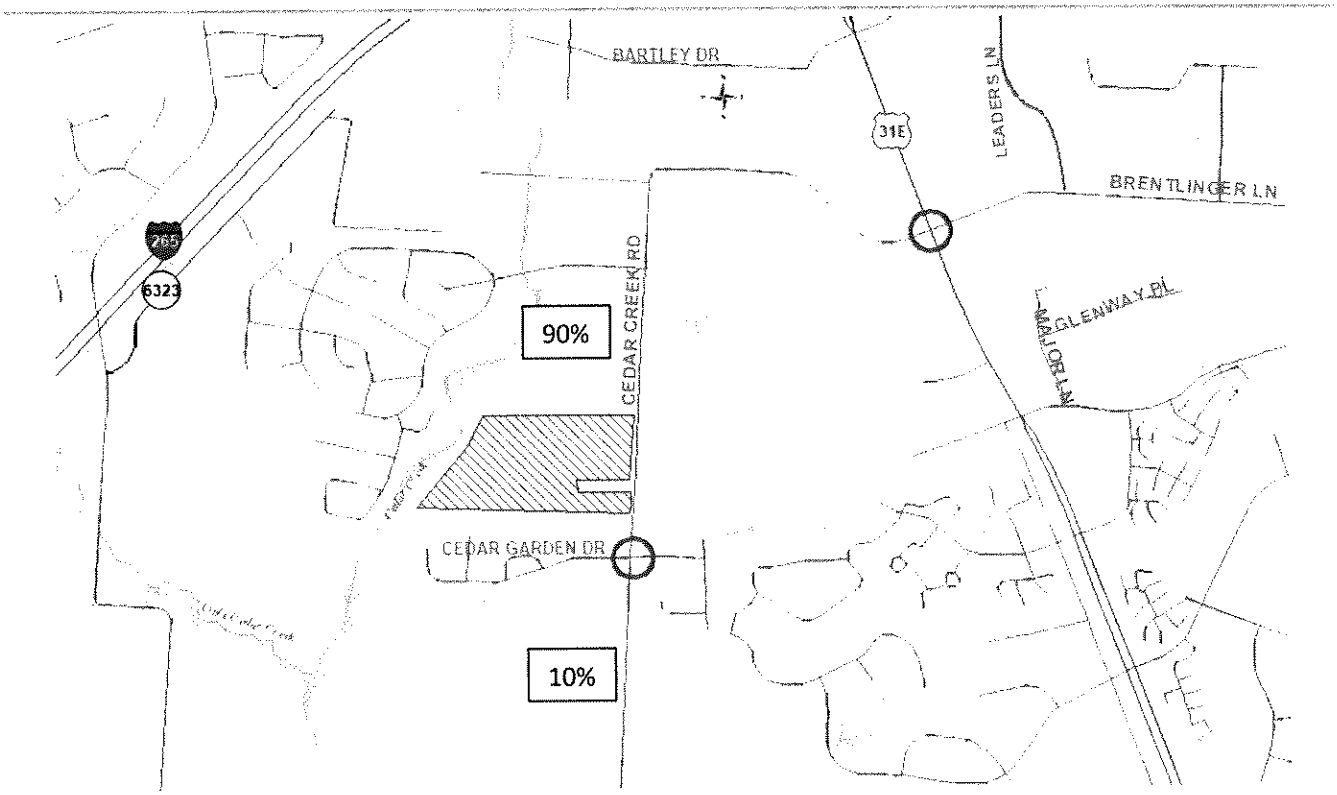


Figure 4. Trip Distribution Percentages

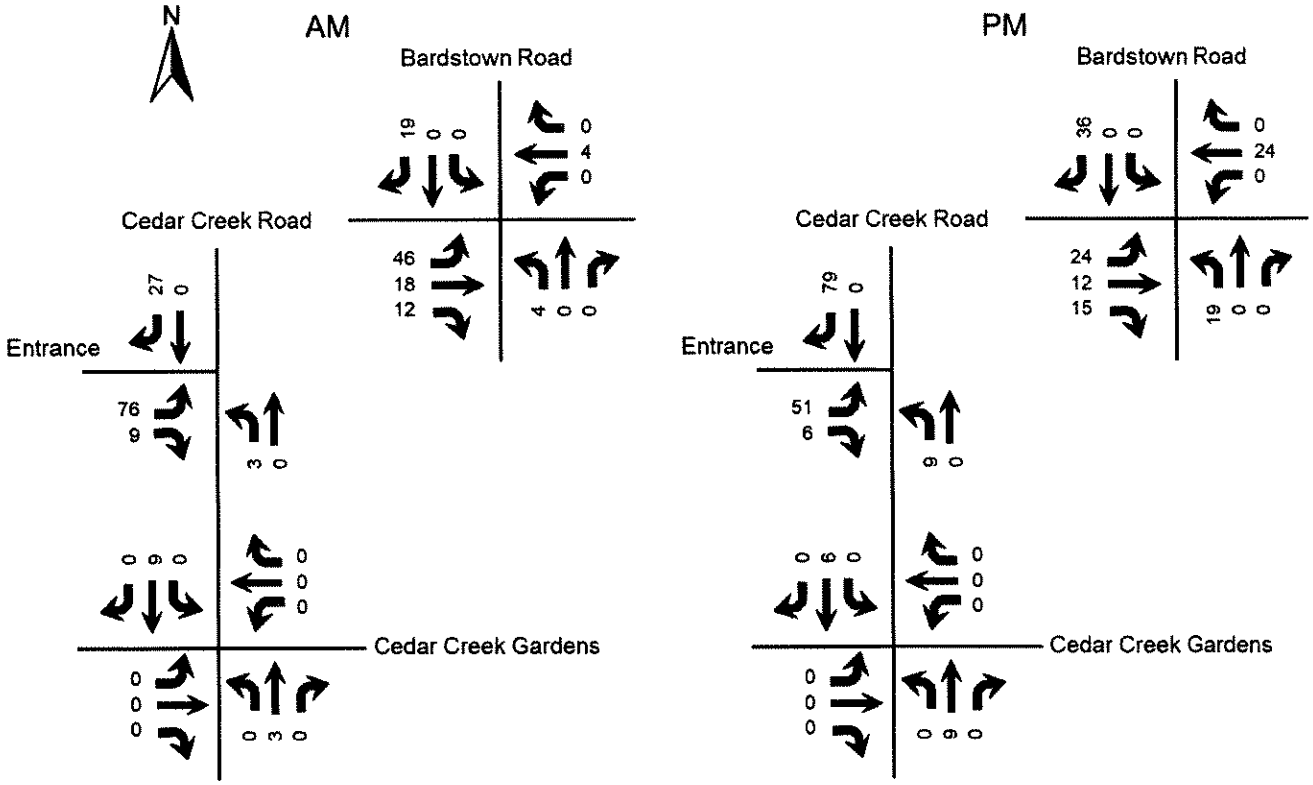


Figure 5. Peak Hour Trips Generated by Site

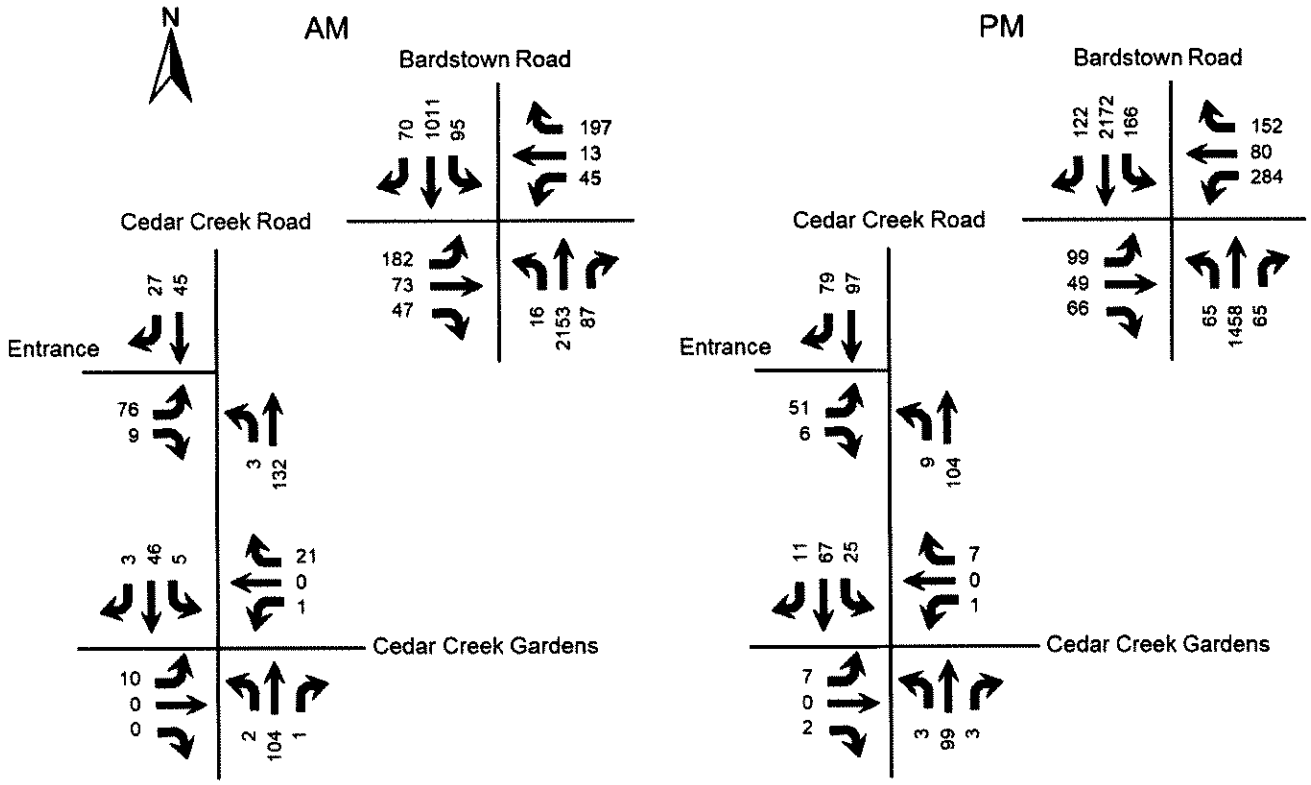


Figure 6. Build Peak Hour Volumes

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 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, 6th edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.8) software. The delays and Level of Service are summarized in **Table 2.**

Table 2. Peak Hour Level of Service

Approach	A.M.			P.M.		
	2020 Existing	2023 No Build	2023 Build	2020 Existing	2023 No Build	2023 Build
Cedar Creek Road at Cedar Creek Gardens						
Cedar Creek Gardens Eastbound	A 9.5	A 9.8	A 9.9	A 9.6	A 9.8	A 9.9
Cedar Creek Gardens Westbound	A 8.8	A 8.9	A 9.0	A 8.7	A 8.9	A 9.0
Cedar Creek Road Northbound (left)	A 7.3	A 7.3	A 7.3	A 7.3	A 7.4	A 7.4
Cedar Creek Road Southbound (left)	A 7.4	A 7.4	A 7.4	A 7.4	A 7.4	A 7.5
Cedar Creek Road at Entrance						
Entrance Eastbound			B 10.2			B 10.4
Cedar Creek Road Northbound (left)			A 7.4			A 7.6
Bardstown Road at Cedar Creek Road	**C 22.7**	**C 25.4**	**C 27.9**	**D 46.8**	**D 50.6**	**E 55.3**
Cedar Creek Road Eastbound	E 73.6	E 76.5	F 80.4	E 74.2	E 76.1	E 78.9
Brentlinger Lane Westbound	E 79.4	E 79.7	E 75.8	F 115.6	F 132.2	F 153.9
Bardstown Road Northbound	B 19.9	B 21.9	C 23.5	C 24.4	C 25.4	C 26.9
Bardstown Road Southbound	A 8.7	A 10.0	B 11.9	D 46.3	D 48.7	D 51.2

Key: Level of Service, Delay in seconds per vehicle

The level of service F condition in the am peak on Cedar Creek Road at Bardstown Road can be mitigated by adding one (1) second of green time to the Cedar Creek Road approach. The entrance was evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated March, 2017. Using the volumes in Figure 6, no turn lanes are required at the entrance.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2023, there will be a minimal impact to the existing highway network, with the signalized intersections continuing to operate at acceptable levels of service. No improvements are required.

APPENDIX

Traffic Counts

Jefferson County (Louisville), KY
Classified Turn Movement Count

Site 3 of 3
US-150 Bardstown Rd (North)
Brentlinger Ln
US-150 Bardstown Rd (South)
Cedar Creek Rd

Lat/Long
38.134142°, -85.579609°

Weather
Fair
52° F

Date
Tuesday, March 3, 2020

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1225 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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	Southbound US-150 Bardstown Rd (North)						Westbound Brentlinger Ln						Northbound US-150 Bardstown Rd (South)						Eastbound Cedar Creek Rd						
	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	U-Turn	Left	Thru	Right	Peds	App.	Int.
0700 - 0715	0	25	184	7	0	216	0	4	1	60	0	65	0	1	522	14	0	537	0	45	10	3	0	58	876
0715 - 0730	0	14	222	7	0	243	0	6	1	50	0	57	0	1	556	14	0	571	0	34	10	13	0	57	928
0730 - 0745	0	18	239	13	0	270	0	13	3	46	0	62	0	1	521	22	0	544	0	25	12	4	0	41	917
0745 - 0800	0	36	266	11	0	313	0	11	1	51	0	63	0	2	503	27	1	533	0	23	11	4	0	38	947
0800 - 0815	0	24	254	5	0	283	0	14	2	44	0	60	0	5	510	21	0	536	0	17	6	5	0	28	907
0815 - 0830	0	38	216	9	0	263	0	9	4	35	0	48	0	1	482	21	0	504	0	18	13	4	0	35	850
0830 - 0845	0	29	190	9	0	228	0	13	5	70	0	88	0	4	447	22	0	473	0	26	10	7	0	43	832
0845 - 0900	0	69	187	9	0	265	0	17	10	77	0	104	0	2	376	18	0	396	0	15	12	3	0	30	795
1600 - 1615	0	50	468	17	0	535	0	55	16	69	0	140	0	3	298	7	0	308	0	12	3	6	0	21	1004
1615 - 1630	0	41	509	11	0	561	0	70	9	37	0	116	0	7	350	12	0	369	0	19	8	8	0	35	1081
1630 - 1645	0	38	523	14	0	575	0	57	16	41	0	114	0	5	353	13	0	371	0	20	7	10	0	37	1097
1645 - 1700	0	35	489	14	0	538	0	69	5	35	0	109	1	8	349	16	0	374	0	12	6	12	0	30	1051
1700 - 1715	0	34	536	14	0	584	0	66	9	39	0	114	0	9	362	13	0	384	0	17	9	9	0	35	1117
1715 - 1730	0	48	534	14	0	596	0	69	13	38	0	120	0	6	359	19	0	384	0	8	6	11	0	25	1125
1730 - 1745	0	44	549	14	0	607	0	72	10	36	0	118	0	7	345	15	0	367	0	22	8	8	0	38	1130
1745 - 1800	0	49	441	20	0	510	0	60	19	26	0	105	0	6	318	19	0	343	0	15	4	6	0	25	983

0715 - 0730	0	14	222	7	0	243	0	6	1	50	0	57	0	1	556	14	0	571	0	34	10	13	0	57	928
0730 - 0745	0	18	239	13	0	270	0	13	3	46	0	62	0	1	521	22	0	544	0	25	12	4	0	41	917
0745 - 0800	0	36	266	11	0	313	0	11	1	51	0	63	0	2	503	27	1	533	0	23	11	4	0	38	947
0800 - 0815	0	24	254	5	0	283	0	14	2	44	0	60	0	5	510	21	0	536	0	17	6	5	0	28	907
AM PEAK	**0**	**92**	**981**	**36**	**0**	**1109**	**0**	**44**	**7**	**191**	**0**	**242**	**0**	**9**	**2090**	**84**	**1**	**2184**	**0**	**99**	**39**	**26**	**0**	**164**	**3689**
1645 - 1700	0	35	489	14	0	538	0	69	5	35	0	109	1	8	349	16	0	374	0	12	6	12	0	30	1051
1700 - 1715	0	34	536	14	0	584	0	66	9	39	0	114	0	9	362	13	0	384	0	17	9	9	0	35	1117
1715 - 1730	0	48	534	14	0	596	0	69	13	38	0	120	0	6	359	19	0	384	0	8	6	11	0	25	1125
1730 - 1745	0	44	549	14	0	607	0	72	10	36	0	118	0	7	345	15	0	367	0	22	8	8	0	38	1130
PM PEAK	**0**	**161**	**2108**	**56**	**0**	**2325**	**0**	**276**	**37**	**148**	**0**	**461**	**1**	**30**	**1415**	**63**	**0**	**1509**	**0**	**59**	**29**	**46**	**0**	**128**	**4423**

Jefferson County (Louisville), KY
Classified Turn Movement Count

Site 2 of 3
Cedar Creek Rd (North)
Cedar Garden Dr (East)
Cedar Creek Rd (South)
Cedar garden Dr (West)

Lat/Long
38.127684°, -85.587208°

Weather
Fair
55°F

Date
Tuesday, March 3, 2020

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
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1229 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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1 (800) 615-3765

	Southbound Cedar Creek Rd (North)						Westbound Cedar Garden Dr (East)						Northbound Cedar Creek Rd (South)						Eastbound Cedar garden Dr (West)						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	Int.
0700 - 0715	0	0	5	0	0	5	0	0	0	4	0	4	0	0	31	0	0	31	0	3	0	0	0	3	43
0715 - 0730	1	0	4	2	0	7	0	0	0	0	0	0	0	1	30	0	0	31	0	3	0	0	0	3	41
0730 - 0745	0	0	15	0	0	15	0	0	0	4	0	4	0	0	19	0	0	19	0	2	0	0	0	2	40
0745 - 0800	0	1	7	1	0	9	0	0	0	2	0	2	0	1	16	0	0	17	0	2	0	0	0	2	30
0800 - 0815	0	2	7	0	0	9	0	0	0	0	0	0	0	0	18	0	0	18	0	1	0	2	0	3	30
0815 - 0830	0	1	8	0	0	9	0	1	0	2	0	3	0	0	15	0	0	15	0	1	0	0	0	1	28
0830 - 0845	0	1	9	1	0	11	0	0	0	1	0	1	0	0	17	1	0	18	0	3	0	1	0	4	34
0845 - 0900	0	3	10	0	0	13	0	0	0	0	0	0	0	0	18	0	0	18	0	1	0	0	0	1	32
1600 - 1615	0	1	21	2	0	24	0	0	0	1	0	1	0	1	10	0	0	11	0	2	0	0	0	2	38
1615 - 1630	0	1	17	2	1	21	0	1	0	1	0	2	0	2	20	2	0	24	0	2	0	2	0	4	51
1630 - 1645	0	0	11	5	0	16	0	0	0	1	0	1	0	2	21	0	0	23	0	0	0	0	0	0	40
1645 - 1700	0	3	19	4	0	26	0	0	0	0	0	0	0	1	19	1	0	21	0	2	0	0	0	2	49
1700 - 1715	0	1	10	1	0	12	0	0	0	2	0	2	0	1	22	0	0	23	0	2	0	0	0	2	39
1715 - 1730	0	8	12	3	0	23	0	0	0	0	0	0	0	0	16	1	0	17	0	2	0	1	0	3	43
1730 - 1745	0	3	15	3	0	21	0	0	0	0	0	0	0	1	25	0	0	26	0	1	0	1	0	2	49
1745 - 1800	0	5	20	3	0	28	0	0	0	1	0	1	0	2	14	1	0	17	0	2	0	0	0	2	48

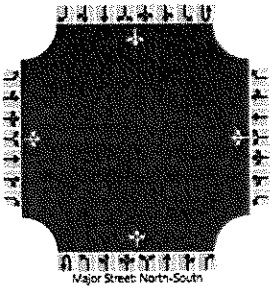
0700 - 0715	0	0	5	0	0	5	0	0	0	4	0	4	0	0	31	0	0	31	0	3	0	0	0	3	43
0715 - 0730	1	0	4	2	0	7	0	0	0	0	0	0	0	1	30	0	0	31	0	3	0	0	0	3	41
0730 - 0745	0	0	15	0	0	15	0	0	0	4	0	4	0	0	19	0	0	19	0	2	0	0	0	2	40
0745 - 0800	0	1	7	1	0	9	0	0	0	2	0	2	0	1	16	0	0	17	0	2	0	0	0	2	30
AM PEAK	1	1	31	3	0	36	0	0	0	10	0	10	0	2	96	0	0	98	0	10	0	0	0	10	154
1645 - 1700	0	3	19	4	0	26	0	0	0	0	0	0	0	1	19	1	0	21	0	2	0	0	0	2	49
1700 - 1715	0	1	10	1	0	12	0	0	0	2	0	2	0	1	22	0	0	23	0	2	0	0	0	2	39
1715 - 1730	0	8	12	3	0	23	0	0	0	0	0	0	0	0	16	1	0	17	0	2	0	1	0	3	43
1730 - 1745	0	3	15	3	0	21	0	0	0	0	0	0	0	1	25	0	0	26	0	1	0	1	0	2	49
PM PEAK	0	15	56	11	0	82	0	0	0	2	0	2	0	3	82	2	0	87	0	7	0	2	0	9	180

HCS Reports

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2020	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		0	0	10		2	96	0		1	31	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11				11			2				1		
Capacity, c (veh/h)			805				953			1586				1497		
v/c Ratio			0.01				0.01			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.0		
Control Delay (s/veh)			9.5				8.8			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.5				8.8				0.2				0.2		
Approach LOS		A				A										

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HCS7 Two-Way Stop-Control Report

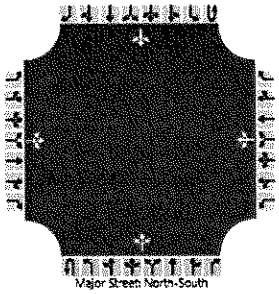
General Information

Analyst	DBZ
Agency/Co.	Diane B Zimmerman Traffic Engineering
Date Performed	7/8/2020
Analysis Year	2023
Time Analyzed	AM Peak No Build
Intersection Orientation	North-South
Project Description	Hagan Apartments

Site Information

Intersection	Cedar Creek Rd at CC Gard
Jurisdiction	
East/West Street	Cedar Creek Garden
North/South Street	Cedar Creek Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		1	0	21		2	101	1		5	37	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11				24			2				6		
Capacity, c (veh/h)			760				937			1577				1489		
v/c Ratio			0.01				0.03			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.1			0.0				0.0		
Control Delay (s/veh)			9.8				8.9			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.8				8.9				0.2				0.9		
Approach LOS		A				A										

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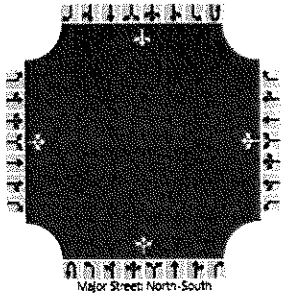
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak Build	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	0	0		1	0	21		2	104	1		5	46	3
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11				24			2				6		
Capacity, c (veh/h)			745				933			1564				1484		
v/c Ratio			0.01				0.03			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.0				0.1			0.0				0.0		
Control Delay (s/veh)			9.9				9.0			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.9				9.0				0.1				0.7		
Approach LOS		A				A										

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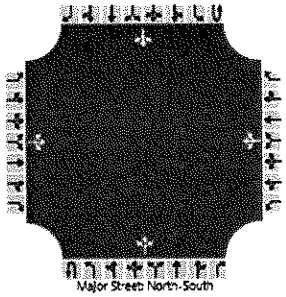
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2020	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		0	0	2		3	82	2		15	56	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				2			3				16		
Capacity, c (veh/h)			800				973			1540				1516		
v/c Ratio			0.01				0.00			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.0		
Control Delay (s/veh)			9.6				8.7			7.3				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)	9.6				8.7				0.3				1.4			
Approach LOS	A				A											

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HCS7 Two-Way Stop-Control Report

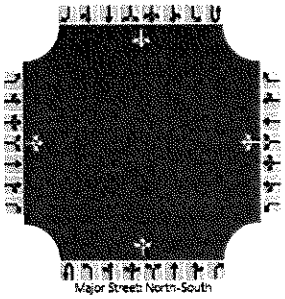
General Information

Analyst	DBZ
Agency/Co.	Diane B Zimmerman Traffic Engineering
Date Performed	7/8/2020
Analysis Year	2023
Time Analyzed	PM Peak No Build
Intersection Orientation	North-South
Project Description	Hagan Apartments

Site Information

Intersection	Cedar Creek Rd at CC Gard
Jurisdiction	
East/West Street	Cedar Creek Garden
North/South Street	Cedar Creek Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		1	0	7		3	90	3		25	61	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				9			3				27		
Capacity, c (veh/h)			754				921			1533				1504		
v/c Ratio			0.01				0.01			0.00				0.02		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.1		
Control Delay (s/veh)			9.8				8.9			7.4				7.4		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.8				8.9				0.2				2.0		
Approach LOS		A				A										

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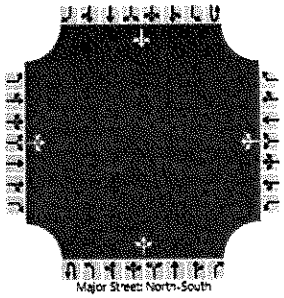
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek Rd at CC Gard
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/8/2020	East/West Street	Cedar Creek Garden
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	PM Peak Build	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apartments		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	0	2		1	0	7		3	99	3		25	67	11
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10				9			3				27		
Capacity, c (veh/h)			737				908			1525				1492		
v/c Ratio			0.01				0.01			0.00				0.02		
95% Queue Length, Q_{95} (veh)			0.0				0.0			0.0				0.1		
Control Delay (s/veh)			9.9				9.0			7.4				7.5		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)		9.9				9.0				0.2				1.9		
Approach LOS		A				A										

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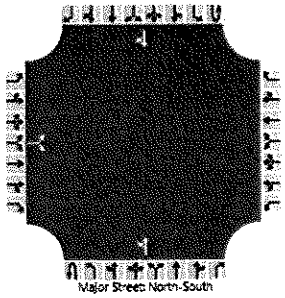
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Cedar Creek at Entrance
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/9/2020	East/West Street	Entrance
Analysis Year	2023	North/South Street	Cedar Creek Road
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Hagan Apt		

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		76		9						3	132				45	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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			94							3						
Capacity, c (veh/h)			792							1531						
v/c Ratio			0.12							0.00						
95% Queue Length, Q_{95} (veh)			0.4							0.0						
Control Delay (s/veh)			10.2							7.4						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.2								0.2							
Approach LOS	B															

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HCS7 Two-Way Stop-Control Report

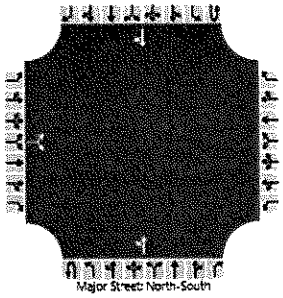
General Information

Analyst	DBZ
Agency/Co.	Diane B Zimmerman Traffic Engineering
Date Performed	7/9/2020
Analysis Year	2023
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Hagan Apt

Site Information

Intersection	Cedar Creek at Entrance
Jurisdiction	
East/West Street	Entrance
North/South Street	Cedar Creek Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		51		6						9	104				97	79
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)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			62							10						
Capacity, c (veh/h)			724							1394						
v/c Ratio			0.09							0.01						
95% Queue Length, Q_{95} (veh)			0.3							0.0						
Control Delay (s/veh)			10.4							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.4								0.7							
Approach LOS	B															

HCS™ TWSC Version 7.8.5
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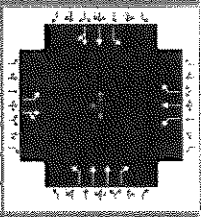
HCS7 Signalized Intersection Results Summary

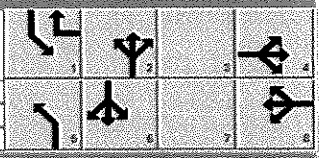
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 6, 2020	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2020	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 20.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	99	39	26	44	7	191	9	2090	84	92	981	36

Signal Information			
Cycle, s	180.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	2.2	3.7		129.9	24.2	0.0	0.0					
Yellow	3.5	0.0		5.1	3.6	0.0	0.0					
Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		30.8		30.8	8.7	136.7	12.5	140.5
Change Period, (*Y+Rc*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*gs*), s		14.9		23.2	2.3		4.5	
Green Extension Time (*ge*), s		1.9		1.0	0.0	0.0	0.3	0.0
Phase Call Probability		1.00		1.00	0.37		0.99	
Max Out Probability		0.07		0.99	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	101	66		45	7	195	9	2133	86	96	534	527
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1386	1717		1282	1900	1572	1344	1781	1610	1781	1841	1817
Queue Service Time (*gs*), s	12.3	6.3		5.9	0.6	21.2	0.3	74.8	1.5	2.5	12.6	12.5
Cycle Queue Clearance Time (*gc*), s	12.9	6.3		12.1	0.6	21.2	0.3	74.8	1.5	2.5	12.6	12.5
Green Ratio (*g/C*)	0.13	0.13		0.13	0.13	0.17	0.73	0.72	0.86	0.75	0.74	0.74
Capacity (*c*), veh/h	222	231		168	256	264	322	2570	1379	157	1367	1349
Volume-to-Capacity Ratio (*X*)	0.455	0.287		0.267	0.028	0.739	0.029	0.830	0.062	0.612	0.391	0.391
Back of Queue (*Q*), ft/ln (95 th percentile)	204.7	130.1		94.3	13	360.8	5.4	951.7	43.5	157.9	190.5	184.4
Back of Queue (*Q*), veh/ln (95 th percentile)	7.9	5.0		3.6	0.5	14.1	0.2	37.5	1.7	6.2	7.4	7.3
Queue Storage Ratio (*RQ*) (95 th percentile)	1.36	0.13		0.31	0.04	1.60	0.03	1.36	0.22	0.79	0.27	0.27
Uniform Delay (*d1*), s/veh	73.2	70.1		75.6	67.6	71.2	6.7	17.4	2.0	37.8	4.8	4.8
Incremental Delay (*d2*), s/veh	2.1	1.0		1.2	0.1	9.2	0.1	3.3	0.1	5.1	0.8	0.8
Initial Queue Delay (*d3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	75.3	71.1		76.8	67.7	80.4	6.8	20.6	2.0	42.9	5.6	5.6
Level of Service (LOS)	E	E		E	E	F	A	C	A	D	A	A
Approach Delay, s/veh / LOS	73.6	E		79.4	E		19.9	B		8.7	A	
Intersection Delay, s/veh / LOS	22.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.07	B	1.87	B
Bicycle LOS Score / LOS	0.76	A	0.90	A	2.33	B	1.42	A

HCS™ Streets Version 7.8.6

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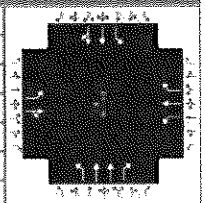
HCS7 Signalized Intersection Results Summary

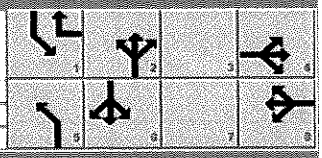
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 6, 2020	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 23 NB.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	136	55	35	45	9	197	12	2153	87	95	1011	51

Signal Information			
Cycle, s	180.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	2.7	3.2		129.2	25.0	0.0	0.0					
Yellow	3.5	0.0		5.1	3.6	0.0	0.0					
Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		31.6		31.6	9.2	136.0	12.4	139.2
Change Period, (*Y+Rc*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (*gs*), s		20.1		23.8	2.4		4.5	
Green Extension Time (*ge*), s		1.7		1.1	0.0	0.0	0.3	0.0
Phase Call Probability		1.00		1.00	0.46		0.99	
Max Out Probability		0.42		1.00	0.00		0.00	

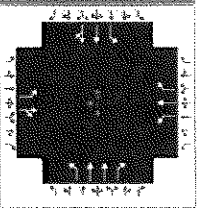
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	139	92		46	9	201	12	2197	89	95	536	526
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1384	1720		1253	1900	1572	1344	1781	1610	1781	1841	1809
Queue Service Time (*gs*), s	17.4	8.7		6.2	0.8	21.8	0.4	81.9	1.5	2.5	14.3	14.2
Cycle Queue Clearance Time (*gc*), s	18.1	8.7		15.0	0.8	21.8	0.4	81.9	1.5	2.5	14.3	14.2
Green Ratio (*g/C*)	0.14	0.14		0.14	0.14	0.17	0.73	0.72	0.86	0.75	0.74	0.74
Capacity (*c*), veh/h	226	239		153	264	270	319	2556	1379	145	1354	1330
Volume-to-Capacity Ratio (*X*)	0.613	0.385		0.300	0.035	0.744	0.038	0.860	0.064	0.653	0.396	0.396
Back of Queue (*Q*), ft/ln (95 th percentile)	272.7	182.5		98	16.6	370.9	7.2	1041.7	46.3	157.2	215.3	207.1
Back of Queue (*Q*), veh/ln (95 th percentile)	10.6	7.1		3.7	0.7	14.5	0.2	41.0	1.9	6.2	8.3	8.2
Queue Storage Ratio (*RQ*) (95 th percentile)	1.82	0.18		0.33	0.06	1.65	0.04	1.49	0.23	0.79	0.31	0.30
Uniform Delay (*d1*), s/veh	74.9	70.5		77.3	67.1	70.8	7.0	18.7	2.0	42.4	5.7	5.7
Incremental Delay (*d2*), s/veh	4.6	1.4		1.5	0.1	9.7	0.1	4.1	0.1	6.5	0.8	0.8
Initial Queue Delay (*d3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	79.5	72.0		78.9	67.2	80.5	7.0	22.8	2.1	48.9	6.5	6.5
Level of Service (LOS)	E	E		E	E	F	A	C	A	D	A	A
Approach Delay, s/veh / LOS	76.5	E		79.7	E		21.9	C		10.0	A	
Intersection Delay, s/veh / LOS	25.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.07	B	1.87	B
Bicycle LOS Score / LOS	0.87	A	0.91	A	2.38	B	1.46	A

 HCS™ Streets Version 7.8.5 Generated: 7/10/2020 5:47:47 PM

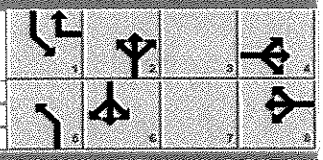
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 6, 2020	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 7:15
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown AM 23 B.xus		
Project Description	Cedar Creek Apt				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	182	73	47	45	13	197	16	2153	87	95	1011	70

Signal Information					EB			WB			NB		
Cycle, s	180.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	3.3	2.6		126.8	27.4	0.0	0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	0.0		5.1	3.6	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		34.0		34.0	9.8	133.6	12.4	136.2
Change Period, (*Y+R c*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.1		5.1	5.0	0.0	5.0	0.0
Queue Clearance Time (*g s*), s		26.9		23.5	2.6		4.6	
Green Extension Time (*g e*), s		0.5		1.4	0.0	0.0	0.2	0.0
Phase Call Probability		1.00		1.00	0.56		0.99	
Max Out Probability		1.00		1.00	0.00		0.02	

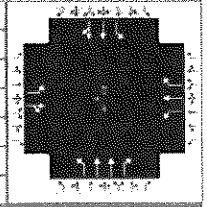
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	186	122		46	13	201	16	2197	89	93	538	526
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1378	1719		1219	1900	1572	1344	1781	1610	1781	1841	1798
Queue Service Time (*g s*), s	23.8	11.6		6.4	1.1	21.5	0.6	84.1	1.5	2.6	17.4	17.3
Cycle Queue Clearance Time (*g c*), s	24.9	11.6		18.1	1.1	21.5	0.6	84.1	1.5	2.6	17.4	17.3
Green Ratio (*g/C*)	0.16	0.16		0.15	0.15	0.19	0.72	0.71	0.86	0.74	0.72	0.72
Capacity (*c*), veh/h	249	262		147	289	291	309	2528	1379	141	1323	1292
Volume-to-Capacity Ratio (*X*)	0.746	0.468		0.313	0.046	0.690	0.053	0.869	0.064	0.664	0.407	0.407
Back of Queue (*Q*), ft/ln (95 th percentile)	364.2	231.8		98.7	23.7	361.1	10.1	1077.6	49	149.2	265.5	254
Back of Queue (*Q*), veh/ln (95 th percentile)	14.1	9.0		3.7	0.9	14.1	0.3	42.4	2.0	5.9	10.3	10.0
Queue Storage Ratio (*RQ*) (95 th percentile)	2.43	0.23		0.33	0.08	1.60	0.05	1.54	0.25	0.75	0.38	0.37
Uniform Delay (*d 1*), s/veh	74.8	68.9		77.9	65.2	68.5	7.8	20.1	2.0	42.2	7.7	7.6
Incremental Delay (*d 2*), s/veh	11.6	1.9		1.7	0.1	7.1	0.1	4.4	0.1	7.0	0.9	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	0.0
Control Delay (*d*), s/veh	86.7	70.8		79.6	65.2	75.6	7.9	24.5	2.1	49.1	8.6	8.5
Level of Service (LOS)	F	E		E	E	E	A	C	A	D	A	A
Approach Delay, s/veh / LOS	80.4	F		75.8	E		23.5	C		11.9	B	
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.32	B	2.07	B	1.88	B
Bicycle LOS Score / LOS	1.00	A	0.92	A	2.39	B	1.48	A

 HCS™ Streets Version 7.8.5 Generated: 7/10/2020 5:50:19 PM

HCS7 Signalized Intersection Results Summary

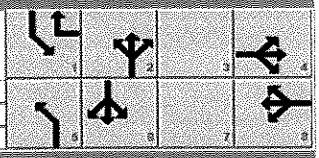
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 10, 2020	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2020	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 20.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	59	29	40	276	37	148	31	1415	63	161	2108	56

Signal Information			
Cycle, s	225.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	5.2	5.3		146.2	48.4	0.0	0.0					
Yellow	3.5	0.0		5.1	3.6	0.0	0.0					
Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	11.7	153.0	17.0	158.3
Change Period, (*Y+Rc*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.1		5.1	5.0	0.0	5.0	0.0
Queue Clearance Time (*gs*), s		13.9		51.4	3.3		10.0	
Green Extension Time (*ge*), s		3.7		0.0	0.1	0.0	0.5	0.0
Phase Call Probability		1.00		1.00	0.86		1.00	
Max Out Probability		0.00		1.00	0.00		0.14	

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	60	70		282	38	151	32	1444	64	186	1251	1251
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1370	1680		1351	1900	1610	1810	1781	1572	1810	1885	1868
Queue Service Time (*gs*), s	8.3	7.7		41.7	3.6	17.2	1.3	53.7	1.3	8.0	142.5	146.6
Cycle Queue Clearance Time (*gc*), s	11.9	7.7		49.4	3.6	17.2	1.3	53.7	1.3	8.0	142.5	146.6
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22	0.26	0.67	0.65	0.86	0.70	0.68	0.68
Capacity (*c*), veh/h	305	361		282	409	421	75	2314	1360	271	1278	1266
Volume-to-Capacity Ratio (*X*)	0.197	0.195		0.998	0.092	0.358	0.420	0.624	0.047	0.688	0.979	0.988
Back of Queue (*Q*), ft/ln (95 th percentile)	135.5	155.7		705.3	79.6	289.4	57.7	774.2	57.8	168.3	1881.6	1937.1
Back of Queue (*Q*), veh/ln (95 th percentile)	5.3	6.1		28.2	3.2	11.6	2.3	30.5	2.3	6.7	74.7	76.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.90	0.16		2.35	0.27	1.29	0.29	1.11	0.29	0.84	2.35	2.40
Uniform Delay (*d1*), s/veh	75.5	72.3		94.0	70.3	67.7	59.7	23.2	2.1	23.7	33.5	33.3
Incremental Delay (*d2*), s/veh	0.4	0.4		52.9	0.1	0.7	5.2	1.3	0.1	2.8	13.5	15.3
Initial Queue Delay (*d3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	75.9	72.7		146.9	70.5	68.4	64.9	24.5	2.2	26.5	47.0	48.6
Level of Service (LOS)	E	E		F	E	E	E	C	A	C	D	D
Approach Delay, s/veh / LOS	74.2	E		115.6	F		24.4	C		46.3	D	
Intersection Delay, s/veh / LOS	46.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	1.90	B
Bicycle LOS Score / LOS	0.70	A	1.26	A	1.76	B	2.44	B

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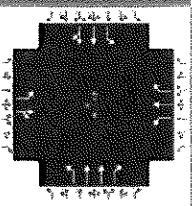
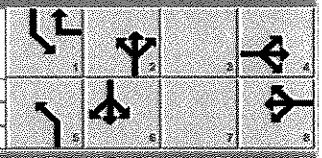
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 10, 2020	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 No Build	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 23 NB.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	37	51	284	56	152	46	1458	65	166	2172	86

Signal Information					EB			WB			NB			SB		
Cycle, s	225.0	Reference Phase	2													
Offset, s	0	Reference Point	End	Green	5.7	4.8		146.2	48.4	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	0.0		5.1	3.6	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	0.0		1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	12.2	153.0	17.0	157.8
Change Period, (*Y+Rc*), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.1		5.1	5.0	0.0	5.0	0.0
Queue Clearance Time (*gs*), s		18.5		51.4	3.9		9.9	
Green Extension Time (*ge*), s		4.1		0.0	0.1	0.0	0.5	0.0
Phase Call Probability		1.00		1.00	0.95		1.00	
Max Out Probability		0.01		1.00	0.00		0.14	

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	77	90		290	57	155	47	1488	66	184	1252	1252
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1346	1680		1328	1900	1610	1810	1781	1572	1810	1885	1860
Queue Service Time (*gs*), s	11.0	10.0		39.4	5.5	17.7	1.9	56.5	1.3	7.9	144.0	150.3
Cycle Queue Clearance Time (*gc*), s	16.5	10.0		49.4	5.5	17.7	1.9	56.5	1.3	7.9	144.0	150.3
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22	0.26	0.68	0.65	0.87	0.70	0.68	0.68
Capacity (*c*), veh/h	289	361		265	409	421	78	2315	1360	259	1274	1256
Volume-to-Capacity Ratio (*X*)	0.265	0.248		1.095	0.140	0.368	0.604	0.643	0.049	0.709	0.983	0.996
Back of Queue (*Q*), ft/ln (95 th percentile)	177	199.4		771.9	121.6	296.5	88.3	808.8	59.7	178.9	1916.7	1995.4
Back of Queue (*Q*), veh/ln (95 th percentile)	7.0	7.8		30.9	4.9	11.9	3.5	31.8	2.3	7.2	76.1	78.6
Queue Storage Ratio (*RQ*) (95 th percentile)	1.18	0.20		2.57	0.41	1.32	0.44	1.16	0.30	0.89	2.40	2.47
Uniform Delay (*d1*), s/veh	78.1	73.2		95.2	71.1	67.9	59.7	23.7	2.1	25.3	34.6	34.5
Incremental Delay (*d2*), s/veh	0.7	0.5		83.1	0.2	0.8	10.3	1.4	0.1	3.3	14.3	17.1
Initial Queue Delay (*d3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	78.8	73.7		178.2	71.3	68.6	70.0	25.1	2.2	26.6	48.8	51.6
Level of Service (LOS)	E	E		F	E	E	E	C	A	C	D	D
Approach Delay, s/veh / LOS	76.1	E		132.2	F		25.4	C		48.7	D	
Intersection Delay, s/veh / LOS	50.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	1.90	B
Bicycle LOS Score / LOS	0.76	A	1.32	A	1.81	B	2.53	C

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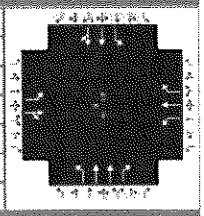
HCS7 Signalized Intersection Results Summary

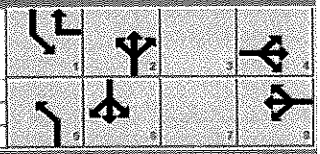
General Information				Intersection Information	
Agency	DBZ Traffic			Duration, h	0.250
Analyst	DBZ	Analysis Date	Jul 10, 2020	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.98
Urban Street	Bardstown Road	Analysis Year	2023 Build	Analysis Period	1> 4:45
Intersection	Brentlinger/Cedar Creek	File Name	Bardstown PM 23 B.xus		
Project Description	Cedar Creek Apartments				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	99	49	66	284	80	152	65	1458	65	166	2172	122

Signal Information			
Cycle, s	225.0	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	6.2	4.1	146.4	48.4	0.0	0.0	
Yellow	3.5	0.0	5.1	3.6	0.0	0.0	
Red	3.0	0.0	1.7	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		6.0		5.0	1.1	3.0	1.1	4.0
Phase Duration, s		55.0		55.0	12.7	153.2	16.8	157.3
Change Period, ($Y+R_c$), s		6.6		6.6	6.5	6.8	6.5	6.8
Max Allow Headway (*MAH*), s		5.2		5.2	5.0	0.0	5.0	0.0
Queue Clearance Time (g_s), s		25.3		51.4	6.2		9.8	
Green Extension Time (g_e), s		4.4		0.0	0.2	0.0	0.5	0.0
Phase Call Probability		1.00		1.00	0.98		1.00	
Max Out Probability		0.04		1.00	0.00		0.13	

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	101	117		290	82	155	66	1488	66	181	1253	1253
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1317	1682		1295	1900	1610	1810	1781	1572	1810	1885	1850
Queue Service Time (g_s), s	15.3	13.2		36.2	7.9	17.7	4.2	56.4	1.3	7.8	145.8	151.5
Cycle Queue Clearance Time (g_c), s	23.3	13.2		49.4	7.9	17.7	4.2	56.4	1.3	7.8	145.8	151.5
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22	0.26	0.68	0.65	0.87	0.70	0.67	0.67
Capacity (*c*), veh/h	269	362		240	409	420	82	2316	1361	259	1269	1245
Volume-to-Capacity Ratio (*X*)	0.376	0.324		1.207	0.200	0.369	0.806	0.642	0.049	0.700	0.988	1.007
Back of Queue (*Q*), ft/ln (95 th percentile)	230.8	249.8		835.6	176.3	296.6	195.1	807.6	59.6	173.2	1956.3	2044.3
Back of Queue (*Q*), veh/ln (95 th percentile)	9.1	9.8		33.4	7.1	11.9	7.8	31.8	2.3	6.9	77.6	80.5
Queue Storage Ratio (*RQ*) (95 th percentile)	1.54	0.25		2.79	0.59	1.32	0.98	1.15	0.30	0.87	2.45	2.54
Uniform Delay (d_1), s/veh	82.0	74.5		96.8	72.0	68.0	72.4	23.6	2.1	25.0	35.7	35.3
Incremental Delay (d_2), s/veh	1.2	0.7		125.6	0.3	0.8	22.3	1.4	0.1	3.1	15.2	19.6
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	0.0
Control Delay (*d*), s/veh	83.2	75.2		222.5	72.4	68.7	94.8	25.0	2.2	28.1	50.9	54.9
Level of Service (LOS)	F	E		F	E	E	F	C	A	C	D	F
Approach Delay, s/veh / LOS	78.9	E		153.9	F		26.9	C		51.2	D	
Intersection Delay, s/veh / LOS	55.3						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.48	B	2.33	B	2.09	B	1.90	B
Bicycle LOS Score / LOS	0.85	A	1.36	A	1.82	B	2.56	C

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