Devils Glen Apartments

Traffic Impact Study

Bettendorf, IA

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Traffic Impact Study:
Devils Glen Apartments

Bettendorf, Iowa

June 7, 2022

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Executive Summary

David Kempen, CCIM initiated this traffic impact study to identify potential traffic impacts on the adjacent roadway network and provide traffic mitigation measures, if necessary, due to their proposed residential development. The proposed development consists of four three story apartment buildings containing 114 dwelling units, as well as 12 townhouses totaling 126 residential dwelling units. The sole access point will be located at 1200 Devils Glenn Road, which is north of Central Avenue, west of Devils Glen Road, and east of Duck Creek Trail Parkway. The access point is anticipated to be a full access point with no turning movement restrictions. Sight visibility zones corresponding to intersection sight distance calculations as defined through AASHTO should be identified and maintained at this access point. These zones should not contain structures or plantings that would preclude unobstructed views of oncoming traffic. Current designs for the development do not indicate obstructions within the sight visibility zones. Opening and design analysis years are assumed to be 2023 and 2043, respectively.

IDOT Bureau of Data Collection provided intersection related crash data at the study intersection for the ten-year period between January 1, 2011 and December 31, 2020. Over this period a total of 56 crashes were reported at the study intersections. It should be noted study intersections #1 is not an existing intersection and therefore does not have a crash history. This intersection will become the sole access point and be constructed in conjunction with the proposed development.

Traffic Signal Warrant 1 – Eight Hour Vehicular Volume and Traffic Signal Warrant 2 – Four-Hour Vehicular Volume were analyzed herein. Based on this analysis neither signal warrant was met.

A two-way stop control (TWSC) turn-bay guideline analysis was performed on study intersections #1 and #2. Based on this analysis no approach meets the TWSC guideline for a dedicated turn bay

The analysis presented herein indicates all the study intersections will operate at acceptable LOS D or better and with no more than one approach at LOS E or worse during the AM and PM peak hour conditions through 2043 with buildout of the proposed development. This determination assumes the recommended lane configuration and control presented in Figure 16. No other changes/improvements to the study intersections lane configuration and control from what is depicted in Figure 16 are considered necessary as mitigation for the proposed development. It should be noted the southbound right-turn bay at study intersection #1 is recommended to improve safety. The 95th percentile queues at the study intersections were also analyzed and no issues, such as a queue extending upstream to an adjacent intersection are anticipated. Operational analysis worksheets are contained in Appendix 3.

Existing & Projected No Build Conditions

David Kempen, CCIM initiated this traffic impact study to identify potential traffic impacts on the adjacent roadway network and provide traffic mitigation measures, if necessary, due to their proposed residential development. The sole access point will be located at 1200 Devils Glenn Road, which is north of Central Avenue, west of Devils Glen Road, and east of Duck Creek Trail Parkway. The access point is anticipated to be a full access point with no turning movement restrictions. Opening and design analysis years are assumed to be 2023 and 2043, respectively.

The following study intersections within the study area were identified for analysis:

1. Devils Glen Road & Access Point
2. Devils Glen Road & Central Avenue
3. Devils Glen Road & State Street

The above list assigns each study intersection with a number used throughout the report. (e.g. #2 = Devils Glen Road and Central Avenue). Study intersections #1 is not an existing intersection. This intersection will become the sole access point and be constructed in conjunction with the proposed development.

The area immediately surrounding the study intersection generally incorporates industrial, retail, services, and residential land uses. A study area map identifying the location of the study intersections, as well the location of proposed development is depicted in the following figure.

Figure 1 Study Area Map

Adjacent Streets

The following descriptions are specific to the area near the study intersections. The roadway functional classifications are taken from the 2050 Quad Cities Long Range Transportation Plan Existing Roadway Network Map.

Devils Glen Road is a north/south four-lane (two through lanes in each direction) minor arterial roadway. On-street parking is prohibited along Devils Glen Road, the total roadway width is 50 feet, and the posted speed limit is 35 mph.

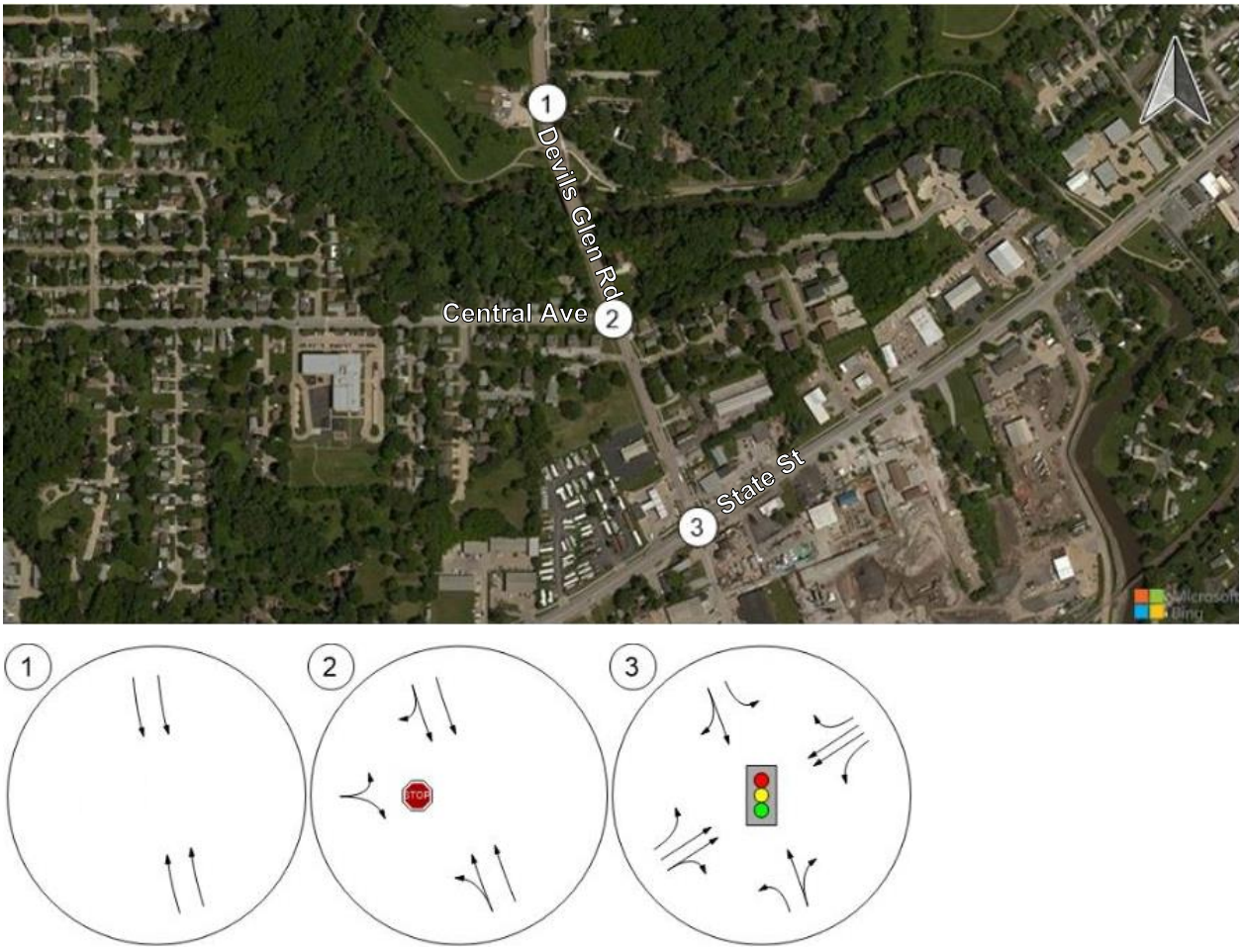
Central Avenue is an east/west two-lane (one through lane in each direction) minor arterial roadway. On-street parking is permitted along the westbound lane along Devils Glen Road, the total roadway width is 34 feet, and the posted speed limit is 25 mph.

State Street is an east/west five-lane (two through lanes in each direction with a center two-way left-turn lane [TWLTL]) principal arterial roadway. On-street parking is prohibited along State Street, the total roadway width is 60 feet, and the posted speed limit is 40 mph.

Existing Intersection Conditions

The existing lane configurations and control for the study intersections are presented in the following figure.

Figure 2 Study Intersections - Existing (2022) Lane Configuration and Control



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Traffic Volume Data

Weekday turning movement volumes were collected at the study intersections in late March 2022. The peak hours of the study intersections were determined based on the highest consecutive four 15-minute turning movement counts between the hours of 6:00 and 9:00 AM and 3:00 and 6:00 PM, respectively at the Devils Glen Road and State Street (study intersection #3) intersection. The AM and PM peak hours at the Devils Glen Road and State Street (study intersection #3) intersection governed the AM and PM peak hours at the study intersections because it is the study intersection with the highest volume of entering vehicles. The AM peak hour was determined to occur between 7:00 and 8:00. The PM peak hour was determined to occur between 3:00 and 4:00. The raw and refined volume data are provided in Appendix 1.

Background Traffic Growth

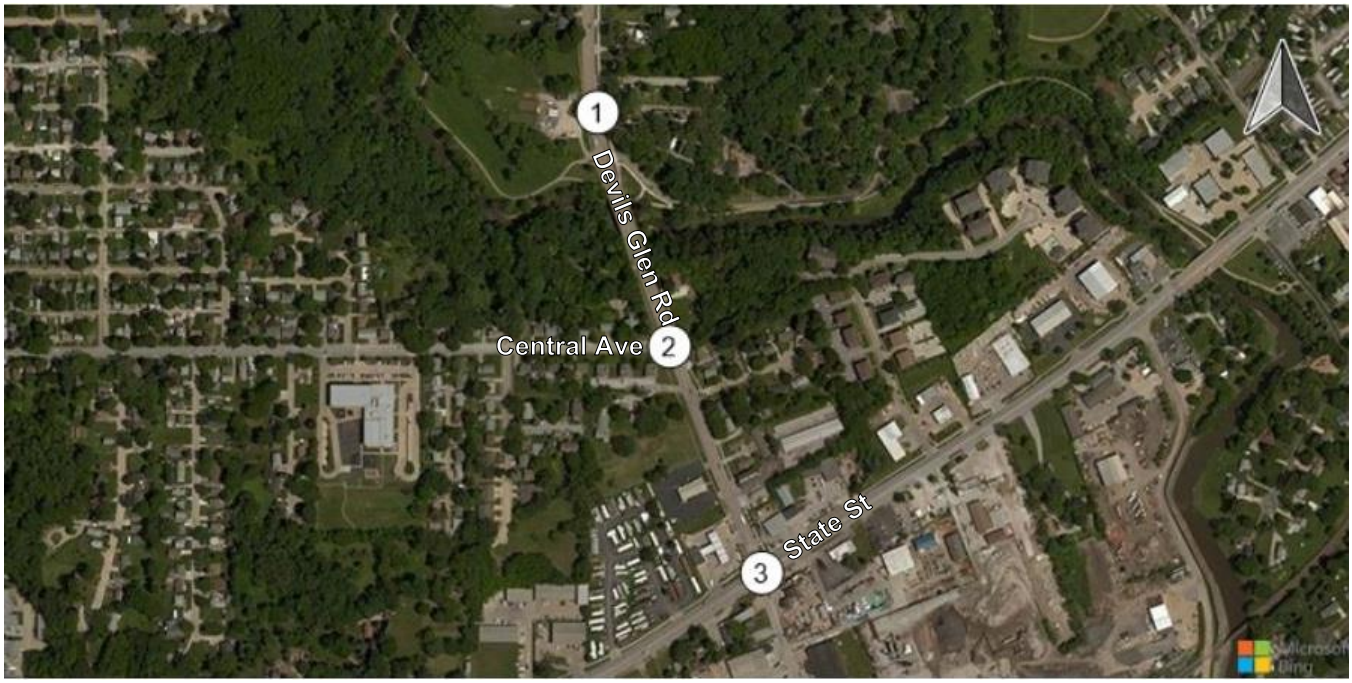
Projected traffic analysis will typically apply an annual growth rate to study intersections' existing turning movement volumes prior to adding project development trips to account for growth in background traffic (traffic growth unrelated to the proposed development). In coordination with the Bi-State Regional Commission annual growth rates were identified. The following table identifies the annual growth rates applied to the study intersections turning movement volumes to reflect future volumes without the proposed development.

Table 1 Annual Growth Rates

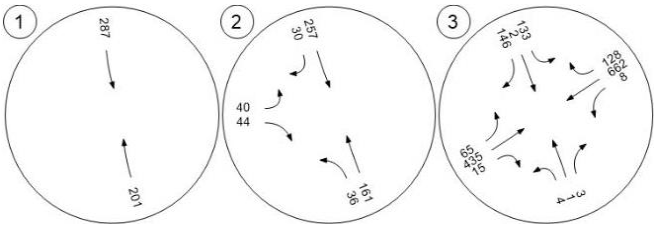
Roadway	Segment	2022-2023	2023-2033	2033-2043
Devils Glen Road	NA	-5.72%	-4.00%	0.00%
State Street	West of Devils Glen Road	-0.95%	-0.63%	0.11%
	East of Devils Glen Road	0.67%	0.51%	0.13%
Central Avenue	NA	1.43%	1.00%	0.00%

All other traffic volume growth/decline generated by developments or lack thereof in the area that will or will not be constructed between 2022 and 2043 are assumed to be included in the annual traffic volume growth rates. It should be noted the annual growth rates were not applied to future entering and exiting volumes at the proposed access point (new trips generated by the proposed development). Existing and projected AM and PM peak hour no build volumes (without the proposed development) are presented in the following figure.

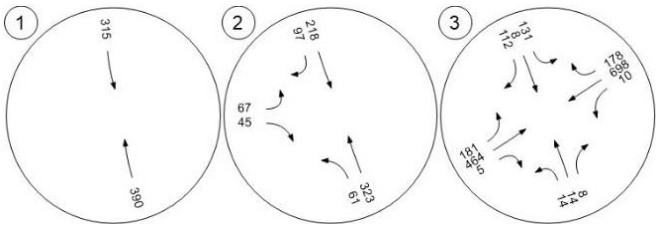
Figure 3 Study Intersections – Existing & Projected Peak Hour No Build Volumes



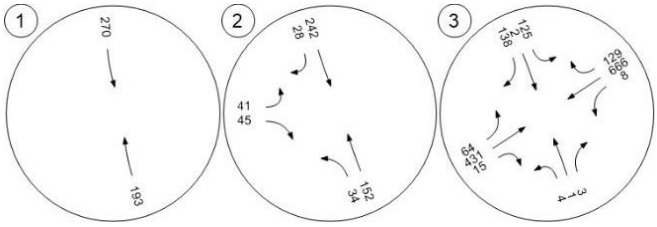
2022 AM Peak Hour



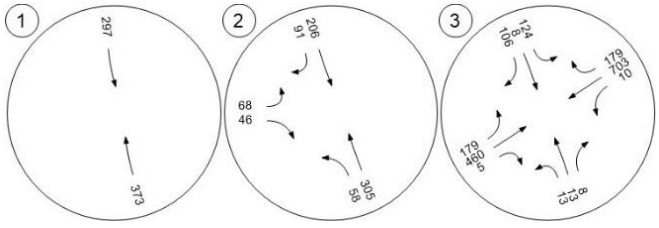
2022 PM Peak Hour



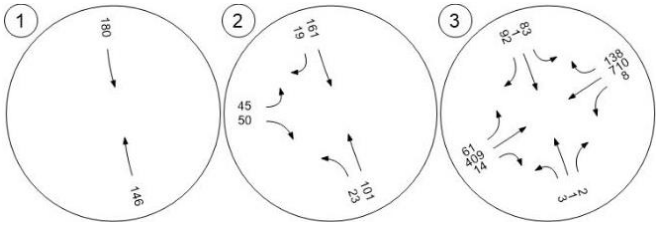
2023 AM Peak Hour



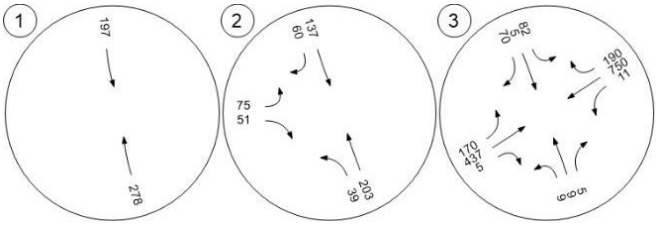
2023 PM Peak Hour



2043 AM Peak Hour



2043 PM Peak Hour



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Crash Analysis

IDOT Bureau of Data Collection provided intersection related crash data at the study intersection for the ten-year period between January 1, 2012 and December 31, 2021. Over this period a total of 56 crashes were reported at the study intersections. It should be noted study intersections #1 is not an existing intersection and therefore does not have a crash history. This intersection will become the sole access point and be constructed in conjunction with the proposed development.

Intersection crash rates are expressed in crashes per million entering vehicles (crashes/MEV) and can be calculated with the following equation:

$$\text{Crash Rate} = \frac{1{,}000{,}000 \times \text{Total Crashes}}{\text{AADT}_{\text{Entering vpd}} \times 365 \times \#\text{ of Years in Study Period}}$$

The following table summarizes crash rates at the study intersections and compares them to average statewide crash rates for intersections with a similar volume of entering vehicles. For the purposes of this analysis, the weekday PM peak hour entering traffic volume at the study intersections was assumed to be 10% of the daily weekday entering volume, which is standard for urban intersections and is consistent with the methodology used by the Federal Highway Administration. The statewide average crash rate for intersections with a similar volume of entering vehicles was prepared by the Iowa DOT, Bureau of Transportation Safety.

Table 2 Intersection Crash Rate Summary (1/1/12 – 12/31/21)

Study Intersection		Total Crashes	Daily Entering Volume	Crash Rate (crashes/MEV)	Statewide Average Crash Rate (crashes/MEV)	Comparison to Statewide Average Crash Rate
1	Devils Glen Road & Central Avenue	16	8,110	0.54	0.70	**Lower**
2	Devils Glen Road & State Street	40	18,230	0.60	0.80	**Lower**

Source: Iowa Department of Transportation, Bureau of Transportation Safety.

All the study intersections had crash rates lower than the statewide average for intersections with a similar daily volume of entering vehicles.

The following table presents crash statistics at each study intersection organized by manner of collision or crash type. For the purposes of this analysis, 10 or more of the same crash type over the ten-year analysis period was identified as a trend. Identified crash trends are highlighted in the following table.

Table 3 Crash Type by Intersection (1/1/12 – 12/31/21)

Study Intersection		Manner of Collision							
		Non-Collision (Single Vehicle)	Head On	Rear End	Angle, Oncoming Left	Broadside	Sideswipe, Same Direction	Other	Total
1	Devils Glen Road & Central Avenue	0	0	5	1	8	1	1	**16**
2	Devils Glen Road & State Street	6	1	17	9	5	2	0	**40**

Source: Iowa Department of Transportation, Bureau of Transportation Safety.

The following crashes trends were identified:

- Devils Glen Road & State Street (study intersection #2) rear-end type crashes

While it is common to refer to the “cause” of a crash, in reality, most crashes cannot be related to a singular causal event. Instead, crashes are the result of a convergence of a series of events that are influenced by a number of contributing factors (time of day, driver attentiveness, speed, vehicle condition, road design, etc.).

These contributing factors influence the sequence of events before, during, and after a crash. In some cases, the roadway/intersection configuration and traffic control may affect the expected average crash frequency. The quantification of this effect is referred to as a crash modification factor (CMF). CMF is an index of how much crash experience is expected to change following a modification in design or traffic control. CMF is the ratio between the number of crashes per unit of time expected after a modification or measure is implemented and the number of crashes per unit of time estimated if the change does not take place. (Highway Safety Manual, 2010).

The CMF Clearinghouse website, which is administered by the Federal Highway Administration, provides a library of CMFs for various modifications to intersections and roadways. The following table provides several potential treatments and their expected percent reduction in crash frequency for rear-end type crashes.

Table 4 Potential Intersection Treatments to Reduce Crash Frequency

Crash Type Applicability	Treatment	CMF ID	Expected Reduction in Crash Frequency and notes
Rear End	Implement automated speed enforcement cameras	2913	-26%, This CMF applies to all crash severities.
	Install pedestrian countdown timer	8793	-8%, This CMF applies to all crash severities
	Implement systemic signing and visibility improvements at signalized intersections	8924	-.026%, This CMF applies to all crash severities

Source: Federal Highway Administration

The following table presents crash injury statistics at the study intersections organized by severity.

Table 5 Crash Severity at each Intersection (1/1/12 – 12/31/21)

Study Intersection		Number of Crashes	Crash Severity					
			Fatal	Suspected Injury		Possible Injury	Property Damage Only	Injuries per Crash
				Serious	Minor			
1	Devils Glen Road & Central Avenue	**16**	0	0	3	3	10	0.56
2	Devils Glen Road & State Street	**40**	0	2	8	6	24	0.68

Study intersection crash data for the analysis period is provided in Appendix 2.

Multimodal Review

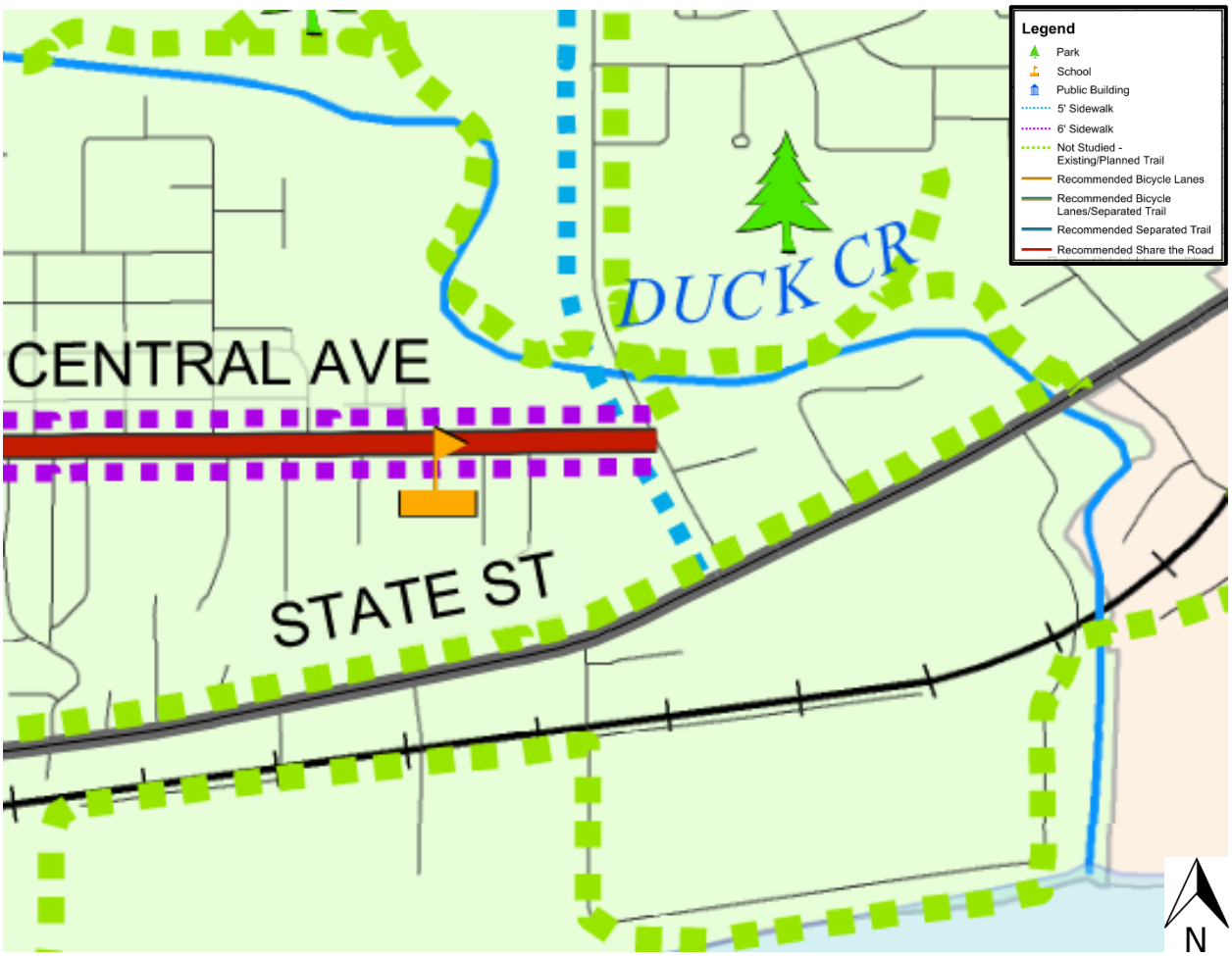
Bettendorf Transit provides public transportation service for the study area. Route 1 Red and Route 2 Blue pass through the study area. Their routes and bus stop locations (identified as a square) are shown in the figure below.

Figure 4 Route 1 Red & Route 2 Blue

Sidewalks extend along adjacent streets in the study area.

The figure below presents the applicable study area of the Bettendorf, Iowa Trails System Map

Figure 5 Bettendorf, Iowa Trails System Map (Study Area)

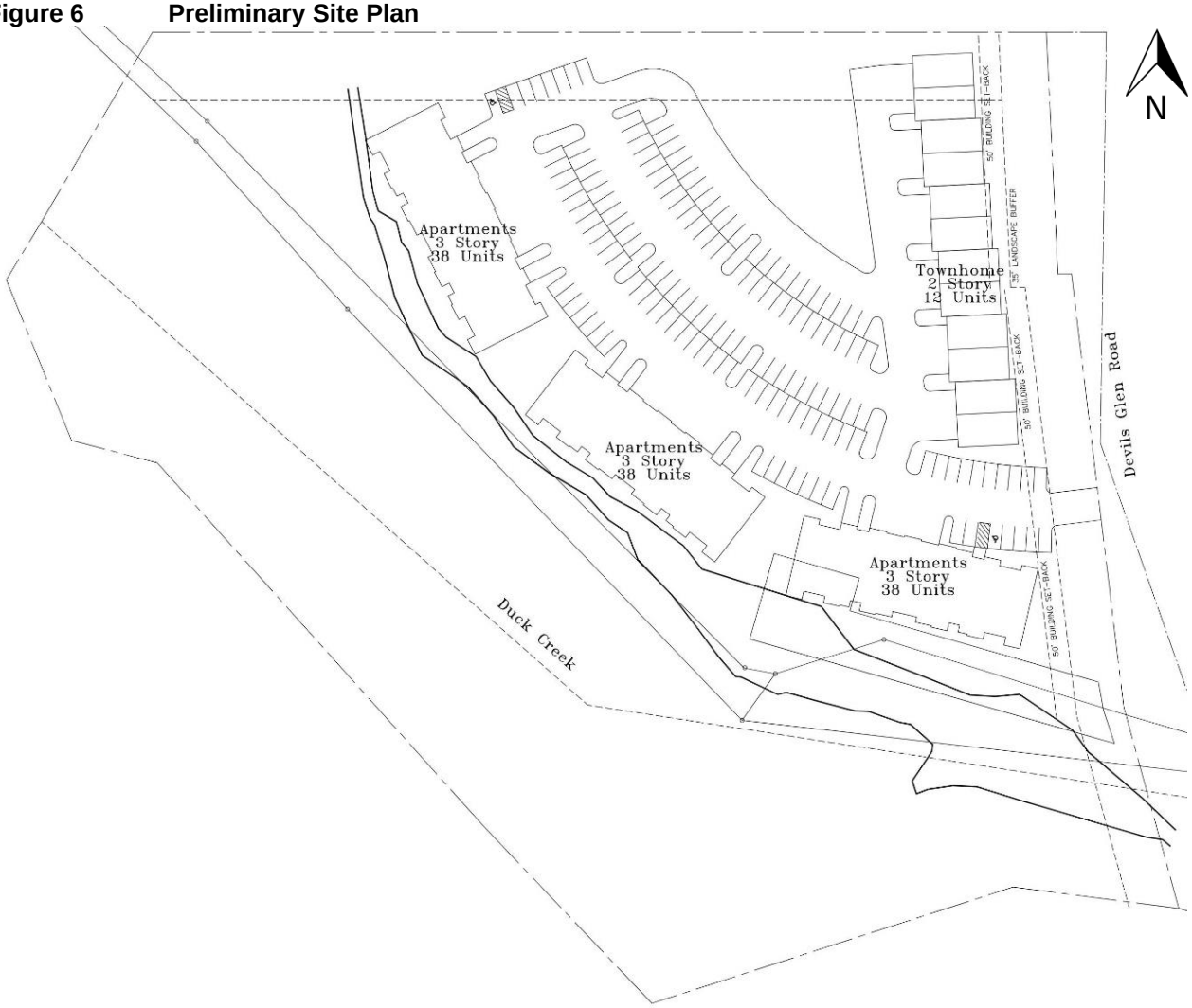


Projected Buildout Conditions & Mitigation

Development Description

The proposed development consists of four three story apartment buildings containing 114 dwelling units, as well as 12 townhouses totaling 126 residential dwelling units. The sole access point will be located at 1200 Devils Glenn Road, which is north of Central Avenue, west of Devils Glen Road, and east of Duck Creek Trail Parkway and will serve as the eastbound approach to its intersection with Devils Glen Road. The access point is anticipated to be a full access point with no turning movement restrictions. Sight visibility zones corresponding to intersection sight distance calculations as defined through AASHTO should be identified and maintained at this access point. These zones should not contain structures or plantings that would preclude unobstructed views of oncoming traffic. Current designs for the development do not indicate obstructions within the sight visibility zones. Opening and design analysis years are assumed to be 2023 and 2043, respectively. The preliminary site plan is presented in the figure below.

Figure 6 Preliminary Site Plan



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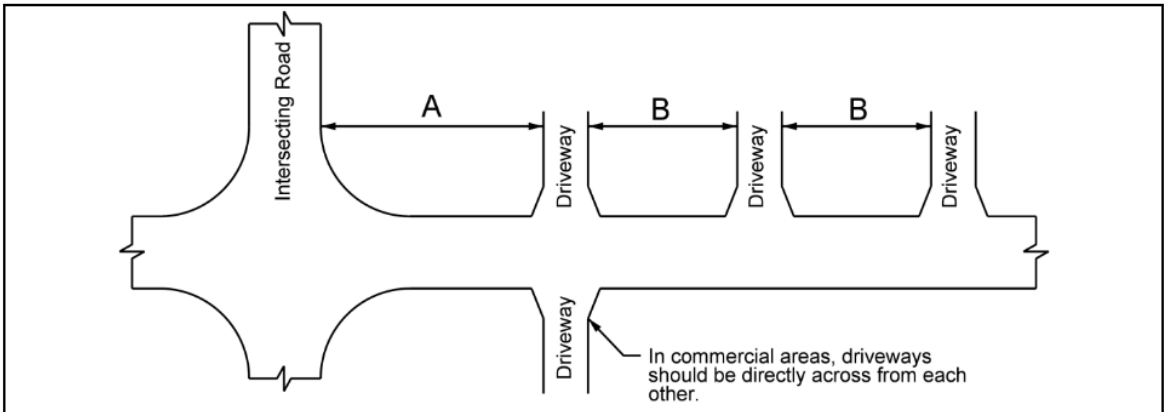
Access Management & Spacing

Motorists are more likely to make mistakes and are more likely to be involved in collisions when they are presented with complex driving situations created by numerous conflict points. Providing adequate distances between conflict areas (i.e., intersections and access points) enables motorists to address one potential set of conflicts at a time. Higher classification roadways (arterials and collectors) will generally require greater separation distances between access points due to higher traffic speeds and volumes, as well as greater number of lanes, which increase the number of conflict points and complexity of motorist's decision making.

The sole access point is anticipated to be full access points with no turning movement restrictions. The roadway functional classifications are taken from the 2050 Quad Cities Long Rong Transportation Plan Existing Roadway Network Map. It should be noted Devils Glen Road is classified as a minor arterial roadway.

The following table identifies the minimum distances for intersections and access points along minor arterials, collectors, and local roads based on Statewide Urban Design and Specifications (SUDAS) Chapter 5 – Roadway Design, Section 5L – 3 – Access Location, Spacing, Turn Lanes, and Median, Table 5L – 3.05: Minimum Distance between Driveways or from Intersecting Streets.

Table 6 Minimum Distance between Driveways or from Intersecting Streets



	Minor Arterial			Collector			Local		
	Res. Area	*C/ I Area*	*Ag Area*	*Res. Area*[3]	*C/I Area*	*Ag Area*	*Res. Area*[3]	*C/I Area*	*Ag Area*
A. Minimum intersection clearance[1]	145'	170'	300'	100'	100'	300'	75'	75'	150'
B. Minimum driveway spacing[2]	100'	200'	300'	75'	100'	300'	---[4]	---[4]	150'

Res = Residential, C/I = Commercial/Industrial

[1] Values are measured from the back of the curb, intersecting road to the adjacent driveway near edge. Distance may be adjusted due to lot dimension or zoning code.

[2] Values are measured between driveway edges.

[3] One access drive allowed per lot. Depending on lot size, an additional drive may be allowed upon approval of the Jurisdiction.

[4] See Jurisdictional Engineer for local requirements.

The following table identifies SUDAS guidelines as they relate to intersection and driveway (access point) spacing and determines if the proposed development's access point is compliant (non- compliant highlighted in yellow).

Table 7 SUDAS Intersection & Access Spacing Compliance

Study Intersection		Functional Classification	Area Description	Intersection Spacing			Driveway (Access Point) Spacing		
				Minimum Intersection Distance (ft)	Distance from Intersection (ft)	Compliant?	Minimum Driveway Spacing (ft)	Distance from Driveway (ft)	Compliant?
1	Devils Glen Road & Access Point	Minor Arterial	Residential	145	800	Yes	100	NA	NA

[1] SUDAS does not identify local roadway driveway spacing, requirements are set by local jurisdiction.

Based on estimated measurements in the preliminary site plan the sole access point is SUDAS compliant.

Trip Generation

The proposed development's trip generation is based on nationally accepted trip generation rates and fitted curve equations contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. Trips were generated for the expected type of land use proposed herein (Multifamily Housing [Mid-Rise], ITE 221 and Single Family Detached Housing [townhouses], ITE 210) and correspond to the AM and PM peak hour of the adjacent roadway network. The following table identifies the ITE land use, ITE land use code, and independent variable use to calculate the trip generation estimate for the development.

Table 8 Trip Generation

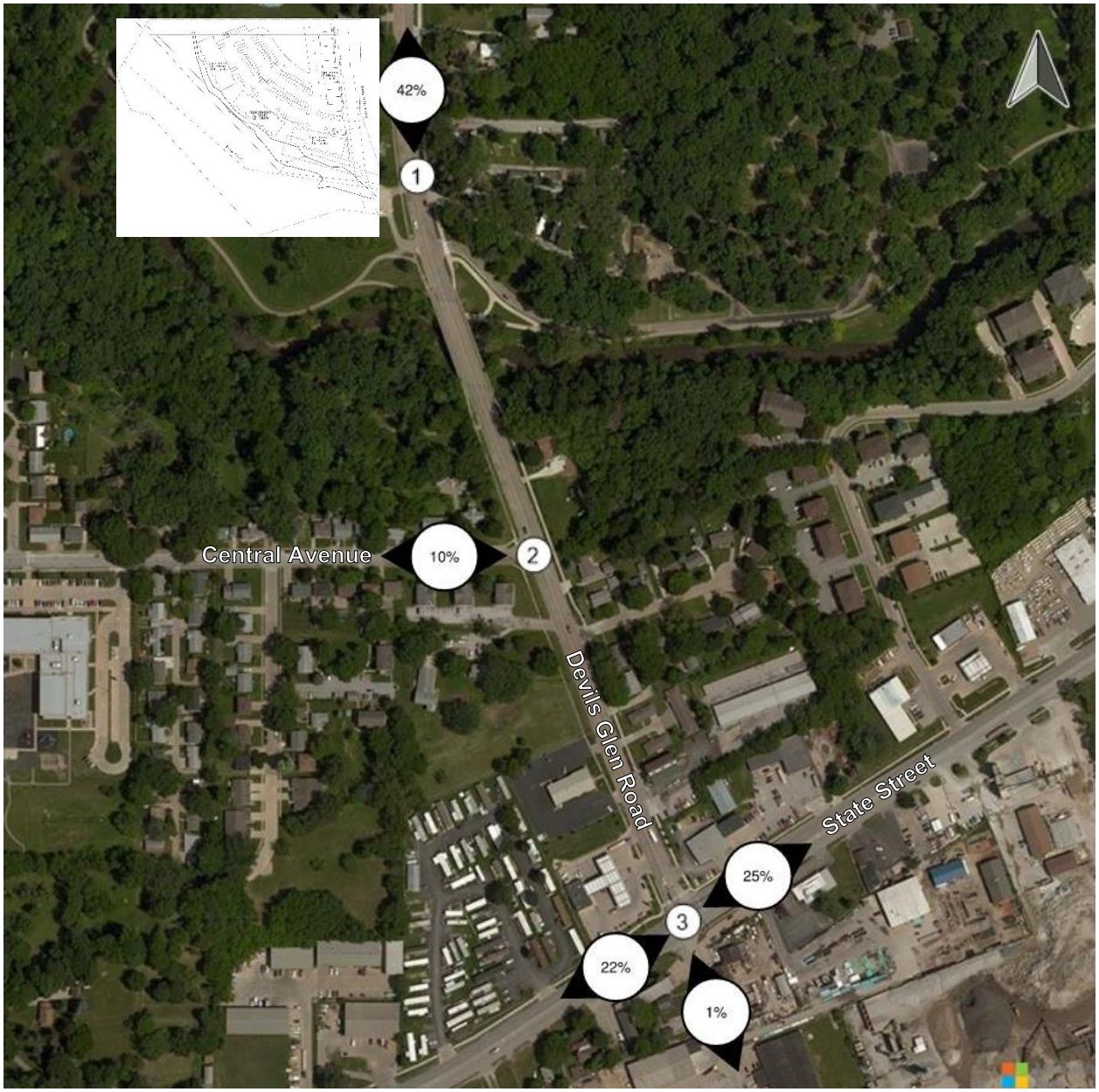
Land Use	ITE Code [1]	Quantity	Weekday Trips	AM Peak Hour					PM Peak Hour				
				Trips	% In	% Out	Trips In	Trips Out	Trips	% In	% Out	Trips In	Trips Out
Multifamily Housing (Mid-Rise)	221	114 DU [2]	620 [3]	41	26%	74%	11	30	50	61%	39%	30	20
Single-Family Detached Housing	210	12 DU [2]	148 [4]	13 [5]	25%	75%	3	10	13 [6]	63%	37%	8	5
Totals			**768**	**54**	**26%**	**74%**	**14**	**40**	**63**	**60%**	**40%**	**38**	**25**

[1] Institute of Transportation Engineers Trip Generation Handbook, 10th Edition, 2017
[2] DU = Dwelling Units
[3] Fitted curve equation T = 5.45(X) – 1.75 was used (R^2 = 0.77)
[4] Fitted curve equation Ln(T) = 0.92 Ln(X) + 2.71 was used (R^2 = 0.95)
[5] Fitted curve equation T = 0.71(X) + 4.80 was used (R^2 = 0.89)
[6] Fitted curve equation Ln(T) = 0.96 Ln(X) + 0.20 was used (R^2 = 0.92)

Trip Distribution

Trip distribution percentages for the proposed development are based upon existing traffic patterns observed in the collected AM and PM peak hour turning movement volumes, as well as expected travel patterns in the surrounding roadway network over the 2043 design year and are presented in the following figure.

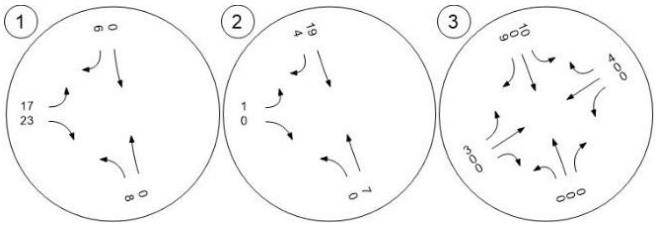
Figure 7 Trip Distribution



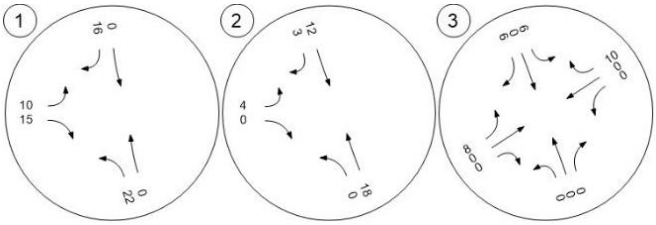
AM and PM peak hour generated trips are presented in the following figure. Please note the number of trips may differ slightly from the calculations above due to rounding.

Figure 8 **Study Intersections – AM & PM Peak Hour Development Trips & Projected Peak Hour Buildout Volumes**

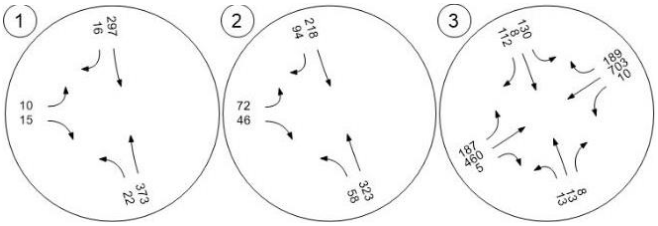
AM Peak Hour Trips



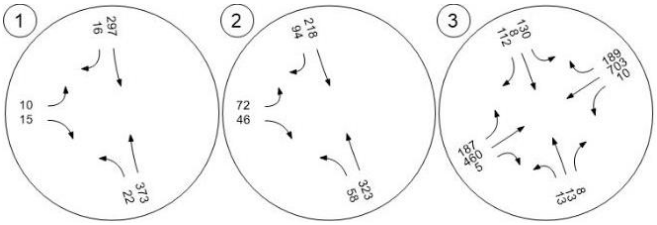
PM Peak Hour Trips



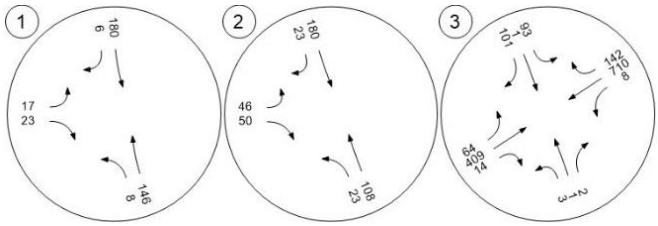
2023 AM Peak Hour



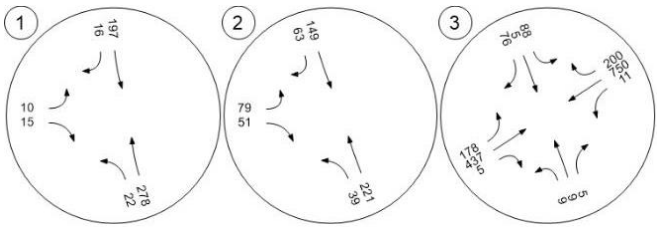
2023 PM Peak Hour



2043 AM Peak Hour



2043 PM Peak Hour



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The following tables present turning movement volumes at the study intersection organized by the following volume classifications:

- Existing 2022
- Projected 2023 No Build
- Development Trips
- Background Traffic Growth (2022-2043)
- Projected 2043 No Build
- Projected 2023 Buildout
- Projected 2043 Buildout

Background traffic growth is calculated by subtracting existing 2022 volumes from projected 2043 no build volumes. The raw and refined volume data are provided in Appendix 1.

Table 9 AM Peak Hour Turning Movement Volumes

#1 Devils Glen Road & Access Point													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound NA			Northbound Devils Glen Road			Eastbound Access Point			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	0	287	0	0	0	0	0	201	0	0	0	0	**488**
Projected 2023 No Build	0	270	0	0	0	0	0	193	0	0	0	0	**463**
Development Trips	0	0	6	0	0	0	8	0	0	17	0	23	**54**
Background Traffic Growth (2022 – 2043)	0	-107	0	0	0	0	0	-55	0	0	0	0	**-162**
Projected 2043 No Build	0	180	0	0	0	0	0	146	0	0	0	0	**326**
Projected 2023 Buildout	0	180	6	0	0	0	8	146	0	17	0	23	**380**
Projected 2043 Buildout	0	180	6	0	0	0	8	146	0	17	0	23	**380**
#2 Devils Glen Road & Central Avenue													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound NA			Northbound Devils Glen Road			Eastbound Central Avenue			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	0	257	30	0	0	0	36	161	0	40	0	44	**568**
Projected 2023 No Build	0	242	28	0	0	0	34	152	0	41	0	45	**542**
Development Trips	0	19	4	0	0	0	0	7	0	1	0	0	**31**
Background Traffic Growth (2022 – 2043)	0	-96	-11	0	0	0	-13	-60	0	5	0	6	**-169**
Projected 2043 No Build	0	161	19	0	0	0	23	101	0	45	0	50	**399**
Projected 2023 Buildout	0	261	32	0	0	0	34	159	0	42	0	45	**573**
Projected 2043 Buildout	0	180	23	0	0	0	23	108	0	46	0	50	**430**
#3 Devils Glen Road & State Street													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound State Street			Northbound Devils Glen Road			Eastbound State Street			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	133	2	146	8	662	128	4	1	3	65	435	15	**1,602**
Projected 2023 No Build	125	2	138	8	666	129	4	1	3	64	431	15	**1,586**
Development Trips	10	0	9	0	0	4	0	0	0	3	0	0	**26**
Background Traffic Growth (2022 – 2043)	-50	-1	-54	0	48	10	-1	0	-1	-4	-26	-1	**-80**
Projected 2043 No Build	83	1	92	8	710	138	3	1	2	61	409	14	**1,522**
Projected 2023 Buildout	135	2	147	8	666	133	4	1	3	67	431	15	**1,612**
Projected 2043 Buildout	93	1	101	8	710	142	3	1	2	64	409	14	**1,548**

Table 10 PM Peak Hour Turning Movement Volumes

#1 Devils Glen Road & Access Point													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound NA			Northbound Devils Glen Road			Eastbound Access Point			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	0	315	0	0	0	0	0	390	0	0	0	0	**705**
Projected 2023 No Build	0	297	0	0	0	0	0	373	0	0	0	0	**670**
Development Trips	0	0	16	0	0	0	22	0	0	10	0	15	**63**
Background Traffic Growth (2022 – 2043)	0	-118	0	0	0	0	0	-112	0	0	0	0	**-230**
Projected 2043 No Build	0	197	0	0	0	0	0	278	0	0	0	0	**475**
Projected 2023 Buildout	0	297	16	0	0	0	22	373	0	10	0	15	**733**
Projected 2043 Buildout	0	197	16	0	0	0	22	278	0	10	0	15	**538**
#2 Devils Glen Road & Central Avenue													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound NA			Northbound Devils Glen Road			Eastbound Central Avenue			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	0	218	97	0	0	0	61	323	0	67	0	45	**811**
Projected 2023 No Build	0	206	91	0	0	0	58	305	0	68	0	46	**774**
Development Trips	0	12	3	0	0	0	0	18	0	4	0	0	**37**
Background Traffic Growth (2022 – 2043)	0	-81	-37	0	0	0	-22	-120	0	8	0	6	**-246**
Projected 2043 No Build	0	137	60	0	0	0	39	203	0	75	0	51	**565**
Projected 2023 Buildout	0	218	94	0	0	0	58	323	0	72	0	46	**811**
Projected 2043 Buildout	0	149	63	0	0	0	39	221	0	79	0	51	**602**
#3 Devils Glen Road & State Street													
Traffic Volume Classification	Southbound Devils Glen Road			Westbound State Street			Northbound Devils Glen Road			Eastbound State Street			Int. Count
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing 2022	131	8	112	10	698	178	14	14	8	181	464	5	**1,823**
Projected 2023 No Build	124	8	106	10	703	179	13	13	8	179	460	5	**1,808**
Development Trips	6	0	6	0	0	10	0	0	0	8	0	0	**30**
Background Traffic Growth (2022 – 2043)	-49	-3	-42	1	52	12	-5	-5	-3	-11	-27	0	**-80**
Projected 2043 No Build	82	5	70	11	750	190	9	9	5	170	437	5	**1,743**
Projected 2023 Buildout	130	8	112	10	703	189	13	13	8	187	460	5	**1,838**
Projected 2043 Buildout	88	5	76	11	750	200	9	9	5	178	437	5	**1,773**

Traffic Signal Control Warrant Analysis

The justification to install a traffic signal is generally obtained through a traffic signal warrant analysis. The traffic signal warrant analysis presented herein was performed under the guidelines and procedures as outlined in the 2009 Manual of Uniform Traffic Control Devices (MUTCD). The MUTCD states the satisfaction of a traffic control warrant or warrants does not in itself require a modification to the existing traffic control. In general, a modification to an existing traffic control should not be made unless analysis indicates it will improve the overall safety and/or operations of the intersection. The ultimate decision resides on engineering judgement.

Signal warrant analysis will typically analyze the opening buildout year and ten years after the proposed opening buildout year, which correspond to projected 2023 and 2033 conditions. For the purposes of comparison projected 2023 and 2033 no build and buildout conditions were analyzed. Traffic volumes were projected using the previously identified annual growth rates.

The following traffic signal warrant analysis will focus on Traffic Signal Warrant 1 – Eight Hour Vehicular Volume, which has two sub conditions (Condition A – Minimum Vehicular Volume and Condition B – Interruption of Continuous Traffic and Traffic Signal Warrant 2 – Four-Hour Vehicular Volume at study

intersection #2. Analysis of other study intersections was deemed unnecessary. Additional traffic signal warrants were considered and dismissed as not applicable to this project area. It should be noted both Devils Glen Road and Central Avenue are classified as minor arterial roadways. However, for the purposes of the analysis presented herein Devils Glen Road and Central Avenue are considered the major and minor roadways, respectively.

Condition A – Minimum Vehicular Volume

The Minimum Vehicular Volume (Condition A) is intended for application where a large volume of intersecting traffic is the principal reason for the signalization of an intersection. This warrant is satisfied when the traffic volumes presented in the following table exist on the major street and on the higher volume minor street approach for all eight selected hours of an average day. For the purposes of this analysis the hours between 6:00 AM and 6:00 PM were analyzed. The row highlighted in blue is applicable to study intersection #2.

Table 11 Warrant 1 – Eight-Hour Vehicular Volume (Condition A)

Number of lanes on each approach		Vehicles per hour on major street (total on both approaches)	Vehicles per hour on higher volume minor street approach
Major Street	**Minor Street**		
1	1	500	150
2 or more	1	600	150
2 or more	2 or more	600	200
1	2 or more	500	200

Source: Manual of Uniform Traffic Control Devices, December 2009

Condition B – Interruption of Continuous Traffic

The Interruption of Continuous Traffic (Condition B) is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersection street suffers excessive delay or conflict in entering or crossing the major street. This warrant is satisfied when the traffic volumes presented in the following table exist on the major street and on the higher volume minor street approach to the intersections for all eight selected hours of an average day. For the purposes of this analysis the hours between 6:00 AM and 6:00 PM were analyzed. The row highlighted in blue is applicable to study intersection #1.

Table 12 Warrant 1 – Eight-Hour Vehicular Volume (Condition B)

Number of lanes on each approach		Vehicles per hour on major street (total on both approaches)	Vehicles per hour on higher volume minor street approach
Major Street	**Minor Street**		
1	1	750	75
2 or more	1	900	75
2 or more	2 or more	900	100
1	2 or more	750	100

Source: Manual of Uniform Traffic Control Devices, December 2009

The MUTCD states that Warrant 1 is to be treated as a single warrant. If Condition A is satisfied, then Warrant 1 is satisfied and analyses of Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then Warrant 1 is satisfied and an analysis of the combination of Conditions A and B is not needed.

The following tables presents the traffic volume data used to determine if Warrant 1 – Eight Hour Vehicular Volume is met at study intersection #2 under projected 2023 and 2033 conditions. The green highlighted cells in the following tables indicates a condition that has been met, as well as if the overall warrant was met.

Table 13 Warrant 1 – Eight-Hour Vehicular Volume (Condition A & B) Study Intersection #1

Time	#2 Devils Glen Road & Central Avenue							
	Projected 2023 No Build Conditions				Projected 2023 Buildout Conditions			
	Major Roadway	Minor Roadway	Warrant 1 Met?		Major Roadway	Minor Roadway	Warrant 1 Met?	
	Devils Glen Road	Central Avenue (Highest Volume Leg)	Condition A	Condition B	Devils Glen Road	Central Avenue (Highest Volume Leg)	Condition A	Condition B
6 – 7 AM	287	57	No	No	309	58	No	No
7 – 8 AM	456	85	No	No	486	86	No	No
8 – 9 AM	502	102	No	No	536	104	No	No
9 – 10 AM	311	56	No	No	334	58	No	No
10 – 11 AM	323	70	No	No	343	71	No	No
11 – 12 AM	422	70	No	No	446	72	No	No
12 – 1 PM	502	83	No	No	526	85	No	No
1 – 2 PM	373	61	No	No	396	63	No	No
2 – 3 PM	502	82	No	No	530	85	No	No
3 – 4 PM	659	114	No	No	692	118	No	No
4 – 5 PM	609	89	No	No	653	94	No	No
5 – 6 PM	647	88	No	No	701	94	No	No
		Warranted?	No			Warranted?	No	

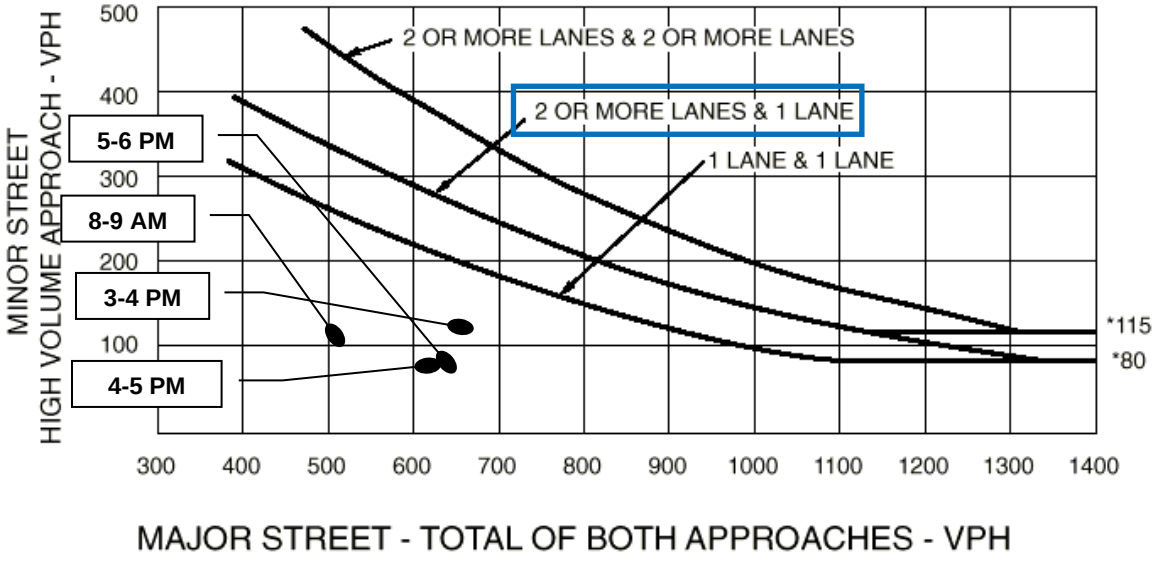
Time	#2 Devils Glen Road & Central Avenue							
	Projected 2033 No Build Conditions				Projected 2033 Buildout Conditions			
	Major Roadway	Minor Roadway	Warrant 1 Met?		Major Roadway	Minor Roadway	Warrant 1 Met?	
	Devils Glen Road	Central Avenue (Highest Volume Leg)	Condition A	Condition B	Devils Glen Road	Central Avenue (Highest Volume Leg)	Condition A	Condition B
6 – 7 AM	191	63	No	No	213	64	No	No
7 – 8 AM	303	94	No	No	333	95	No	No
8 – 9 AM	333	113	No	No	367	115	No	No
9 – 10 AM	207	62	No	No	230	64	No	No
10 – 11 AM	215	77	No	No	235	78	No	No
11 – 12 AM	281	77	No	No	305	79	No	No
12 – 1 PM	333	92	No	No	357	94	No	No
1 – 2 PM	248	67	No	No	271	69	No	No
2 – 3 PM	333	91	No	No	361	94	No	No
3 – 4 PM	438	125	No	No	471	129	No	No
4 – 5 PM	405	99	No	No	449	104	No	No
5 – 6 PM	430	97	No	No	484	103	No	No
		Warranted?	No			Warranted?	No	

Traffic Signal Warrant 2 – Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant condition is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant is satisfied when the plotted points representing vehicles per hour on the major street (total of both approaches) and corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in the following figures. On the minor street the higher volume is not required to be on the same approach during each of the four hours. For the purposes of this analysis the highest hourly volume sets were chosen.

The following figures present the traffic volume data used to determine if Warrant 2 – Four Hour Vehicular Volume is met under projected 2023 and 2033 conditions. The applicable threshold curves are identified in the figures below by a blue rectangle. Instances of hourly volumes meeting the warrant are identified in green.

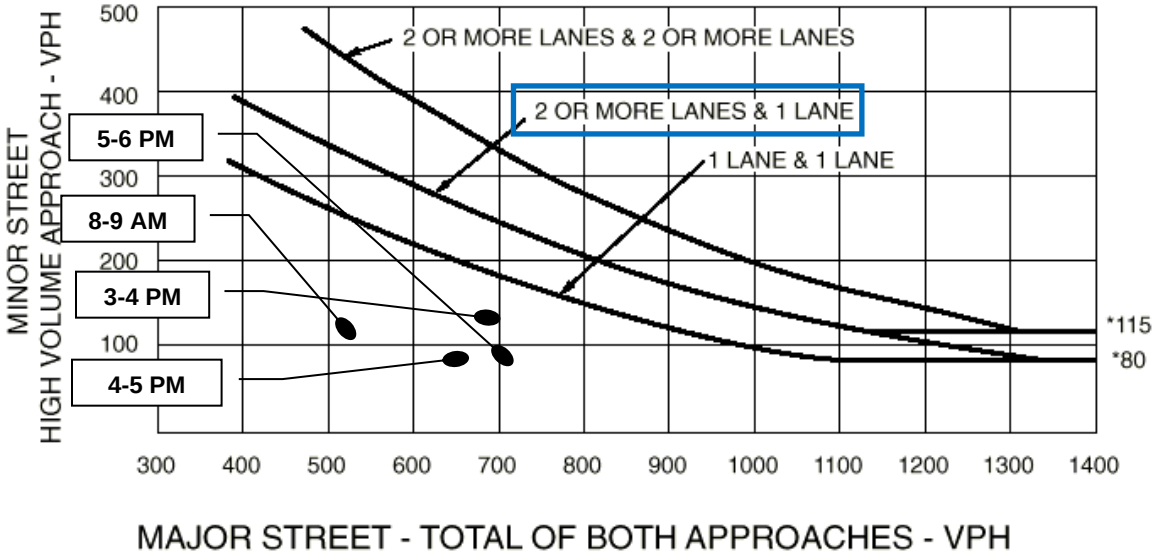
Figure 9 Four Hour Vehicular Volume Warrant – Projected 2023 No Build Study Intersection #2



*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009, page 440.

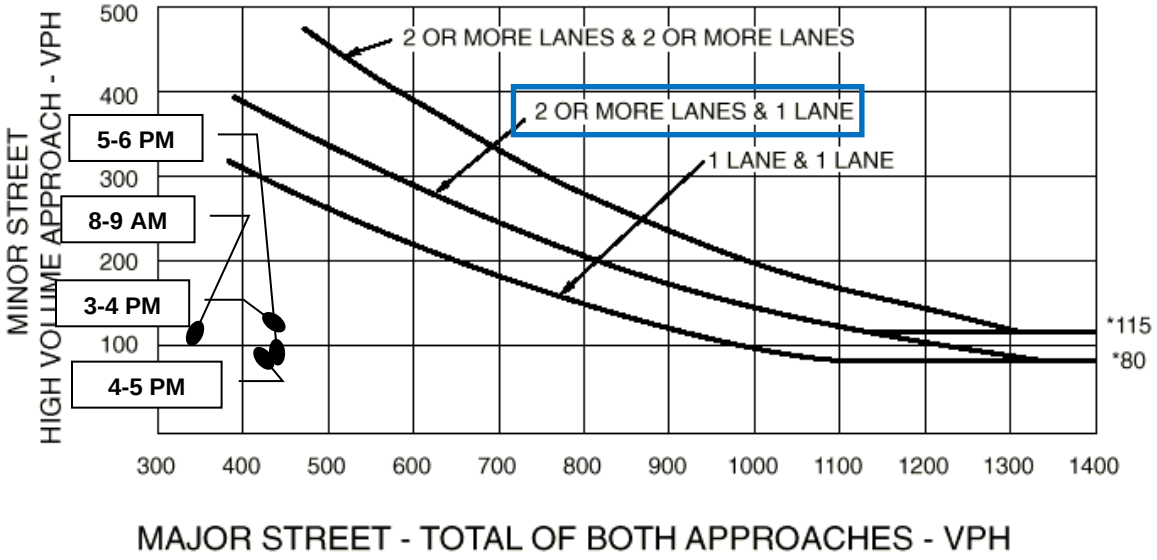
Figure 10 **Four Hour Vehicular Volume Warrant – Projected 2023 Buildout Study Intersection #2**



*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009, page 440.

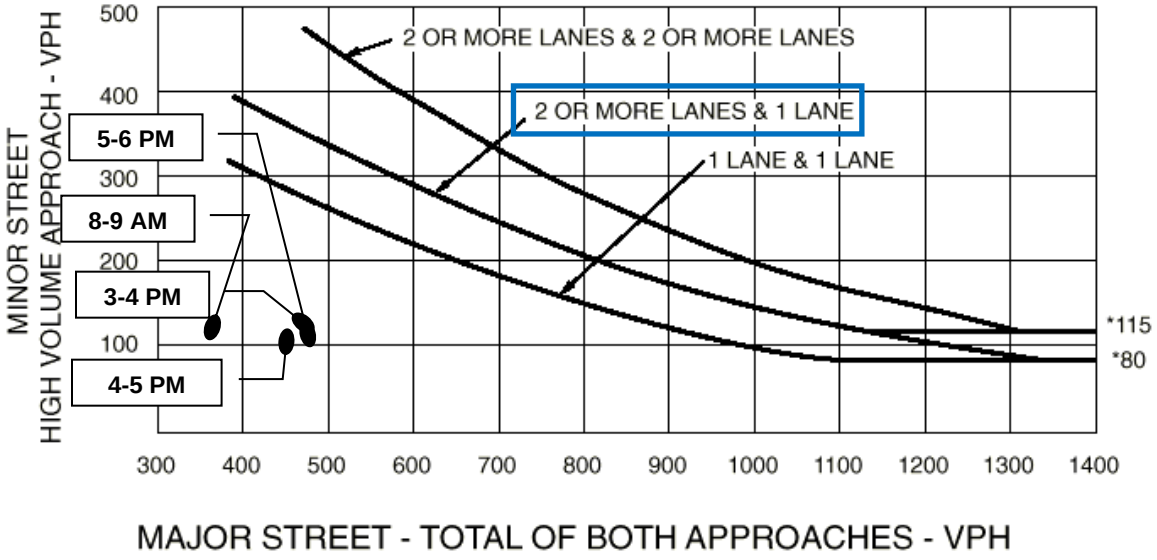
Figure 11 **Four Hour Vehicular Volume Warrant – Projected 2033 No Build Study Intersection #2**



*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009, page 440.

Figure 12 Four Hour Vehicular Volume Warrant – Projected 2033 Buildout Study Intersection #2



*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009, page 440.

The following table provides a summary of the traffic signal warrants under projected 2023 and 2033 conditions at study intersection #2. Green highlighted cells in the following tables indicates if a traffic signal warrant was met.

Table 14 Signal Warrant Analysis Summary

Study Intersection		Condition	Warrant 1		Warrant 2
			8 Hour Required		4 Hour Required
			A	B	
2	Devils Glen Road & Central Avenue	Projected 2023 No Build	0 Hours Met	0 Hours Met	0 Hours Met
		Projected 2023 Buildout	0 Hours Met	0 Hours Met	0 Hours Met
		Projected 2033 No Build	0 Hours Met	0 Hours Met	0 Hours Met
		Projected 2033 Buildout	0 Hours Met	0 Hours Met	0 Hours Met

Based on the analysis presented herein study intersection #2 does not meet any traffic signal warrant. Traffic signal warrants for study intersection #1 (access point) were not conducted due to relatively low turning movement volumes.

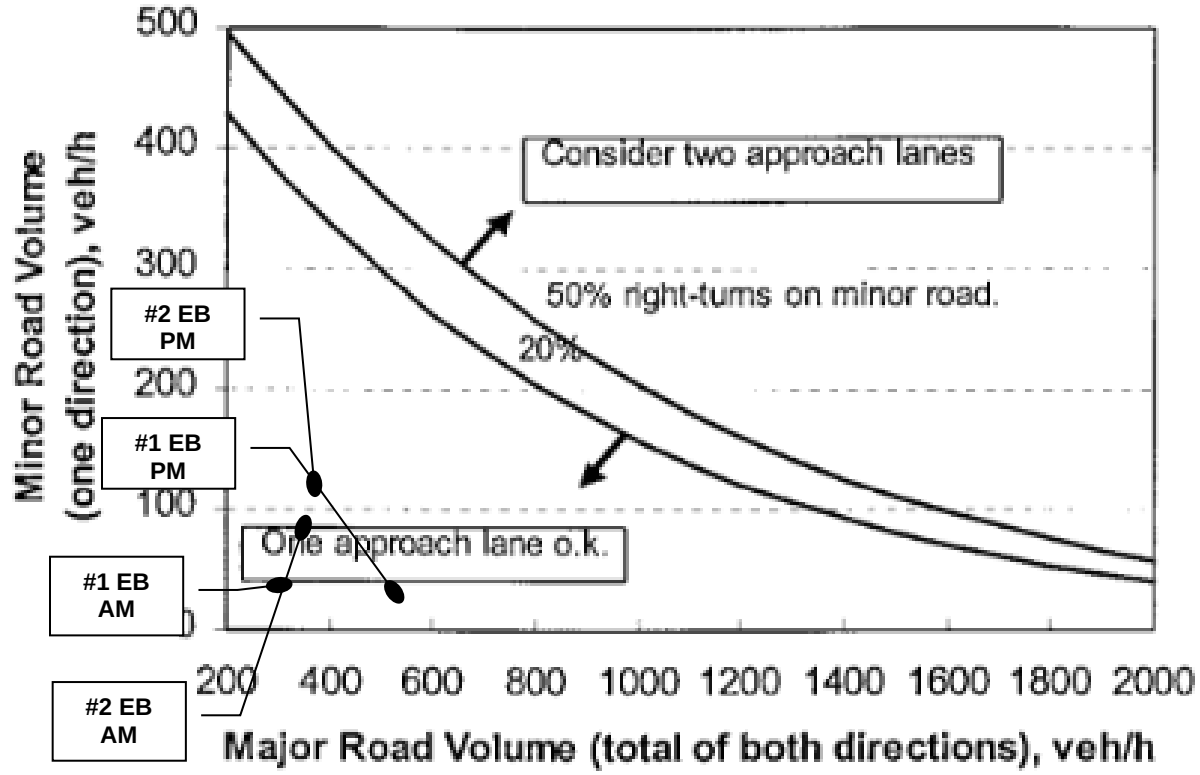
Turn-Bay Warrant Analysis

The subsequent two-way stop control (TWSC) turn-bay guideline analysis was performed under the guidelines and procedures as outlined in the National Cooperative Highway Research Program (NCHRP) report 457 Evaluating Intersection Improvements: An Engineering Study Guide (2001). The NCHRP 457 discusses vehicle operational and safety benefits of dedicated turn-bays. Dedicated turn bays allow for the removal of left- and or right-turning vehicles from the through lane, which results in reduced vehicle delay. Additionally, intersection crash rates are anticipated to be reduced through the provision of dedicated left- and right-turn bays. The following turn bay guidelines are not applicable at signalized intersections. The operational analysis will be used to determine if additional turn bays are needed at signalized intersections. It should be noted meeting a guideline does not require that a turn-bay be recommended. It should also be noted both Devils Glen Road and Central Avenue are classified as minor arterial roadways. However, for the purposes of the analysis presented herein Devils Glen Road and Central Avenue are considered the major and minor roadways, respectively.

Minor Road Approach Geometry Guideline

The turn-bay analysis presented below focuses on projected 2043 AM and PM peak hour buildout conditions on the minor-road approaches to the TWSC study intersections. The following figure provides thresholds curves for determining minor roadway TWSC approach geometry. A highlighted (in yellow) multileader indicates the guideline was met.

Figure 13 Guideline for Determining Minor-Road Approach Geometry at TWSC Intersections



The table below identifies (highlighted in yellow) whether the study intersection approach crosses the threshold curve identified above and therefore merits consideration of an additional turn bay.

Table 15 Minor-Road Approach Geometry Analysis

Study Intersection		Approach	Peak Hour	Major Road Volume (Total Both Directions)	Minor Road Volume (One Direction)	Crosses Threshold Line?
1	Devils Glen Road & Access Point	Eastbound	AM	340	40	No
			PM	513	25	No
2	Devils Glen Road & Central Avenue	Eastbound	AM	334	96	No
			PM	472	130	No

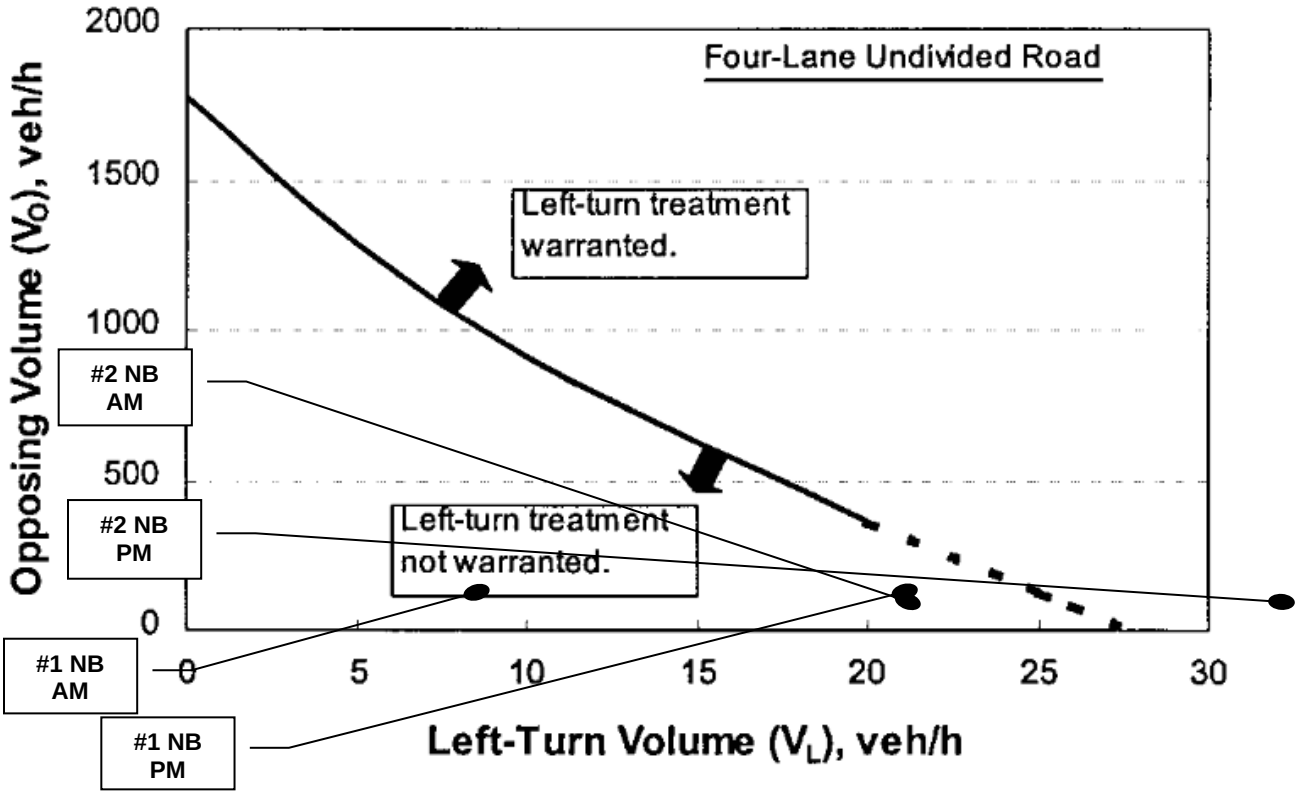
Based on the analysis presented above a single lane approach would be acceptable at all minor roadway TWSC approaches.

Major Road Left-Turn Bay Guideline Two-Lane Roadway

The left-turn bay analysis presented below focuses on projected 2043 AM and PM peak hour buildout conditions on the major-road approaches to the TWSC study intersections on four-lane roadways.

The following figures provides threshold curves for determining the need for a major-road left-turn bay at TWSC study intersections. Advancing volume refers to left-, through- and right-turn volumes. Opposing volume refers to through- and right-turn volumes. A highlighted (in yellow) multileader indicates the guideline was met.

Figure 14 Guideline for Determining the Need for a Major-Road Left-Turn Bay at TWSC Intersections – Four-Lane Roadway



The table below identifies (highlighted in yellow) whether a study intersection approach crosses the threshold curve identified above and therefore meets the guideline for a left-turn bay on a four-lane TWSC major roadway approach. It should be noted unless both the opposing volume (through and right turn volumes) and advancing volume (left, through, and right turn volumes) exceed 400 vehicles per hour a left-turn bay is not warranted

Table 16 Major-Road Left-Turn Guideline Analysis – Four-Lane Roadway

Study Intersection		Approach	Peak Hour	Left-Turn Volume	Opposing Volume	Crosses Threshold Line?
1	Devils Glen Road & Access Point	Northbound	AM	8	186	No
			PM	22	213	No
2	Devils Glen Road & Central Avenue	Northbound	AM	23	203	No
			PM	39 [1]	212	No

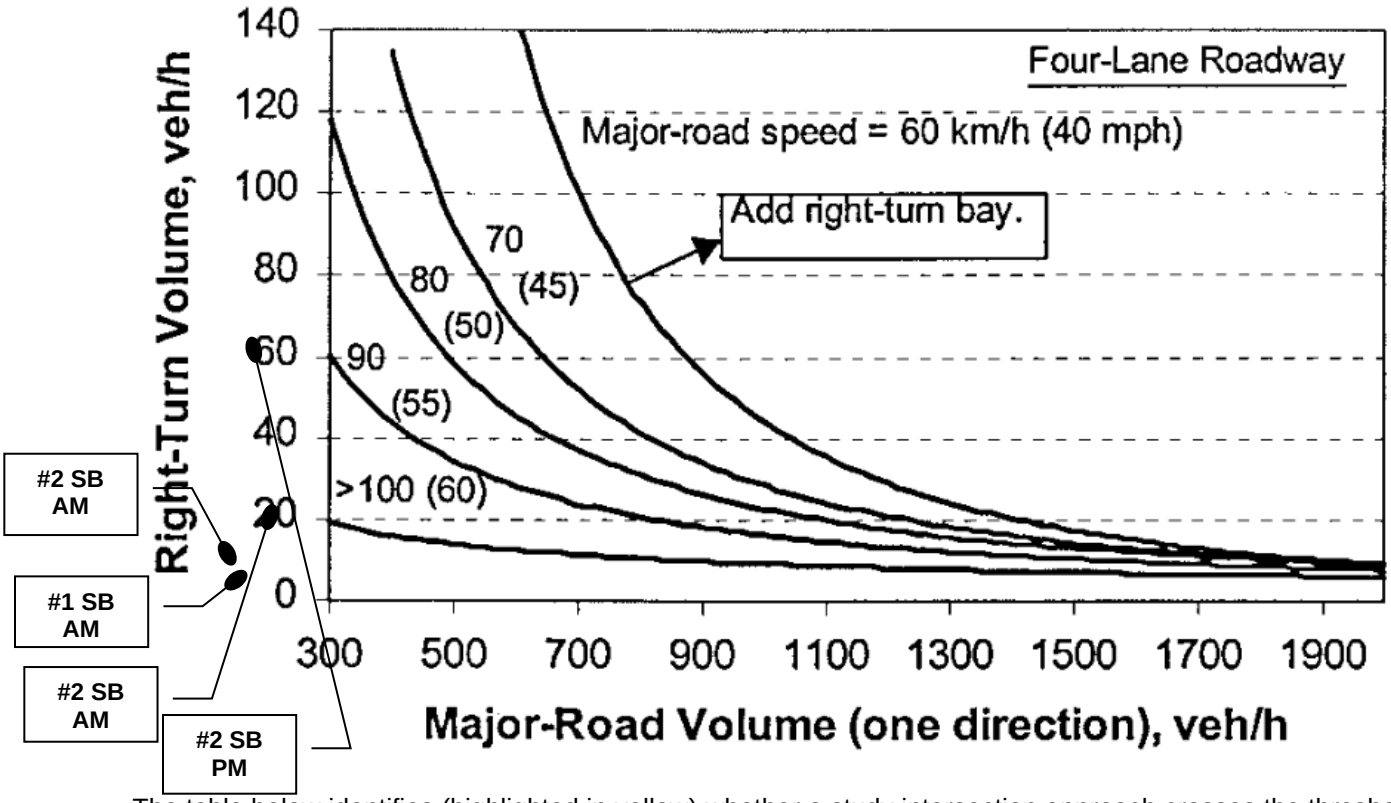
[1] Advancing Volume = 260, therefore the guideline is not met.

Based on the analysis presented above no approach meets the guideline for a dedicated left-turn bay on a four-lane TWSC major roadway approach.

Major Road Right-Turn Bay Guideline Two-Lane Roadway

The right-turn bay warrant analysis presented below focuses on projected 2043 AM and PM peak hour conditions. The following figures provides thresholds curve for determining the need for a major-road right-turn bay at TWSC study intersections on four-lane roadways. A highlighted (in yellow) multileader indicates the guideline was met. It should be noted Devils Glen Road near the study intersections has a posted speed limit of 35 miles per hour (mph).

Figure 15 Guideline for Determining the Need for a Major-Road Right-Turn Bay at TWSC Intersections Two-Lane Roadway



The table below identifies (highlighted in yellow) whether a study intersection approach crosses the threshold curve identified above and therefore meets the guideline for a right-turn bay on a four-lane TWSC major roadway approach.

Table 17 Major-Road Right-Turn Guideline Analysis Two-Lane Roadway

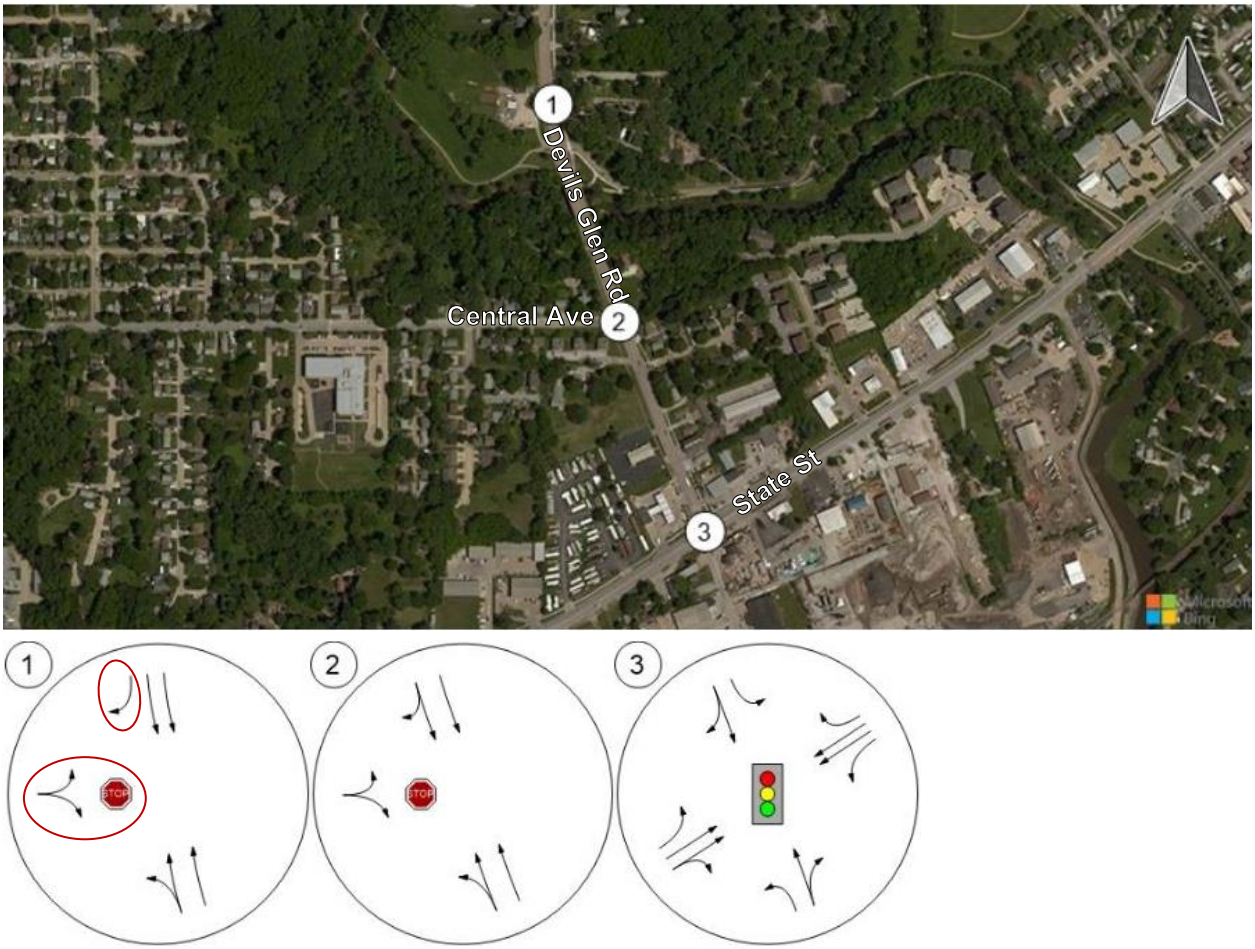
Study Intersection		Approach	Peak Hour	Major Road Volume (One Direction)	Right-Turn Volume	Crosses Threshold Line?
1	Devils Glen Road & Access Point	Southbound	AM	186	6	No
			PM	213	16	No
2	Devils Glen Road & Central Avenue	Southbound	AM	203	23	No
			PM	212	63	No

Based on the analysis presented above no approach meets the guideline for a dedicated right-turn bay on a four-lane TWSC major roadway approach.

Recommended Buildout Lane Configuration & Control

Through a thorough operational analysis (methodology discussed in the Operational Analysis section) recommended lane configuration and control at the study intersections under projected 2043 buildout conditions were identified and are presented in the following figure. Recommended mitigation measures (changes/improvements to the existing lane configuration and control) at the study intersections are delineated in red in the following figure. The analysis presented herein intends to justify the recommended buildout lane configuration and control shown in the figure below.

Figure 16 Study Intersections - Recommended 2043 Buildout Lane Configuration and Control



- The southbound right-turn bay at study intersection #1 is recommended to improve safety

Traffic Modeling & Mitigation

Vehicle Operational Analysis

Vehicular operational analysis for this study was performed using the methodology of the 6th Edition Highway Capacity Manual (HCM) through Vistro traffic analysis software. Operational analysis is generally categorized in terms of Level of Service (LOS). LOS describes the quality of traffic operations and is graded from A to F; with LOS A representing free-flow conditions and LOS F representing congested conditions. Acceptable LOS conditions can generally be defined as average intersection control delay at LOS D or better and with no more than one approach at LOS E or worse. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection and the time for vehicles to speed up through the intersection and enter the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. At two-way stop-controlled (TWSC) intersections the primary LOS measure to consider is the intersection approach with the longest control delay, which as stated above would need to be LOS E or better to generally be deemed acceptable. The primary LOS measure[1] at signalized intersections is average intersection control delay and approach control delay.

A queueing analysis was also performed at the study intersections. A vehicle queue is a line of vehicles waiting to pass through an intersection. As vehicles arrive the queue grows and as the movement is served, the queue length shrinks. To account for this variation, it is standard practice to consider the 95th percentile queue length. The 95th percentile queue is the length of which the queue will be less than 95 percent of the time.

The following table presents the range of traffic delays associated for signalized and unsignalized (TWSC) intersections. It should be noted delay thresholds for a given LOS for TWSC intersections are lower than those given for signalized intersections. This difference, as explained in Chapter 20 of the HCM 6th Edition is to account for the greater variability in delay associated with unsignalized movements in addition to different driver expectations associated with each type of intersection control with the expectation that signalized intersections are designed to carry higher traffic volumes and therefore will experience greater delay than unsignalized intersections.

Table 18 LOS Criteria for Signalized & Unsignalized Intersections

LOS	Signalized Intersection Average Control Delay (sec/veh)	Unsignalized Intersection Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Source: HCM 6th Edition
sec/veh = seconds per vehicle

The following table presents operational conditions at the study intersections under existing and projected no build and buildout AM and PM peak hour conditions. No build and buildout conditions assume the existing lane configuration and control presented in Figure 2. It should be reiterated, at TWSC controlled intersections the primary LOS measure to consider is the intersection approach with the longest delay, which as stated above would need to be LOS E or better to generally be deemed acceptable. Existing signal timings (yellow, all red, and pedestrian timings) were used for the operational analysis. Highlighted yellow cells indicate a LOS issue or a queue extending past its upstream intersection.

[1] Volume to Capacity (V/C) ratio is another measurement used to determine LOS. If the V/C ratio is greater than 1.0 LOS is F regardless of delay. An expanded discussion of v/c ratios is provided in Appendix 3.

Table 19 Existing & Projected Intersection Operations

Study Intersection		Scenario	Metric	AM Peak Hour				PM Peak Hour			
				NB	SB	EB	WB	NB	SB	EB	WB
1	Devils Glen Road & Access Point	Projected 2023 Buildout	Approach Delay	0.3	0.0	10.2	-	0.4	0.0	10.8	-
			Approach LOS	A	A	B	-	A	A	B	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	1		4	-	1		3	-
		Projected 2043 Buildout	Approach Delay	0.4	0.0	9.6	-	0.6	0.0	9.9	-
			Approach LOS	A	A	A	-	A	A	A	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	1		4	-	1		3	-
2	Devils Glen Road & Central Avenue	Existing 2022 No Build	Approach Delay	1.5	0.0	12.0	-	1.3	0.0	15.0	-
			Approach LOS	A	A	B	-	A	A	C	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	3		14	-	5		26	-
		Projected 2023 No Build	Approach Delay	1.5	0.0	11.8	-	1.3	0.0	14.5	-
			Approach LOS	A	A	B	-	A	A	B	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	3		14	-	4		25	-
		Projected 2023 Buildout	Approach Delay	1.5	0.0	12.1	-	1.3	0.0	15.2	-
			Approach LOS	A	A	B	-	A	A	B	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	3		15	-	4		28	-
		Projected 2043 No Build	Approach Delay	1.5	0.0	10.6	-	1.3	0.0	12.0	-
			Approach LOS	A	A	B	-	A	A	C	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	2		13	-	3		21	-
		Projected 2043 Buildout	Approach Delay	1.4	0.0	10.8	-	1.2	0.0	12.4	-
			Approach LOS	A	A	B	-	A	A	B	-
			95th Percentile Queue	LT		LR	-	LT		LR	-
			(Longest Movement) in Feet	2		13	-	3		23	-

Delay and LOS analysis based on HCM 6th Edition Methodology

Table 19 Existing & Projected Intersection Operations Continued

Study Intersection		Scenario	Metric	AM Peak Hour				PM Peak Hour			
				NB	SB	EB	WB	NB	SB	EB	WB
3	Devils Glen Road & State Street	Existing 2022 No Build	Approach Delay	31.8	33.6	8.0	10.9	29.7	32.9	9.2	13.5
			Approach LOS	C	C	A	B	C	C	A	B
			95th Percentile Queue	L	L	T	T	TR	L	T	T
			(Longest Movement) in Feet	3	127	83	152	17	130	99	195
			Intersection Delay & LOS	13.6, B				14.6, B			
		Projected 2023 No Build	Approach Delay	32.1	33.8	7.8	10.6	30.1	33.2	8.9	13.0
			Approach LOS	C	C	A	B	C	C	A	B
			95th Percentile Queue	L	L	T	T	TR	L	T	T
			(Longest Movement) in Feet	3	119	80	150	16	123	95	193
			Intersection Delay & LOS	13.2, B				14.2, B			
		Projected 2023 Buildout	Approach Delay	31.7	33.5	8.1	11.0	29.7	33.0	9.1	13.5
			Approach LOS	C	C	A	B	C	C	A	B
			95th Percentile Queue	L	L	T	T	TR	L	T	T
			(Longest Movement) in Feet	3	128	82	154	16	129	97	197
			Intersection Delay & LOS	13.7, B				14.6, B			
		Projected 2043 No Build	Approach Delay	33.9	32.3	6.3	9.0	33.1	35.5	6.9	10.2
			Approach LOS	C	D	A	A	C	D	A	B
			95th Percentile Queue	L	L	T	T	TR	L	T	T
			(Longest Movement) in Feet	3	79	63	140	10	83	73	173
			Intersection Delay & LOS	10.9, B				11.3, B			
		Projected 2043 Buildout	Approach Delay	33.9	35.5	6.4	9.2	32.4	34.9	7.3	10.9
			Approach LOS	C	D	A	A	C	D	A	B
			95th Percentile Queue	L	L	T	T	TR	L	T	T
			(Longest Movement) in Feet	3	89	65	143	10	88	77	183
			Intersection Delay & LOS	11.3, B				11.9, B			

Delay and LOS analysis based on HCM 6th Edition Methodology

The analysis presented herein indicates all the study intersections will operate at acceptable LOS D or better and with no more than one approach at LOS E or worse during the AM and PM peak hour conditions through 2043 with buildout of the proposed development. This determination assumes the recommended lane configuration and control presented in Figure 16. No other changes/improvements to the study intersections lane configuration and control from what is depicted in Figure 16 are considered necessary as mitigation for the proposed development. The 95th percentile queues at the study intersections were also analyzed and no issues, such as a queue extending upstream to an adjacent intersection are anticipated. Operational analysis worksheets are contained in Appendix 3.

Findings & Recommendations

David Kempen, CCIM initiated this traffic impact study to identify potential traffic impacts on the adjacent roadway network and provide traffic mitigation measures, if necessary, due to their proposed residential development. The proposed development consists of four three story apartment buildings containing 114 dwelling units, as well as 12 townhouses totaling 126 residential dwelling units. The sole access point will be located at 1200 Devils Glenn Road, which is north of Central Avenue, west of Devils Glen Road, and east of Duck Creek Trail Parkway. The access point is anticipated to be a full access point with no turning movement restrictions. Sight visibility zones corresponding to intersection sight distance calculations as defined through AASHTO should be identified and maintained at this access point. These zones should not contain structures or plantings that would preclude unobstructed views of oncoming traffic. Current designs for the development do not indicate obstructions within the sight visibility zones. Opening and design analysis years are assumed to be 2023 and 2043, respectively.

IDOT Bureau of Data Collection provided intersection related crash data at the study intersection for the ten-year period between January 1, 2011 and December 31, 2020. Over this period a total of 56 crashes were reported at the study intersections. It should be noted study intersections #1 is not an existing intersection and therefore does not have a crash history. This intersection will become the sole access point and be constructed in conjunction with the proposed development.

Traffic Signal Warrant 1 – Eight Hour Vehicular Volume and Traffic Signal Warrant 2 – Four-Hour Vehicular Volume were analyzed herein. Based on this analysis neither signal warrant was met.

A two-way stop control (TWSC) turn-bay guideline analysis was performed on study intersections #1 and #2. Based on this analysis no approach meets the TWSC guideline for a dedicated turn bay

The analysis presented herein indicates all the study intersections will operate at acceptable LOS D or better and with no more than one approach at LOS E or worse during the AM and PM peak hour conditions through 2043 with buildout of the proposed development. This determination assumes the recommended lane configuration and control presented in Figure 16. No other changes/improvements to the study intersections lane configuration and control from what is depicted in Figure 16 are considered necessary as mitigation for the proposed development. It should be noted the southbound right-turn bay at study intersection #1 is recommended to improve safety. The 95th percentile queues at the study intersections were also analyzed and no issues, such as a queue extending upstream to an adjacent intersection are anticipated. Operational analysis worksheets are contained in Appendix 3.

Appendix 1

Background Traffic Counts (Raw Data)

(2) Devils Glen Road & Central Avenue - All Vehicles

15-min Interval	From North (Southbound) Devils Glen Road			From East (Westbound) NA			From South (Northbound) Devils Glen Road			From West (Eastbound) Central Avenue			Int Count	Peak Hour
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
6:00 - 6:15		36	2				6	34		1		7	86	360
6:15 - 6:30		48	1				6	12		5		9	81	399
6:30 - 6:45		53	6				2	10		6		13	90	442
6:45 - 7:00		65	4				2	17		7		8	103	505
7:00 - 7:15		46	6				9	46		8		10	125	568
7:15 - 7:30		62	9				9	30		8		6	124	616
7:30 - 7:45		78	8				11	36		8		12	153	692
7:45 - 8:00		71	7				7	49		16		16	166	673
8:00 - 8:15		64	14				9	59		16		11	173	633
8:15 - 8:30		95	16				11	46		20		12	200	552
8:30 - 8:45		62	11				4	36		13		8	134	457
8:45 - 9:00		49	11				6	39		15		6	126	413
9:00 - 9:15		29	13				3	37		6		4	92	385
9:15 - 9:30		31	4				7	47		8		8	105	388
9:30 - 9:45		33	6				5	33		7		6	90	378
9:45 - 10:00		40	12				2	28		7		9	98	397
10:00 - 10:15		28	5				8	38		14		2	95	412
10:15 - 10:30		32	6				8	29		12		8	95	426
10:30 - 10:45		38	8				3	43		10		7	109	469
10:45 - 11:00		27	10				10	50		11		5	113	491
11:00 - 11:15		45	10				6	35		8		5	109	517
11:15 - 11:30		43	14				3	59		13		6	138	571
11:30 - 11:45		39	15				4	53		13		7	131	576
11:45 - 12:00		57	8				2	55		10		7	139	608
12:00 - 12:15		53	16				7	65		15		7	163	614
12:15 - 12:30		56	16				4	52		8		7	143	582
12:30 - 12:45		50	18				7	69		8		11	163	561
12:45 - 1:00		58	17				2	42		18		8	145	507
1:00 - 1:15		53	10				8	48		6		6	131	456
1:15 - 1:30		42	8				5	49		12		6	122	473
1:30 - 1:45		40	14				5	37		10		3	109	497
1:45 - 2:00		34	3				8	32		10		7	94	549
2:00 - 2:15		45	13				8	63		9		10	148	613
2:15 - 2:30		48	8				8	66		4		12	146	687
2:30 - 2:45		48	16				9	60		18		10	161	703
2:45 - 3:00		47	13				7	73		8		10	158	774
3:00 - 3:15		54	26				33	85		15		9	222	811
3:15 - 3:30		41	21				14	63		11		12	162	798
3:30 - 3:45		71	27				8	89		23		14	232	811
3:45 - 4:00		52	23				6	86		18		10	195	738
4:00 - 4:15		47	13				22	92		23		12	209	734
4:15 - 4:30		67	23				1	68		10		6	175	742
4:30 - 4:45		41	15				12	70		14		7	159	785
4:45 - 5:00		56	23				6	90		12		4	191	794
5:00 - 5:15		68	20				13	98		9		9	217	773
5:15 - 5:30		55	21				13	107		9		13	218	
5:30 - 5:45		49	16				8	74		9		12	168	
5:45 - 6:00		55	13				5	71		18		8	170	

AM Intersection Peak Hour Factor (PHF) = 0.87

PM Intersection Peak Hour Factor (PHF) = 0.87

* Counts collected on Tuesday, Marchy 22, 2022.

Background Traffic Counts (Raw Data)

(2) Devils Glen Road & Central Avenue - Light Vehicles Only

15-min	From North (Southbound)			From East (Westbound)			From South (Northbound)			From West (Eastbound)			Int	Peak
	Devils Glen Road			NA			Devils Glen Road			Central Avenue			Count	Hour
Interval	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
6:00 - 6:15		36	2				6	34		1		7	86	356
6:15 - 6:30		48	1				6	12		5		9	81	389
6:30 - 6:45		52	5				2	10		6		13	88	427
6:45 - 7:00		64	4				2	17		6		8	101	488
7:00 - 7:15		45	5				8	44		7		10	119	547
7:15 - 7:30		61	9				7	28		8		6	119	597
7:30 - 7:45		76	7				11	36		8		11	149	671
7:45 - 8:00		71	7				7	45		14		16	160	648
8:00 - 8:15		63	12				9	58		16		11	169	608
8:15 - 8:30		94	16				11	42		19		11	193	530
8:30 - 8:45		60	10				3	33		12		8	126	438
8:45 - 9:00		49	11				5	36		13		6	120	395
9:00 - 9:15		29	13				3	36		6		4	91	368
9:15 - 9:30		29	4				7	46		8		7	101	369
9:30 - 9:45		31	5				5	30		6		6	83	360
9:45 - 10:00		38	12				2	27		5		9	93	381
10:00 - 10:15		27	5				8	36		14		2	92	396
10:15 - 10:30		30	6				7	29		12		8	92	411
10:30 - 10:45		35	6				3	43		10		7	104	455
10:45 - 11:00		27	10				9	48		9		5	108	478
11:00 - 11:15		43	10				6	35		8		5	107	506
11:15 - 11:30		43	14				3	57		13		6	136	557
11:30 - 11:45		38	14				4	52		12		7	127	558
11:45 - 12:00		55	8				2	55		9		7	136	585
12:00 - 12:15		52	15				7	63		14		7	158	589
12:15 - 12:30		52	16				4	50		8		7	137	557
12:30 - 12:45		46	17				5	67		8		11	154	540
12:45 - 1:00		56	16				2	42		17		7	140	489
1:00 - 1:15		52	10				8	45		6		5	126	440
1:15 - 1:30		41	8				5	48		12		6	120	457
1:30 - 1:45		39	12				5	34		10		3	103	481
1:45 - 2:00		33	3				8	32		9		6	91	533
2:00 - 2:15		43	13				8	60		9		10	143	596
2:15 - 2:30		47	8				8	65		4		12	144	672
2:30 - 2:45		44	15				9	59		18		10	155	689
2:45 - 3:00		47	13				7	70		7		10	154	759
3:00 - 3:15		53	26				33	85		15		7	219	795
3:15 - 3:30		41	21				14	62		11		12	161	782
3:30 - 3:45		69	25				8	88		22		13	225	796
3:45 - 4:00		50	22				6	85		17		10	190	729
4:00 - 4:15		47	13				21	91		23		11	206	728
4:15 - 4:30		67	23				1	68		10		6	175	739
4:30 - 4:45		41	14				12	70		14		7	158	781
4:45 - 5:00		56	23				6	89		11		4	189	790
5:00 - 5:15		68	20				13	98		9		9	217	770
5:15 - 5:30		54	21				13	107		9		13	217	
5:30 - 5:45		49	15				8	74		9		12	167	
5:45 - 6:00		55	13				5	71		17		8	169	

* Counts collected on Tuesday, Marchy 22, 2022.

Background Traffic Counts (Raw Data)

(3) Devils Glen Road & State Street - All Vehicles

15-min Interval	From North (Southbound) Devils Glen Road			From East (Westbound) State Street			From South (Northbound) Devils Glen Road			From West (Eastbound) State Street			Int Count	Peak Hour
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
6:00 - 6:15	24	2	17	0	191	43	0	0	0	7	74	1	359	1,440
6:15 - 6:30	37	1	18	1	101	12	1	0	1	4	141	3	320	1,503
6:30 - 6:45	53	0	19	0	97	10	2	0	2	3	175	1	362	1,526
6:45 - 7:00	40	3	36	0	113	11	4	0	0	7	182	3	399	1,556
7:00 - 7:15	23	0	22	3	211	41	2	0	1	13	102	4	422	1,602
7:15 - 7:30	34	0	35	3	127	30	0	0	0	14	98	2	343	1,543
7:30 - 7:45	40	0	48	0	155	27	1	1	1	16	100	3	392	1,542
7:45 - 8:00	36	2	41	2	169	30	1	0	1	22	135	6	445	1,468
8:00 - 8:15	26	3	42	0	123	31	1	3	1	33	95	5	363	1,310
8:15 - 8:30	40	1	53	1	99	30	2	0	1	30	83	2	342	
8:30 - 8:45	35	1	42	2	124	18	3	0	2	19	71	1	318	
8:45 - 9:00	29	0	29	0	98	28	3	0	2	21	76	1	287	

3:00 - 3:15	27	2	28	3	250	66	1	9	0	40	101	2	529	1,823
3:15 - 3:30	21	2	24	3	141	46	1	2	1	29	104	1	375	1,777
3:30 - 3:45	48	4	38	3	197	33	6	2	4	55	128	2	520	1,761
3:45 - 4:00	35	0	22	1	110	33	6	1	3	57	131	0	399	1,643
4:00 - 4:15	24	1	27	2	197	46	9	3	5	62	106	1	483	1,633
4:15 - 4:30	33	5	37	0	105	15	4	4	0	53	103	0	359	1,578
4:30 - 4:45	25	1	22	0	123	32	10	4	0	46	136	3	402	1,660
4:45 - 5:00	34	0	23	0	89	33	2	1	2	66	137	2	389	1,642
5:00 - 5:15	36	3	34	3	113	36	7	1	0	65	128	2	428	1,592
5:15 - 5:30	35	0	34	0	103	50	3	1	1	64	148	2	441	
5:30 - 5:45	40	3	24	2	103	26	3	2	1	49	127	4	384	
5:45 - 6:00	28	2	29	2	84	24	6	4	1	49	105	5	339	

AM Intersection Peak Hour Factor (PHF) = 0.90

PM Intersection Peak Hour Factor (PHF) = 0.86

* Counts collected on Tuesday, Marchy 22, 2022.

Background Traffic Counts (Raw Data)

(3) Devils Glen Road & State Street - Light Vehicles Only

15-min Interval	From North (Southbound) Devils Glen Road			From East (Westbound) State Street			From South (Northbound) Devils Glen Road			From West (Eastbound) State Street			Int Count	Peak Hour
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
6:00 - 6:15	24	2	17	0	190	43	0	0	0	7	72	1	356	1,381
6:15 - 6:30	37	1	18	1	97	12	0	0	0	4	133	3	306	1,427
6:30 - 6:45	52	0	18	0	93	10	1	0	0	3	167	1	345	1,445
6:45 - 7:00	40	3	35	0	100	11	2	0	0	7	173	3	374	1,476
7:00 - 7:15	22	0	22	3	204	39	2	0	1	12	93	4	402	1,516
7:15 - 7:30	34	0	34	2	118	27	0	0	0	13	94	2	324	1,453
7:30 - 7:45	38	0	47	0	152	27	0	1	1	15	94	1	376	1,449
7:45 - 8:00	35	2	40	2	155	27	1	0	1	22	124	5	414	1,360
8:00 - 8:15	25	3	42	0	111	30	1	3	0	32	89	3	339	1,201
8:15 - 8:30	40	0	53	1	93	30	1	0	1	27	73	1	320	
8:30 - 8:45	34	1	41	2	110	15	1	0	2	19	61	1	287	
8:45 - 9:00	29	0	28	0	87	26	2	0	2	18	62	1	255	
3:00 - 3:15	27	2	26	2	241	66	1	8	0	40	93	1	507	1,744
3:15 - 3:30	21	2	24	2	133	45	1	2	1	29	93	1	354	1,704
3:30 - 3:45	47	4	36	2	190	33	6	2	4	54	122	1	501	1,698
3:45 - 4:00	34	0	21	1	102	32	6	1	3	57	125	0	382	1,591
4:00 - 4:15	23	1	27	2	189	45	9	3	5	61	101	1	467	1,591
4:15 - 4:30	33	5	37	0	100	15	4	4	0	53	97	0	348	1,541
4:30 - 4:45	25	1	22	0	120	32	10	4	0	46	131	3	394	1,629
4:45 - 5:00	34	0	23	0	86	33	2	1	2	64	135	2	382	1,613
5:00 - 5:15	36	3	34	2	110	36	7	1	0	65	121	2	417	1,568
5:15 - 5:30	35	0	33	0	101	50	3	1	1	64	146	2	436	
5:30 - 5:45	40	3	24	2	99	26	3	2	1	49	125	4	378	
5:45 - 6:00	28	2	29	2	82	24	6	4	1	49	105	5	337	

* Counts collected on Tuesday, Marchy 22, 2022.

Peak Hour Turning Movement Volumes

(2) Devils Glen Road & Central Avenue - All Vehicles

15-min Interval	From North (Southbound) Devils Glen Road			From East (Westbound) NA			From South (Northbound) Devils Glen Road			From West (Eastbound) Central Avenue			Intersection Count
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
7:00 - 7:15		46	6				9	46		8		10	125
7:15 - 7:30		62	9				9	30		8		6	124
7:30 - 7:45		78	8				11	36		8		12	153
7:45 - 8:00		71	7				7	49		16		16	166
2022 Volumes	**0**	**257**	**30**	**0**	**0**	**0**	**36**	**161**	**0**	**40**	**0**	**44**	**568**
Growth Factor From 2022	0.9428	0.9428	0.9428				0.9428	0.9428	0.9428	1.0143	1.0143	1.0143	-
2023 Volumes	**0**	**242**	**28**	**0**	**0**	**0**	**34**	**152**	**0**	**41**	**0**	**45**	**542**
Growth Factor From 2023	0.6648	0.6648	0.6648				0.6648	0.6648	0.6648	1.1046	1.1046	1.1046	-
2033 Volumes	**0**	**161**	**19**	**0**	**0**	**0**	**23**	**101**	**0**	**45**	**0**	**50**	**399**
Growth Factor From 2033	1.0000	1.0000	1.0000				1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	-
2043 Volumes	**0**	**161**	**19**	**0**	**0**	**0**	**23**	**101**	**0**	**45**	**0**	**50**	**399**
Percent Heavy Vehicle	#DIV/0!	2%	7%	#DIV/0!	#DIV/0!	#DIV/0!	8%	5%	#DIV/0!	8%	#DIV/0!	2%	-
												PHF =	0.86

3:00 - 3:15		54	26				33	85		15		9	222
3:15 - 3:30		41	21				14	63		11		12	162
3:30 - 3:45		71	27				8	89		23		14	232
3:45 - 4:00		52	23				6	86		18		10	195
2022 Volumes	**0**	**218**	**97**	**0**	**0**	**0**	**61**	**323**	**0**	**67**	**0**	**45**	**811**
Growth Factor From 2022	0.9428	0.9428	0.9428				0.9428	0.9428	0.9428	1.0143	1.0143	1.0143	-
2023 Volumes	**0**	**206**	**91**	**0**	**0**	**0**	**58**	**305**	**0**	**68**	**0**	**46**	**774**
Growth Factor From 2023	0.6648	0.6648	0.6648				0.6648	0.6648	0.6648	1.1046	1.1046	1.1046	-
2033 Volumes	**0**	**137**	**60**	**0**	**0**	**0**	**39**	**203**	**0**	**75**	**0**	**51**	**565**
Growth Factor From 2033	1.0000	1.0000	1.0000				1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	-
2043 Volumes	**0**	**137**	**60**	**0**	**0**	**0**	**39**	**203**	**0**	**75**	**0**	**51**	**565**
Percent Heavy Vehicle	#DIV/0!	2%	3%	#DIV/0!	#DIV/0!	#DIV/0!	0%	1%	#DIV/0!	3%	#DIV/0!	7%	-
												PHF =	0.87

(3) Devils Glen Road & State Street - All Vehicles

15-min Interval	From North (Southbound) Devils Glen Road			From East (Westbound) State Street			From South (Northbound) Devils Glen Road			From West (Eastbound) State Street			Intersection Count
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
7:00 - 7:15	23	0	22	3	211	41	2	0	1	13	102	4	422
7:15 - 7:30	34	0	35	3	127	30	0	0	0	14	98	2	343
7:30 - 7:45	40	0	48	0	155	27	1	1	1	16	100	3	392
7:45 - 8:00	36	2	41	2	169	30	1	0	1	22	135	6	445
2022 Volumes	**133**	**2**	**146**	**8**	**662**	**128**	**4**	**1**	**3**	**65**	**435**	**15**	**1,602**
Growth Factor From 2022	0.9428	0.9428	0.9428	1.0067	1.0067	1.0067	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	-
2023 Volumes	**125**	**2**	**138**	**8**	**666**	**129**	**4**	**1**	**3**	**64**	**431**	**15**	**1,586**
Growth Factor From 2023	0.6648	0.6648	0.6648	1.0522	1.0522	1.0522	0.6648	0.6648	0.6648	0.9388	0.9388	0.9388	-
2033 Volumes	**83**	**1**	**92**	**8**	**701**	**136**	**3**	**1**	**2**	**60**	**405**	**14**	**1,506**
Growth Factor From 2033	1.0000	1.0000	1.0000	1.0131	1.0131	1.0131	1.0000	1.0000	1.0000	1.0111	1.0111	1.0111	-
2043 Volumes	**83**	**1**	**92**	**8**	**710**	**138**	**3**	**1**	**2**	**61**	**409**	**14**	**1,522**
Percent Heavy Vehicle	3%	0%	2%	13%	5%	6%	25%	0%	0%	5%	7%	20%	-
												PHF =	0.90

3:00 - 3:15	27	2	28	3	250	66	1	9	0	40	101	2	529
3:15 - 3:30	21	2	24	3	141	46	1	2	1	29	104	1	375
3:30 - 3:45	48	4	38	3	197	33	6	2	4	55	128	2	520
3:45 - 4:00	35	0	22	1	110	33	6	1	3	57	131	0	399
2022 Volumes	**131**	**8**	**112**	**10**	**698**	**178**	**14**	**14**	**8**	**181**	**464**	**5**	**1,823**
Growth Factor From 2022	0.9428	0.9428	0.9428	1.0067	1.0067	1.0067	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	-
2023 Volumes	**124**	**8**	**106**	**10**	**703**	**179**	**13**	**13**	**8**	**179**	**460**	**5**	**1,808**
Growth Factor From 2023	0.6648	0.6648	0.6648	1.0522	1.0522	1.0522	0.6648	0.6648	0.6648	0.9388	0.9388	0.9388	-
2033 Volumes	**82**	**5**	**70**	**11**	**740**	**188**	**9**	**9**	**5**	**168**	**432**	**5**	**1,724**
Growth Factor From 2033	1.0000	1.0000	1.0000	1.0131	1.0131	1.0131	1.0000	1.0000	1.0000	1.0111	1.0111	1.0111	-
2043 Volumes	**82**	**5**	**70**	**11**	**750**	**190**	**9**	**9**	**5**	**170**	**437**	**5**	**1,743**
Percent Heavy Vehicle	2%	0%	4%	30%	5%	1%	0%	7%	0%	1%	7%	40%	-
												PHF =	0.86

Appendix 2

#1 Devils Glen Road & Central Avenue

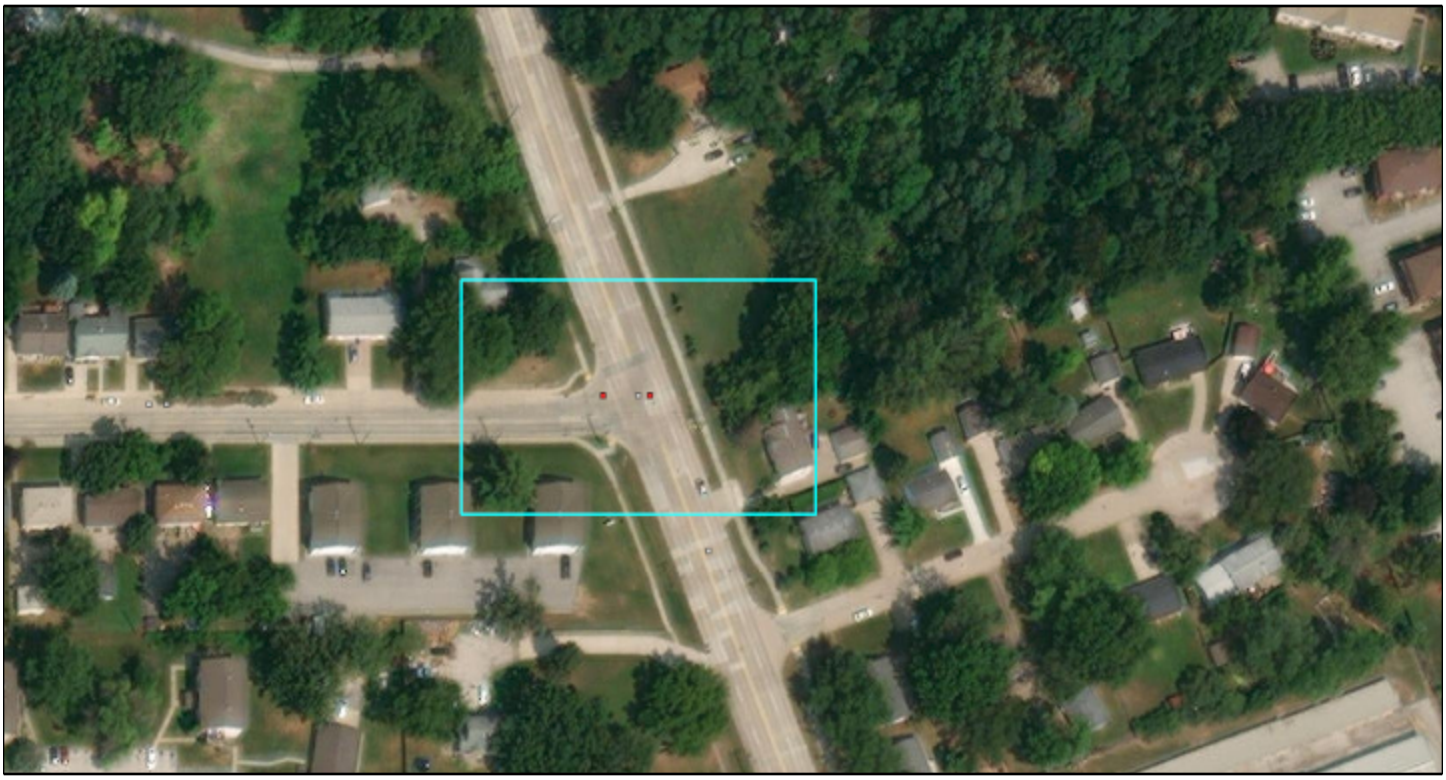
Iowa Crash Analysis Tool
Quick Report
2012-2021

Crash Severity	16
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	3
Possible/Unknown Injury Crash	3
Property Damage Only	10

Injury Status Summary	9
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	4
Possible (complaint of pain/injury)	5
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	84,500.00
Average (per crash dollars):	5,281.25
Total Vehicles:	33.00
Average (per crash):	2.06
Total Occupants:	57.00
Average (per crash):	3.56

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.56
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.25
Possible/Unknown Injuries/Crash:	0.31



Major Cause			15
Animal	0	Ran traffic signal	0
Ran stop sign	2	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	4	FTYROW: From yield sign	0
FTYROW: Making left turn	2	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	1
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	0	Made improper turn	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	1	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	0
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	2
Unknown	1	Not reported	0
Other: No improper action	0		

Time of Day/Day of Week

Day of Week	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reported	Total
Sunday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Monday	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Tuesday	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Wednesday	0	0	0	0	1	0	0	1	1	1	0	0	0	4
Thursday	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Friday	0	0	0	0	0	1	1	2	0	0	0	0	0	4
Saturday	0	0	0	0	0	1	0	0	1	0	0	0	0	2
Total	0	0	0	1	2	2	1	6	3	1	0	0	0	16

Manner of Crash Collision	16
Non-collision (single vehicle)	0
Head-on (front to front)	0
Rear-end (front to rear)	5
Angle, oncoming left turn	1
Broadside (front to side)	8
Sideswipe, same direction	1
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	1
Unknown	0

Surface Conditions	16
Dry	10
Wet	4
Ice/frost	0
Snow	2
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			33
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	Guardrail - end	0
Concrete traffic barrier (median or right sid...	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	0	Traffic sign support	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	33

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	**Total**
< 14	0	0	0	0	0
= 14	0	0	0	0	0
= 15	0	0	0	0	0
= 16	2	0	0	0	2
= 17	0	1	0	0	1
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	1	0	0	1
>= 30 and <= 34	1	2	0	0	3
>= 35 and <= 39	1	1	1	0	3
>= 40 and <= 44	4	1	0	0	5
>= 45 and <= 49	0	2	0	0	2
>= 50 and <= 54	1	3	0	0	4
>= 55 and <= 59	2	4	0	0	6
>= 60 and <= 64	1	0	0	0	1
>= 65 and <= 69	1	2	0	0	3
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	1	0	0	1
>= 80 and <= 84	0	0	0	0	0
>= 85 and <= 89	0	1	0	0	1
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	13	19	1	0	33

Drug/Alcohol Related	**16**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug and Alcohol (< Statutory)	0
Drug and Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	16

Alcohol Test Given	**33**
None	31
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	2

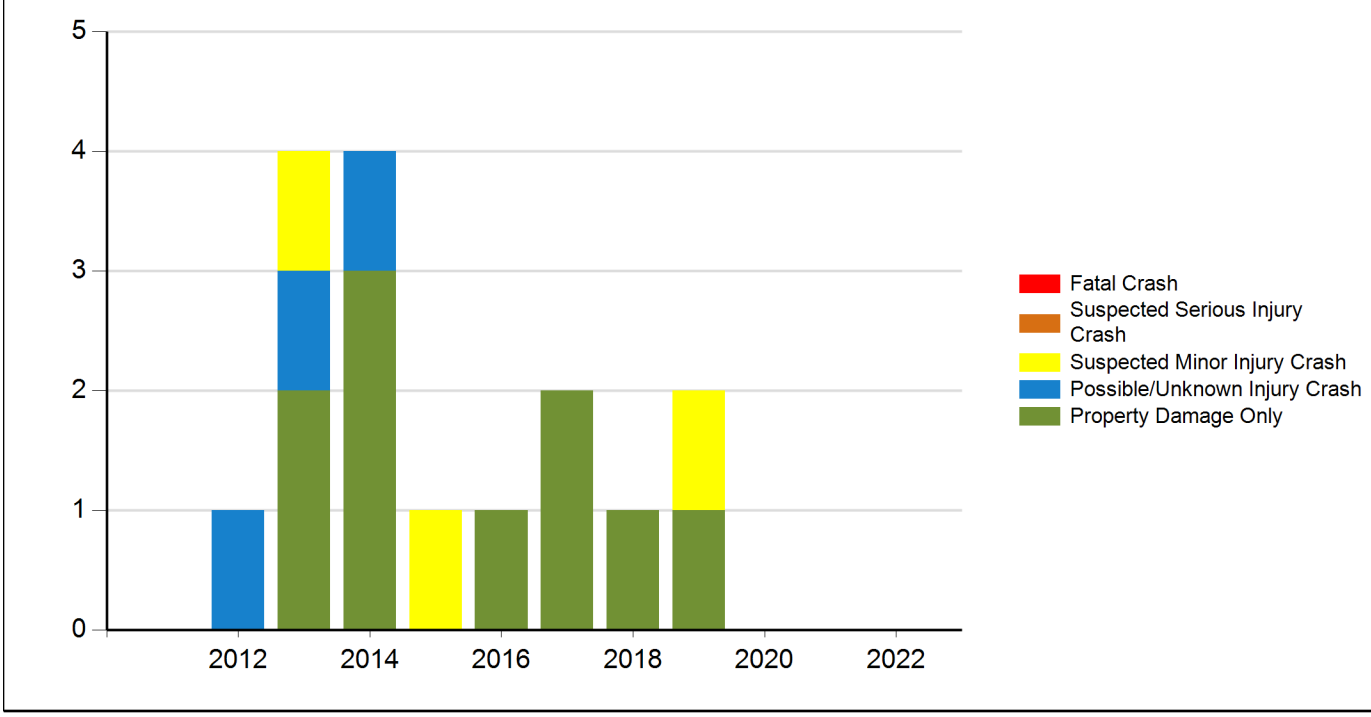
Drug Test Given	**33**
None	31
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	2

Drug Test Result	**21**
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	21
Other	0

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2011	0	0	0	0	0	0
2012	0	0	0	1	0	1
2013	0	0	1	1	2	4
2014	0	0	0	1	3	4
2015	0	0	1	0	0	1
2016	0	0	0	0	1	1
2017	0	0	0	0	2	2
2018	0	0	0	0	1	1
2019	0	0	1	0	1	2
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
Total	0	0	3	3	10	16

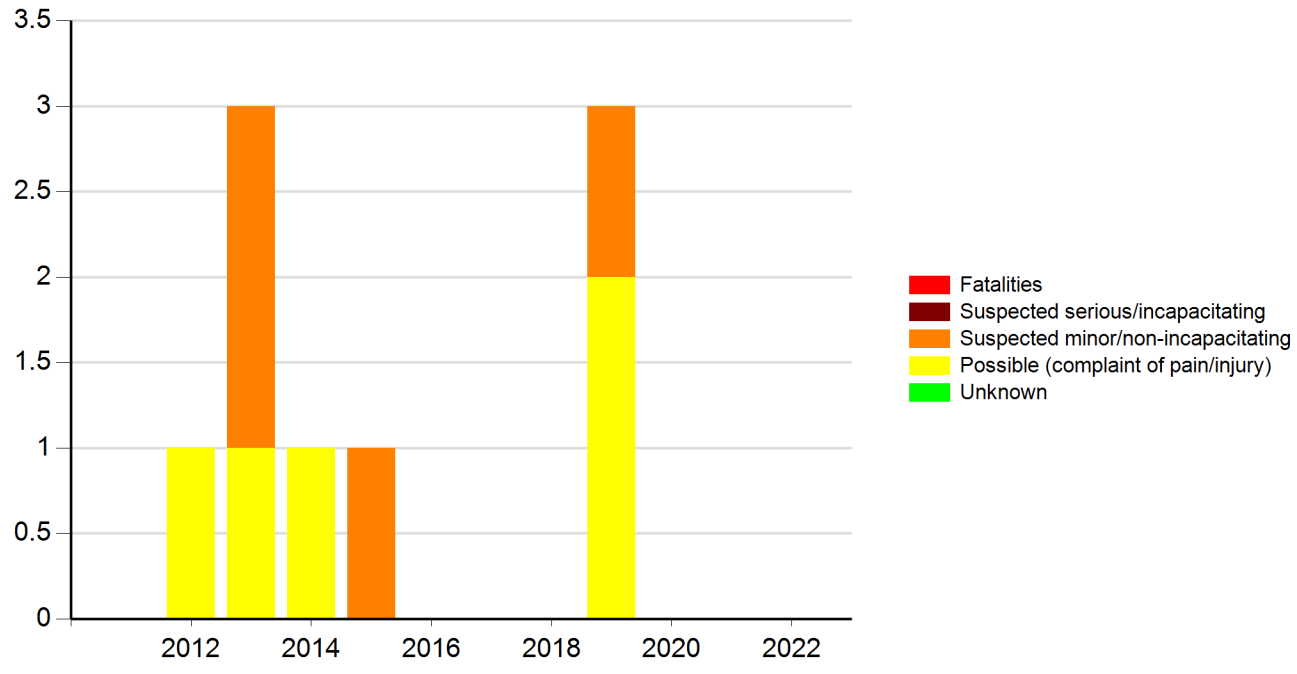
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2011	0	0	0	0	0	0
2012	0	0	0	1	0	1
2013	0	0	2	1	0	3
2014	0	0	0	1	0	1
2015	0	0	1	0	0	1
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	1	2	0	3
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
Total	0	0	4	5	0	9

Injury Status/Year



Meeting the following criteria

Jurisdiction: Statewide
Year: 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021
Map Selection: Yes
Filter: None

Analyst Information

#2 Devils Glen Road & State Street

Iowa Crash Analysis Tool
Quick Report
2012-2021

Crash Severity	40
Fatal Crash	0
Suspected Serious Injury Crash	2
Suspected Minor Injury Crash	8
Possible/Unknown Injury Crash	6
Property Damage Only	24

Injury Status Summary	27
Fatalities	0
Suspected serious/incapacitating	2
Suspected minor/non-incapacitating	15
Possible (complaint of pain/injury)	10
Unknown	0

Property/Vehicles/Occupants	
Property Damage Total (dollars):	280,900.00
Average (per crash dollars):	7,022.50
Total Vehicles:	79.00
Average (per crash):	1.98
Total Occupants:	101.00
Average (per crash):	2.53

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.68
Major Injuries/Crash:	0.05
Minor Injuries/Crash:	0.38
Possible/Unknown Injuries/Crash:	0.25

Major Cause			39
Animal	0	Ran traffic signal	7
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	4
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	5	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	3
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless, erratic, ca...	0	Followed too close	7
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	0	Made improper turn	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	1	Ran off road - right	0
Ran off road - straight	2	Ran off road - left	0
Lost control	4	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	0
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	6
Unknown	0	Not reported	0
Other: No improper action	0		

Time of Day/Day of Week

Day of Week	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reported	Total
Sunday	0	0	0	1	0	0	0	1	1	0	0	0	0	3
Monday	0	0	1	1	0	2	0	0	1	0	1	0	0	6
Tuesday	0	0	0	1	1	0	1	1	1	0	0	0	0	5
Wednesday	0	0	0	1	0	0	0	1	2	0	1	0	0	5
Thursday	0	0	2	0	1	0	1	1	3	0	0	0	0	8
Friday	0	0	0	1	4	1	1	1	2	1	0	0	0	11
Saturday	0	0	0	0	0	0	0	0	0	0	1	1	0	2
Total	0	0	3	5	6	3	3	5	10	1	3	1	0	40

Manner of Crash Collision	40
Non-collision (single vehicle)	6
Head-on (front to front)	1
Rear-end (front to rear)	17
Angle, oncoming left turn	9
Broadside (front to side)	5
Sideswipe, same direction	2
Sideswipe, opposite direction	0
Rear to rear	0
Rear to side	0
Not reported	0
Other	0
Unknown	0

Surface Conditions	40
Dry	33
Wet	6
Ice/frost	0
Snow	0
Slush	0
Mud, dirt	0
Water (standing or moving)	0
Sand	1
Oil	0
Gravel	0
Not reported	0
Other	0
Unknown	0

Fixed Object Struck			79
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	1	Culvert/pipe opening	0
Guardrail - face	0	Guardrail - end	0
Concrete traffic barrier (median or right sid...	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	1	Traffic sign support	0
Traffic signal support	1	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	1	None (no fixed object struck)	75

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	**Total**
< 14	0	0	0	0	0
= 14	0	0	0	0	0
= 15	0	0	0	0	0
= 16	0	0	0	0	0
= 17	1	0	0	0	1
= 18	1	1	0	0	2
= 19	0	0	0	0	0
= 20	0	1	1	0	2
>= 21 and <= 24	3	6	0	0	9
>= 25 and <= 29	2	3	0	0	5
>= 30 and <= 34	3	5	0	0	8
>= 35 and <= 39	3	8	0	0	11
>= 40 and <= 44	1	3	0	0	4
>= 45 and <= 49	3	4	0	0	7
>= 50 and <= 54	3	6	1	0	10
>= 55 and <= 59	2	6	0	0	8
>= 60 and <= 64	2	3	1	0	6
>= 65 and <= 69	0	2	0	0	2
>= 70 and <= 74	0	2	0	0	2
>= 75 and <= 79	0	1	0	0	1
>= 80 and <= 84	0	1	0	0	1
>= 85 and <= 89	0	0	0	0	0
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	24	52	3	0	79

Drug/Alcohol Related	**40**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	1
Drug and Alcohol (< Statutory)	0
Drug and Alcohol (Statutory)	0
Refused	1
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	38

Alcohol Test Given	**79**
None	76
Blood	0
Urine	0
Breath	2
Vitreous	0
Refused	1
Not reported	0

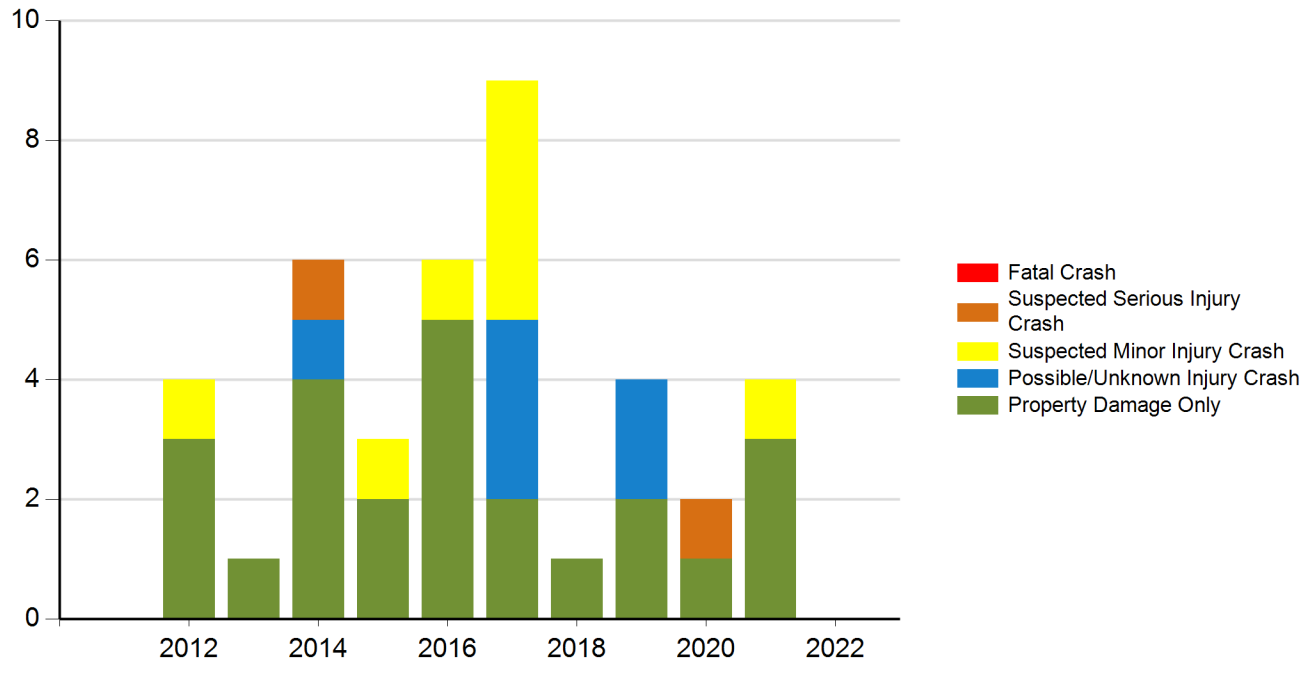
Drug Test Given	**79**
None	78
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	1
Not reported	0

Drug Test Result	**36**
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	36
Other	0

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	**Total**
2011	0	0	0	0	0	0
2012	0	0	1	0	3	4
2013	0	0	0	0	1	1
2014	0	1	0	1	4	6
2015	0	0	1	0	2	3
2016	0	0	1	0	5	6
2017	0	0	4	3	2	9
2018	0	0	0	0	1	1
2019	0	0	0	2	2	4
2020	0	1	0	0	1	2
2021	0	0	1	0	3	4
2022	0	0	0	0	0	0
Total	0	2	8	6	24	40

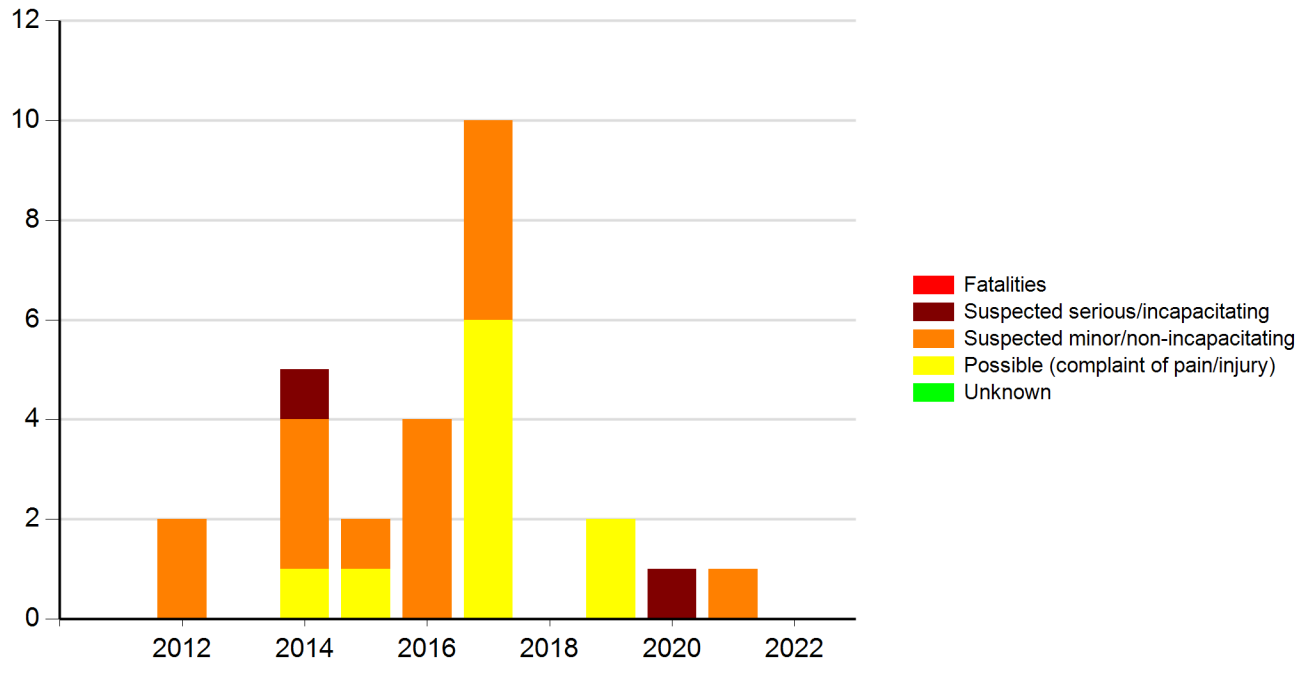
Severity/Year



Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Unknown	Total
2011	0	0	0	0	0	0
2012	0	0	2	0	0	2
2013	0	0	0	0	0	0
2014	0	1	3	1	0	5
2015	0	0	1	1	0	2
2016	0	0	4	0	0	4
2017	0	0	4	6	0	10
2018	0	0	0	0	0	0
2019	0	0	0	2	0	2
2020	0	1	0	0	0	1
2021	0	0	1	0	0	1
2022	0	0	0	0	0	0
Total	0	2	15	10	0	27

Injury Status/Year



Meeting the following criteria

Jurisdiction: Statewide
Year: 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021
Map Selection: Yes
Filter: None

Analyst Information

Appendix 3

Volume-to-Capacity Ratios

Volume-to-capacity (v/c) is defined as the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions. The v/c ratio is calculated by dividing the total hourly volume of vehicles using the intersection by the hourly capacity. This ratio is used to determine an intersection's sufficiency to accommodate vehicular demand. A v/c ratio less than 0.85 generally indicates adequate capacity is available and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable and delay and queuing conditions may occur. Table 1 presents ranges of v/c ratios and their corresponding level of service (LOS). The ranges are taken from Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and Interim Materials on Highway Capacity, MCHRP Circular 212, 1982.

Table 1 V/C Ratio LOS Criteria for Signalized Intersections

LOS	Signalized Intersection V/C Ratio
A	< 0.600
B	0.601 to 0.700
C	0.701 to 0.800
D	0.801 to 0.900
E	0.901 to 1.000
F	> 1.001

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and Interim Materials on Highway Capacity, MCHRP Circular 212, 1982.

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.100

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	36	161	257	30	40	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	5.00	2.00	7.00	8.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	161	257	30	40	44
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	47	75	9	12	13
Total Analysis Volume [veh/h]	42	187	299	35	47	51
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.10	0.06
d_M, Delay for Movement [s/veh]	8.16	0.00	0.00	0.00	13.75	10.36
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.11	0.06	0.00	0.00	0.57	0.57
95th-Percentile Queue Length [ft/ln]	2.77	1.38	0.00	0.00	14.15	14.15
d_A, Approach Delay [s/veh]	1.50		0.00		11.99	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.30					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.372

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	4	1	3	133	2	146	65	435	15	8	662	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	25.00	0.00	0.00	3.00	0.00	2.00	5.00	7.00	20.00	13.00	5.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	44	0	0	5	0	0	38
Total Hourly Volume [veh/h]	4	1	2	133	2	102	65	435	10	8	662	90
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	37	1	28	18	121	3	2	184	25
Total Analysis Volume [veh/h]	4	1	2	148	2	113	72	483	11	9	736	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	14	14	14	14	55	48	48	55	44	44
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.68	0.59	0.59	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.12	0.08	0.09	0.15	0.15	0.01	0.24	0.07
s, saturation flow rate [veh/h]	937	1530	1262	1457	780	1615	1603	810	3127	1385
c, Capacity [veh/h]	156	258	266	246	577	961	953	628	1727	765
d1, Uniform Delay [s]	34.75	27.70	33.53	30.02	5.00	7.76	7.76	4.20	10.48	8.64
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.02	1.81	1.39	0.44	0.65	0.66	0.01	0.77	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.01	0.56	0.47	0.12	0.26	0.26	0.01	0.43	0.13
d, Delay for Lane Group [s/veh]	34.81	27.72	35.33	31.40	5.45	8.41	8.42	4.21	11.25	8.99
Lane Group LOS	C	C	D	C	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.07	0.05	2.81	2.01	0.35	1.84	1.83	0.03	3.38	0.79
50th-Percentile Queue Length [ft/ln]	1.85	1.20	70.32	50.24	8.73	45.97	45.72	0.87	84.41	19.75
95th-Percentile Queue Length [veh/ln]	0.13	0.09	5.06	3.62	0.63	3.31	3.29	0.06	6.08	1.42
95th-Percentile Queue Length [ft/ln]	3.34	2.16	126.57	90.44	15.72	82.74	82.29	1.57	151.93	35.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.81	27.72	27.72	35.33	31.40	31.40	5.45	8.41	8.42	4.21	11.25	8.99
Movement LOS	C	C	C	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	31.78			33.62			8.03			10.91		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	13.58											
Intersection LOS	B											
Intersection V/C	0.372											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.915	2.365	2.680	3.031
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.573	2.066	2.031	2.288
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	17.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.201

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	61	323	218	97	67	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	3.00	3.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	323	218	97	67	45
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	93	63	28	19	13
Total Analysis Volume [veh/h]	70	371	251	111	77	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.20	0.06
d_M, Delay for Movement [s/veh]	8.16	0.00	0.00	0.00	17.01	12.05
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.18	0.09	0.00	0.00	1.05	1.05
95th-Percentile Queue Length [ft/ln]	4.61	2.30	0.00	0.00	26.34	26.34
d_A, Approach Delay [s/veh]	1.30		0.00		15.01	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.69					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	14	14	8	131	8	112	181	464	5	10	698	178
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	7.00	0.00	2.00	0.00	4.00	1.00	7.00	40.00	30.00	5.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	34	0	0	2	0	0	53
Total Hourly Volume [veh/h]	14	14	6	131	8	78	181	464	3	10	698	125
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	4	2	38	2	23	53	135	1	3	203	36
Total Analysis Volume [veh/h]	16	16	7	152	9	91	210	540	3	12	812	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	15	15	15	15	54	46	46	54	41	41
g / C, Green / Cycle	0.18	0.18	0.18	0.18	0.67	0.58	0.58	0.67	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.01	0.02	0.12	0.07	0.26	0.17	0.17	0.02	0.26	0.10
s, saturation flow rate [veh/h]	1184	1533	1249	1473	810	1615	1612	668	3127	1442
c, Capacity [veh/h]	204	281	270	270	570	932	930	518	1601	738
d1, Uniform Delay [s]	33.09	27.11	33.38	28.64	6.75	8.60	8.60	4.67	12.87	10.59
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.12	1.85	0.85	1.83	0.79	0.79	0.02	1.15	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.08	0.56	0.37	0.37	0.29	0.29	0.02	0.51	0.20
d, Delay for Lane Group [s/veh]	33.25	27.23	35.23	29.49	8.58	9.39	9.39	4.69	14.02	11.19
Lane Group LOS	C	C	D	C	A	A	A	A	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.29	0.37	2.89	1.68	1.25	2.19	2.19	0.05	4.38	1.34
50th-Percentile Queue Length [ft/ln]	7.19	9.15	72.24	41.89	31.36	54.74	54.65	1.27	109.59	33.39
95th-Percentile Queue Length [veh/ln]	0.52	0.66	5.20	3.02	2.26	3.94	3.93	0.09	7.82	2.40
95th-Percentile Queue Length [ft/ln]	12.95	16.46	130.03	75.41	56.44	98.54	98.37	2.29	195.43	60.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.25	27.23	27.23	35.23	29.49	29.49	8.58	9.39	9.39	4.69	14.02	11.19
Movement LOS	C	C	C	D	C	C	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	29.70			32.95			9.17			13.48		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	14.62											
Intersection LOS	B											
Intersection V/C	0.442											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.929	2.506	2.755	3.103
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.627	2.032	2.182	2.403
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.097

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	36	161	257	30	40	44
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	1.0143	1.0143
Heavy Vehicles Percentage [%]	8.00	5.00	2.00	7.00	8.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	152	242	28	41	45
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	44	70	8	12	13
Total Analysis Volume [veh/h]	40	177	281	33	48	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.10	0.06
d_M, Delay for Movement [s/veh]	8.10	0.00	0.00	0.00	13.37	10.25
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.10	0.05	0.00	0.00	0.56	0.56
95th-Percentile Queue Length [ft/ln]	2.58	1.29	0.00	0.00	13.94	13.94
d_A, Approach Delay [s/veh]	1.49		0.00		11.75	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.366

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	4	1	3	133	2	146	65	435	15	8	662	128
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	1.0067	1.0067	1.0067
Heavy Vehicles Percentage [%]	25.00	0.00	0.00	3.00	0.00	2.00	5.00	7.00	20.00	13.00	5.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	41	0	0	5	0	0	39
Total Hourly Volume [veh/h]	4	1	2	125	2	97	64	431	10	8	666	90
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	35	1	27	18	120	3	2	185	25
Total Analysis Volume [veh/h]	4	1	2	139	2	108	71	479	11	9	740	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	13	13	13	13	55	48	48	55	45	45
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.69	0.60	0.60	0.69	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.11	0.08	0.09	0.15	0.15	0.01	0.24	0.07
s, saturation flow rate [veh/h]	941	1530	1262	1457	776	1615	1603	811	3127	1385
c, Capacity [veh/h]	153	249	259	237	580	970	963	635	1747	773
d1, Uniform Delay [s]	34.94	28.09	33.69	30.32	4.83	7.52	7.52	4.04	10.21	8.40
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.02	1.71	1.41	0.43	0.63	0.63	0.01	0.76	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.01	0.54	0.46	0.12	0.25	0.25	0.01	0.42	0.13
d, Delay for Lane Group [s/veh]	35.01	28.11	35.40	31.73	5.26	8.15	8.16	4.05	10.96	8.75
Lane Group LOS	D	C	D	C	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.07	0.05	2.64	1.94	0.33	1.78	1.77	0.03	3.32	0.77
50th-Percentile Queue Length [ft/ln]	1.86	1.21	66.04	48.38	8.32	44.40	44.16	0.84	83.06	19.31
95th-Percentile Queue Length [veh/ln]	0.13	0.09	4.75	3.48	0.60	3.20	3.18	0.06	5.98	1.39
95th-Percentile Queue Length [ft/ln]	3.35	2.18	118.87	87.08	14.98	79.92	79.48	1.51	149.50	34.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.01	28.11	28.11	35.40	31.73	31.73	5.26	8.15	8.16	4.05	10.96	8.75
Movement LOS	D	C	C	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	32.05			33.78			7.79			10.63		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	13.22											
Intersection LOS	B											
Intersection V/C	0.366											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.915	2.356	2.677	3.018
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.573	2.038	2.027	2.292
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	61	323	218	97	67	45
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	1.0143	1.0143
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	3.00	3.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	305	206	91	68	46
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	88	59	26	20	13
Total Analysis Volume [veh/h]	67	351	237	105	78	53
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.19	0.06
d_M, Delay for Movement [s/veh]	8.10	0.00	0.00	0.00	16.32	11.77
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.17	0.09	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft/ln]	4.32	2.16	0.00	0.00	25.37	25.37
d_A, Approach Delay [s/veh]	1.30		0.00		14.48	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.74					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	14.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	14	14	8	131	8	112	181	464	5	10	698	178
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	1.0067	1.0067	1.0067
Heavy Vehicles Percentage [%]	0.00	7.00	0.00	2.00	0.00	4.00	1.00	7.00	40.00	30.00	5.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	32	0	0	2	0	0	54
Total Hourly Volume [veh/h]	13	13	6	124	8	74	179	460	3	10	703	125
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	4	2	36	2	22	52	134	1	3	204	36
Total Analysis Volume [veh/h]	15	15	7	144	9	86	208	535	3	12	817	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	14	14	14	14	54	47	47	54	42	42
g / C, Green / Cycle	0.18	0.18	0.18	0.18	0.68	0.58	0.58	0.68	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.12	0.06	0.26	0.17	0.17	0.02	0.26	0.10
s, saturation flow rate [veh/h]	1189	1530	1250	1474	804	1615	1612	669	3127	1442
c, Capacity [veh/h]	200	269	261	260	573	943	941	525	1628	751
d1, Uniform Delay [s]	33.39	27.55	33.66	29.02	6.49	8.31	8.31	4.47	12.45	10.23
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.13	1.81	0.86	1.78	0.76	0.76	0.02	1.11	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.08	0.55	0.37	0.36	0.29	0.29	0.02	0.50	0.19
d, Delay for Lane Group [s/veh]	33.54	27.67	35.47	29.88	8.28	9.07	9.07	4.49	13.56	10.80
Lane Group LOS	C	C	D	C	A	A	A	A	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.27	0.35	2.74	1.60	1.20	2.11	2.11	0.05	4.31	1.30
50th-Percentile Queue Length [ft/ln]	6.78	8.84	68.56	40.08	30.05	52.85	52.76	1.23	107.78	32.58
95th-Percentile Queue Length [veh/ln]	0.49	0.64	4.94	2.89	2.16	3.81	3.80	0.09	7.72	2.35
95th-Percentile Queue Length [ft/ln]	12.20	15.90	123.40	72.14	54.09	95.13	94.97	2.21	192.91	58.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.54	27.67	27.67	35.47	29.88	29.88	8.28	9.07	9.07	4.49	13.56	10.80
Movement LOS	C	C	C	D	C	C	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	30.05			33.25			8.85			13.04		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	14.21											
Intersection LOS	B											
Intersection V/C	0.435											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.929	2.500	2.751	3.092
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.624	2.007	2.177	2.408
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: Devils Glen Road & Access Point

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Access Point	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Access Point	
Base Volume Input [veh/h]	0	193	270	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	6	17	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	193	270	6	17	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	48	68	2	4	6
Total Analysis Volume [veh/h]	8	193	270	6	17	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	7.82	0.00	0.00	0.00	11.40	9.33
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.01	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft/ln]	0.47	0.24	0.00	0.00	4.34	4.34
d_A, Approach Delay [s/veh]	0.31		0.00		10.21	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.91					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.104

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	36	161	257	30	40	44
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	1.0143	1.0143
Heavy Vehicles Percentage [%]	8.00	5.00	2.00	7.00	8.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	19	4	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	159	261	32	42	45
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	46	76	9	12	13
Total Analysis Volume [veh/h]	40	185	303	37	49	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.10	0.06
d_M, Delay for Movement [s/veh]	8.18	0.00	0.00	0.00	13.79	10.43
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.11	0.05	0.00	0.00	0.59	0.59
95th-Percentile Queue Length [ft/ln]	2.64	1.32	0.00	0.00	14.73	14.73
d_A, Approach Delay [s/veh]	1.45		0.00		12.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.32					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	13.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.376

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	4	1	3	133	2	146	65	435	15	8	662	128
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	1.0067	1.0067	1.0067
Heavy Vehicles Percentage [%]	25.00	0.00	0.00	3.00	0.00	2.00	5.00	7.00	20.00	13.00	5.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	10	0	9	3	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	44	0	0	5	0	0	40
Total Hourly Volume [veh/h]	4	1	2	135	2	103	67	431	10	8	666	93
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	38	1	29	19	120	3	2	185	26
Total Analysis Volume [veh/h]	4	1	2	150	2	114	74	479	11	9	740	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	14	14	14	14	55	47	47	55	44	44
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.68	0.59	0.59	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.12	0.08	0.09	0.15	0.15	0.01	0.24	0.07
s, saturation flow rate [veh/h]	936	1530	1262	1457	779	1615	1603	812	3127	1385
c, Capacity [veh/h]	157	260	269	248	574	958	951	628	1721	762
d1, Uniform Delay [s]	34.67	27.60	33.46	29.93	5.08	7.81	7.81	4.24	10.60	8.74
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.02	1.82	1.37	0.46	0.65	0.65	0.01	0.79	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.01	0.56	0.47	0.13	0.26	0.26	0.01	0.43	0.14
d, Delay for Lane Group [s/veh]	34.73	27.62	35.28	31.30	5.54	8.45	8.46	4.25	11.38	9.11
Lane Group LOS	C	C	D	C	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.07	0.05	2.85	2.02	0.36	1.83	1.82	0.04	3.42	0.82
50th-Percentile Queue Length [ft/ln]	1.85	1.20	71.24	50.59	9.07	45.78	45.53	0.88	85.61	20.53
95th-Percentile Queue Length [veh/ln]	0.13	0.09	5.13	3.64	0.65	3.30	3.28	0.06	6.16	1.48
95th-Percentile Queue Length [ft/ln]	3.33	2.16	128.23	91.05	16.32	82.41	81.96	1.59	154.09	36.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.73	27.62	27.62	35.28	31.30	31.30	5.54	8.46	8.46	4.25	11.38	9.11
Movement LOS	C	C	C	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	31.68			33.54			8.07			11.03		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	13.68											
Intersection LOS	B											
Intersection V/C	0.376											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.915	2.369	2.680	3.039
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.573	2.071	2.029	2.296
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: Devils Glen Road & Access Point

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Access Point	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Access Point	
Base Volume Input [veh/h]	0	373	297	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	0	0	16	10	15
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	373	297	16	10	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	93	74	4	3	4
Total Analysis Volume [veh/h]	22	373	297	16	10	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	7.95	0.00	0.00	0.00	12.86	9.35
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.03	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft/ln]	1.35	0.67	0.00	0.00	2.99	2.99
d_A, Approach Delay [s/veh]	0.44		0.00		10.76	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.61					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.213

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	61	323	218	97	67	45
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	1.0143	1.0143
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	3.00	3.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	12	3	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	323	218	94	72	46
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	93	63	27	21	13
Total Analysis Volume [veh/h]	67	371	251	108	83	53
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.21	0.06
d_M, Delay for Movement [s/veh]	8.15	0.00	0.00	0.00	17.06	12.22
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.18	0.09	0.00	0.00	1.13	1.13
95th-Percentile Queue Length [ft/ln]	4.39	2.19	0.00	0.00	28.17	28.17
d_A, Approach Delay [s/veh]	1.25		0.00		15.17	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.80					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	14	14	8	131	8	112	181	464	5	10	698	178
Base Volume Adjustment Factor	0.9428	0.9428	0.9428	0.9428	0.9428	0.9428	0.9905	0.9905	0.9905	1.0067	1.0067	1.0067
Heavy Vehicles Percentage [%]	0.00	7.00	0.00	2.00	0.00	4.00	1.00	7.00	40.00	30.00	5.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	6	8	0	0	0	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	34	0	0	2	0	0	57
Total Hourly Volume [veh/h]	13	13	6	130	8	78	187	460	3	10	703	132
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	4	2	38	2	23	54	134	1	3	204	38
Total Analysis Volume [veh/h]	15	15	7	151	9	91	217	535	3	12	817	153
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	15	15	15	15	54	46	46	54	41	41
g / C, Green / Cycle	0.18	0.18	0.18	0.18	0.67	0.58	0.58	0.67	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.12	0.07	0.27	0.17	0.17	0.02	0.26	0.11
s, saturation flow rate [veh/h]	1184	1530	1250	1473	810	1615	1612	670	3127	1442
c, Capacity [veh/h]	203	278	269	268	571	934	933	521	1600	738
d1, Uniform Delay [s]	33.18	27.18	33.42	28.74	6.80	8.53	8.53	4.63	12.92	10.68
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.15	0.12	1.84	0.86	1.92	0.78	0.78	0.02	1.17	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.08	0.56	0.37	0.38	0.29	0.29	0.02	0.51	0.21
d, Delay for Lane Group [s/veh]	33.33	27.30	35.26	29.60	8.72	9.31	9.31	4.64	14.09	11.32
Lane Group LOS	C	C	D	C	A	A	A	A	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.27	0.35	2.87	1.68	1.30	2.15	2.15	0.05	4.43	1.42
50th-Percentile Queue Length [ft/ln]	6.75	8.76	71.78	41.99	32.47	53.87	53.78	1.27	110.71	35.52
95th-Percentile Queue Length [veh/ln]	0.49	0.63	5.17	3.02	2.34	3.88	3.87	0.09	7.88	2.56
95th-Percentile Queue Length [ft/ln]	12.15	15.77	129.20	75.58	58.45	96.97	96.81	2.28	196.98	63.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.33	27.30	27.30	35.26	29.60	29.60	8.72	9.31	9.31	4.64	14.09	11.32
Movement LOS	C	C	C	D	C	C	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	29.74			33.01			9.14			13.54		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	14.61											
Intersection LOS	B											
Intersection V/C	0.444											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.929	2.516	2.755	3.110
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.624	2.030	2.184	2.417
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.083

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	23	101	161	19	45	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	5.00	2.00	7.00	8.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	101	161	19	45	50
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	29	47	6	13	15
Total Analysis Volume [veh/h]	27	117	187	22	52	58
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.08	0.06
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	11.54	9.68
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.06	0.03	0.00	0.00	0.51	0.51
95th-Percentile Queue Length [ft/ln]	1.57	0.78	0.00	0.00	12.66	12.66
d_A, Approach Delay [s/veh]	1.46		0.00		10.56	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.96					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.341

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	3	1	2	83	1	92	61	409	14	8	710	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	25.00	0.00	0.00	3.00	0.00	2.00	5.00	7.00	20.00	13.00	5.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	28	0	0	4	0	0	41
Total Hourly Volume [veh/h]	3	1	1	83	1	64	61	409	10	8	710	97
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	0	23	0	18	17	114	3	2	197	27
Total Analysis Volume [veh/h]	3	1	1	92	1	71	68	454	11	9	789	108
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	10	10	10	10	59	51	51	59	48	48
g / C, Green / Cycle	0.12	0.12	0.12	0.12	0.73	0.64	0.64	0.73	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.07	0.05	0.09	0.14	0.14	0.01	0.25	0.08
s, saturation flow rate [veh/h]	974	1571	1263	1457	744	1615	1602	824	3127	1385
c, Capacity [veh/h]	143	192	215	178	586	1035	1026	678	1874	830
d1, Uniform Delay [s]	35.84	30.84	35.02	32.40	3.96	6.04	6.04	3.09	8.59	6.97
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.02	1.34	1.47	0.40	0.51	0.51	0.01	0.70	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.01	0.43	0.40	0.12	0.23	0.23	0.01	0.42	0.13
d, Delay for Lane Group [s/veh]	35.90	30.86	36.36	33.87	4.37	6.54	6.55	3.10	9.29	7.29
Lane Group LOS	D	C	D	C	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.06	0.03	1.76	1.31	0.25	1.41	1.40	0.03	3.11	0.72
50th-Percentile Queue Length [ft/ln]	1.42	0.86	43.98	32.87	6.31	35.22	35.03	0.63	77.75	18.12
95th-Percentile Queue Length [veh/ln]	0.10	0.06	3.17	2.37	0.45	2.54	2.52	0.05	5.60	1.30
95th-Percentile Queue Length [ft/ln]	2.56	1.55	79.16	59.16	11.35	63.39	63.05	1.14	139.96	32.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.90	30.86	30.86	36.36	33.87	33.87	4.37	6.55	6.55	3.10	9.29	7.29
Movement LOS	D	C	C	D	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	33.88			35.27			6.27			8.99		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	10.85											
Intersection LOS	B											
Intersection V/C	0.341											

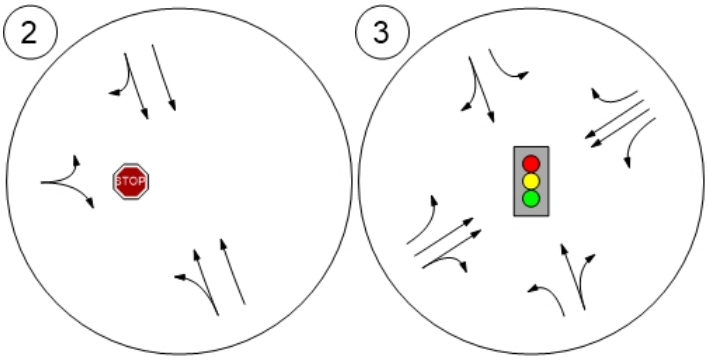
Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.914	2.313	2.666	2.951
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.570	1.876	2.003	2.341
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Lane Configuration and Traffic Control



Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.155

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	39	203	137	60	75	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	3.00	3.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	203	137	60	75	51
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	58	39	17	22	15
Total Analysis Volume [veh/h]	45	233	157	69	86	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.15	0.07
d_M, Delay for Movement [s/veh]	7.75	0.00	0.00	0.00	13.00	10.52
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.10	0.05	0.00	0.00	0.83	0.83
95th-Percentile Queue Length [ft/ln]	2.58	1.29	0.00	0.00	20.87	20.87
d_A, Approach Delay [s/veh]	1.25		0.00		11.99	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.22					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.402

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	9	9	5	82	5	70	170	437	5	11	750	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	7.00	0.00	2.00	0.00	4.00	1.00	7.00	40.00	30.00	5.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	21	0	0	2	0	0	57
Total Hourly Volume [veh/h]	9	9	3	82	5	49	170	437	3	11	750	133
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	1	24	1	14	49	127	1	3	218	39
Total Analysis Volume [veh/h]	10	10	3	95	6	57	198	508	3	13	872	155
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	10	10	10	10	58	51	51	58	46	46
g / C, Green / Cycle	0.12	0.12	0.12	0.12	0.73	0.63	0.63	0.73	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.08	0.04	0.26	0.16	0.16	0.02	0.28	0.11
s, saturation flow rate [veh/h]	1224	1552	1261	1475	754	1615	1612	680	3127	1442
c, Capacity [veh/h]	168	191	210	181	578	1026	1024	569	1817	838
d1, Uniform Delay [s]	35.34	31.02	35.41	32.13	5.26	6.32	6.32	3.19	9.74	7.87
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.15	0.15	1.52	1.14	1.61	0.58	0.58	0.02	0.91	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.07	0.45	0.35	0.34	0.25	0.25	0.02	0.48	0.19
d, Delay for Lane Group [s/veh]	35.49	31.17	36.93	33.27	6.87	6.91	6.91	3.21	10.65	8.36
Lane Group LOS	D	C	D	C	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.19	0.23	1.83	1.13	0.86	1.62	1.62	0.04	3.84	1.15
50th-Percentile Queue Length [ft/ln]	4.68	5.63	45.81	28.34	21.55	40.47	40.40	0.94	96.03	28.77
95th-Percentile Queue Length [veh/ln]	0.34	0.41	3.30	2.04	1.55	2.91	2.91	0.07	6.91	2.07
95th-Percentile Queue Length [ft/ln]	8.43	10.14	82.45	51.00	38.79	72.84	72.72	1.69	172.85	51.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.49	31.17	31.17	36.93	33.27	33.27	6.87	6.91	6.91	3.21	10.65	8.36
Movement LOS	D	C	C	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	33.05			35.47			6.90			10.22		
Approach LOS	C			D			A			B		
d_I, Intersection Delay [s/veh]	11.34											
Intersection LOS	B											
Intersection V/C	0.402											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.925	2.467	2.737	3.024
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.601	1.855	2.146	2.465
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: Devils Glen Road & Access Point

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Access Point	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Access Point	
Base Volume Input [veh/h]	0	146	180	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	6	17	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	146	180	6	17	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	37	45	2	4	6
Total Analysis Volume [veh/h]	8	146	180	6	17	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	7.61	0.00	0.00	0.00	10.42	9.01
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.01	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft/ln]	0.44	0.22	0.00	0.00	3.84	3.84
d_A, Approach Delay [s/veh]	0.40		0.00		9.61	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.17					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.088

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	23	101	161	19	45	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	5.00	2.00	7.00	8.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	19	4	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	108	180	23	46	50
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	31	52	7	13	15
Total Analysis Volume [veh/h]	27	126	209	27	53	58
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.09	0.06
d_M, Delay for Movement [s/veh]	7.86	0.00	0.00	0.00	11.87	9.83
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.06	0.03	0.00	0.00	0.53	0.53
95th-Percentile Queue Length [ft/ln]	1.61	0.80	0.00	0.00	13.33	13.33
d_A, Approach Delay [s/veh]	1.39		0.00		10.80	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.82					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.351

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	3	1	2	83	1	92	61	409	14	8	710	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	25.00	0.00	0.00	3.00	0.00	2.00	5.00	7.00	20.00	13.00	5.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	10	0	9	3	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	30	0	0	4	0	0	43
Total Hourly Volume [veh/h]	3	1	1	93	1	71	64	409	10	8	710	99
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	0	26	0	20	18	114	3	2	197	28
Total Analysis Volume [veh/h]	3	1	1	103	1	79	71	454	11	9	789	110
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	10	10	10	10	58	51	51	58	48	48
g / C, Green / Cycle	0.13	0.13	0.13	0.13	0.73	0.64	0.64	0.73	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00	0.08	0.05	0.10	0.14	0.14	0.01	0.25	0.08
s, saturation flow rate [veh/h]	967	1571	1263	1456	746	1615	1602	825	3127	1385
c, Capacity [veh/h]	142	196	220	182	581	1030	1022	673	1861	824
d1, Uniform Delay [s]	35.91	30.67	35.03	32.42	4.13	6.14	6.14	3.17	8.77	7.12
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.02	1.54	1.67	0.43	0.51	0.52	0.01	0.71	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.01	0.47	0.44	0.12	0.23	0.23	0.01	0.42	0.13
d, Delay for Lane Group [s/veh]	35.97	30.69	36.58	34.08	4.56	6.65	6.66	3.17	9.48	7.46
Lane Group LOS	D	C	D	C	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.06	0.03	1.98	1.46	0.27	1.44	1.43	0.03	3.17	0.75
50th-Percentile Queue Length [ft/ln]	1.42	0.86	49.44	36.62	6.78	35.89	35.69	0.65	79.36	18.86
95th-Percentile Queue Length [veh/ln]	0.10	0.06	3.56	2.64	0.49	2.58	2.57	0.05	5.71	1.36
95th-Percentile Queue Length [ft/ln]	2.56	1.54	88.99	65.92	12.21	64.60	64.24	1.17	142.84	33.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.97	30.69	30.69	36.58	34.08	34.08	4.56	6.65	6.66	3.17	9.48	7.46
Movement LOS	D	C	C	D	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	33.86			35.49			6.37			9.17		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	11.28											
Intersection LOS	B											
Intersection V/C	0.351											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.914	2.326	2.670	2.973
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.570	1.911	2.005	2.344
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: Devils Glen Road & Access Point

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Access Point	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Access Point	
Base Volume Input [veh/h]	0	278	197	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	0	0	16	10	15
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	278	197	16	10	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	70	49	4	3	4
Total Analysis Volume [veh/h]	22	278	197	16	10	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	7.70	0.00	0.00	0.00	11.32	9.00
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.02	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	1.24	0.62	0.00	0.00	2.56	2.56
d_A, Approach Delay [s/veh]	0.56		0.00		9.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.78					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Devils Glen Road & Central Avenue

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.170

Intersection Setup

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Devils Glen Road		Devils Glen Road		Central Avenue	
Base Volume Input [veh/h]	39	203	137	60	75	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	3.00	3.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	12	3	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	221	149	63	79	51
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	64	43	18	23	15
Total Analysis Volume [veh/h]	45	254	171	72	91	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.17	0.07
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	13.47	10.78
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.10	0.05	0.00	0.00	0.91	0.91
95th-Percentile Queue Length [ft/ln]	2.61	1.31	0.00	0.00	22.84	22.84
d_A, Approach Delay [s/veh]	1.17		0.00		12.41	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.20					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Devils Glen Road & State Street

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.412

Intersection Setup

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	550.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			35.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devils Glen Road			Devils Glen Road			State Street			State Street		
Base Volume Input [veh/h]	9	9	5	82	5	70	170	437	5	11	750	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	7.00	0.00	2.00	0.00	4.00	1.00	7.00	40.00	30.00	5.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	6	8	0	0	0	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	23	0	0	2	0	0	60
Total Hourly Volume [veh/h]	9	9	3	88	5	53	178	437	3	11	750	140
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	1	26	1	15	52	127	1	3	218	41
Total Analysis Volume [veh/h]	10	10	3	102	6	62	207	508	3	13	872	163
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	20	30	0	20	30	0
Amber [s]	0.0	4.1	0.0	0.0	4.1	0.0	3.6	4.5	0.0	3.6	4.5	0.0
All red [s]	0.0	1.3	0.0	0.0	1.3	0.0	3.0	1.8	0.0	2.7	1.8	0.0
Split [s]	0	23	0	0	23	0	19	44	0	13	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.4	0.0	0.0	3.4	0.0	4.6	4.3	0.0	4.3	4.3	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	5.40	5.40	5.40	5.40	6.30	6.30	6.30	6.30	6.30	6.30
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.40	3.40	0.00	4.30	4.30	0.00	4.30	4.30
g_i, Effective Green Time [s]	11	11	11	11	57	50	50	57	45	45
g / C, Green / Cycle	0.14	0.14	0.14	0.14	0.72	0.62	0.62	0.72	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.08	0.05	0.27	0.16	0.16	0.02	0.28	0.11
s, saturation flow rate [veh/h]	1219	1552	1261	1473	759	1615	1612	680	3127	1442
c, Capacity [veh/h]	173	212	219	201	579	1006	1004	566	1770	816
d1, Uniform Delay [s]	35.03	30.08	35.04	31.27	5.38	6.76	6.76	3.43	10.44	8.49
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	0.12	1.53	0.99	1.72	0.61	0.61	0.02	0.98	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.06	0.46	0.34	0.36	0.25	0.25	0.02	0.49	0.20
d, Delay for Lane Group [s/veh]	35.17	30.20	36.57	32.26	7.10	7.37	7.37	3.44	11.42	9.04
Lane Group LOS	D	C	D	C	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.19	0.22	1.96	1.20	0.98	1.71	1.70	0.04	4.06	1.29
50th-Percentile Queue Length [ft/ln]	4.66	5.52	49.00	30.02	24.43	42.63	42.56	1.03	101.50	32.13
95th-Percentile Queue Length [veh/ln]	0.34	0.40	3.53	2.16	1.76	3.07	3.06	0.07	7.31	2.31
95th-Percentile Queue Length [ft/ln]	8.38	9.93	88.21	54.03	43.98	76.73	76.60	1.86	182.70	57.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.17	30.20	30.20	36.57	32.26	32.26	7.10	7.37	7.37	3.44	11.42	9.04
Movement LOS	D	C	C	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	32.36			34.85			7.29			10.95		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	11.94											
Intersection LOS	B											
Intersection V/C	0.412											

Other Modes

g_Walk,mi, Effective Walk Time [s]	37.7	31.7	17.6	17.6
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.18	14.58	24.34	24.34
l_p,int, Pedestrian LOS Score for Intersection	1.925	2.482	2.741	3.042
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	943	793
d_b, Bicycle Delay [s]	24.34	24.34	11.18	14.58
l_b,int, Bicycle LOS Score for Intersection	1.601	1.878	2.154	2.474
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-