

TRAFFIC IMPACT STUDY

Variety Retail Store Marvin Burnett Road Lake City, Florida

October 3, 2023

prepared for:
FLORIDA DOT DISTRICT 2
and
THE CITY OF LAKE CITY

submitted on behalf of:
Concept Development, Inc.

prepared by:
The logo for HAGEN CONSULTING SERVICES, LLC features a stylized blue cross symbol to the left of the word "HAGEN" in a bold, sans-serif font. Below "HAGEN" are the words "CONSULTING" and "SERVICES, LLC" in a smaller, all-caps, sans-serif font.

PROFESSIONAL ENGINEER ENDORSEMENT

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Hagen Consulting Services, LLC is authorized via Registry No: 27955 to operate as an Engineering Business by the Florida Board of Professional Engineers, State of Florida, Department of Professional Regulation.

I have prepared or supervised the preparation of the evaluation, findings, conclusions, recommendations, and professional opinions/advice contained in this document. My endorsement constitutes my approval of these items.

PROJECT: Marvin Burnett Road Retail Store
LOCATION: Lake City, Florida
CLIENT: Concept Development, Inc.

The results contained in this report were developed using procedures and references standard to the transportation engineering practice. These references and procedures were applied using professional judgment and experience.

Name: Lawrence T. Hagen, P.E., PTOE, RSP
Florida P.E. No.: 43968



Lawrence T
Hagen

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This item has been digitally signed and sealed by
Lawrence T. Hagen on the date adjacent to the seal.

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EXECUTIVE SUMMARY

The results of the traffic impact analysis for the proposed variety retail store location at the intersection of State Road 47 and SW Marvin Burnett Road near the City of Lake City show that the traffic generated by the development will not have a significant impact on the operation of the roadway network surrounding it. The existing STOP-Controlled intersection adjacent to the project site will continue to operate well with the addition of the projected traffic from the development. Additionally, the nearby intersection of SW Bascom Norris Drive and SW Marvin Burnett Road will also continue to operate well.

The project location is within Columbia County south of the City of Lake City, Florida and State Road 47 is under the jurisdiction of the Florida DOT, District 2. This study utilized turning movement count data for the AM and PM Peak Hours collected by Hagen Consulting Services in July of 2023. The turning movement count information for the AM and PM Peak Hours of traffic were adjusted using a seasonal adjustment factor from FDOT's Peak Season Factor Category Report and a growth factor was applied to adjust traffic volumes to the build-out year (2024). The adjusted traffic volumes were then analyzed with and without the project traffic utilizing the Highway Capacity Manual (HCM) procedures.

The project traffic was developed using the Institute of Transportation Engineers (ITE) *Trip Generation* – 11th Edition. The ITE Land Use Code for a variety retail store was used to estimate the trips generated by the proposed 12,480 square foot building. The trips were then distributed on the transportation network to estimate the traffic impacts.

The HCM analysis showed that the intersections, and hence the roadway network adjacent to the site, will be able to accommodate the traffic from the proposed development without a significant degradation in operational performance. Traffic conditions in the area will continue to operate at a very good level that meets the needs of the traveling public.

INTRODUCTION

Hagen Consulting Services, LLC is assisting Concept Development, Inc. with the transportation impacts for the proposed new 10,640 square foot variety retail store in Columbia County, Florida. The site will serve the southern Lake City area. The proposed retail store site is located on SW Marvin Burnett Road, at the intersection with State Road 47. State Road 47 is under the jurisdiction of the Florida Department of Transportation, District Two. The proposed site will have a connection to SW Marvin Burnett Road. The site currently is undeveloped and heavily wooded. There is a single family home foundation and accessory shed and propane tank on the site. The project location is shown in **Figure 1** below.

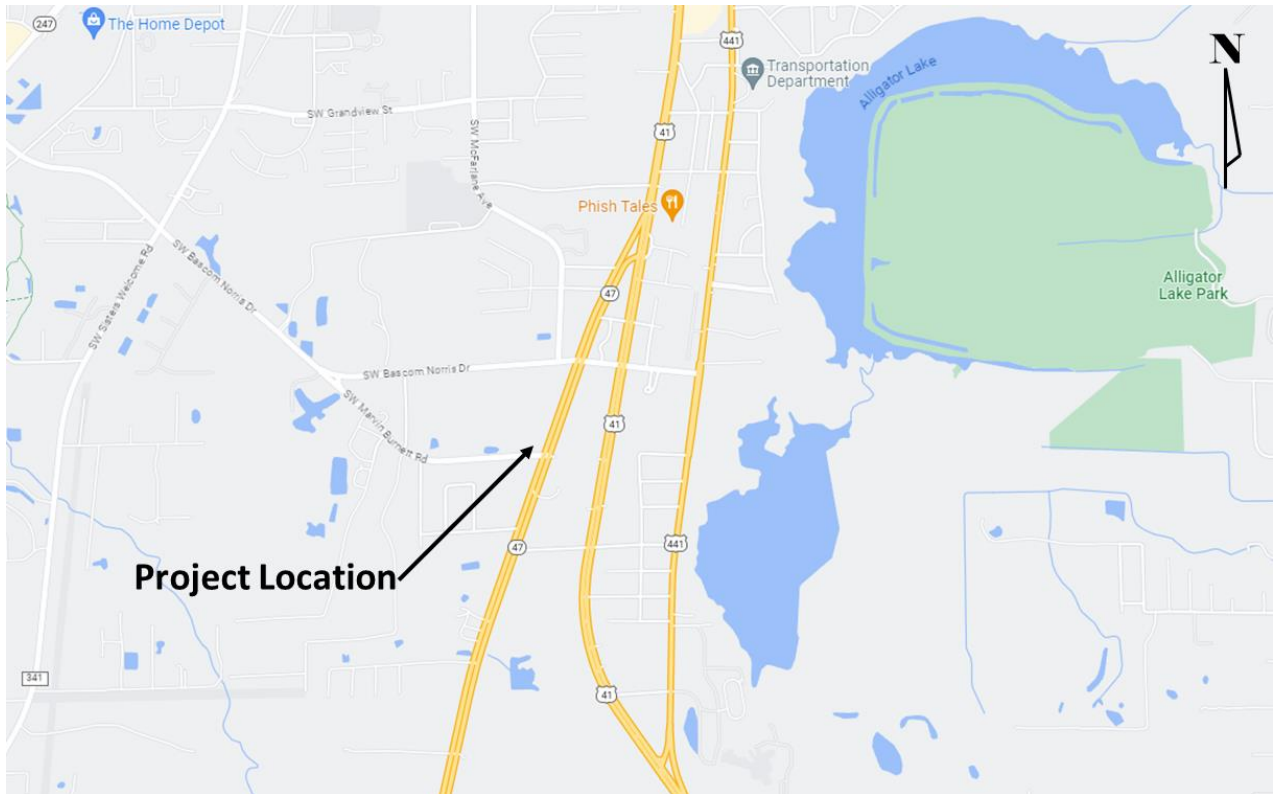


Figure 1 - Project Location Map

The preliminary site plan for the proposed retail store is shown in **Figure 2** on the following page.

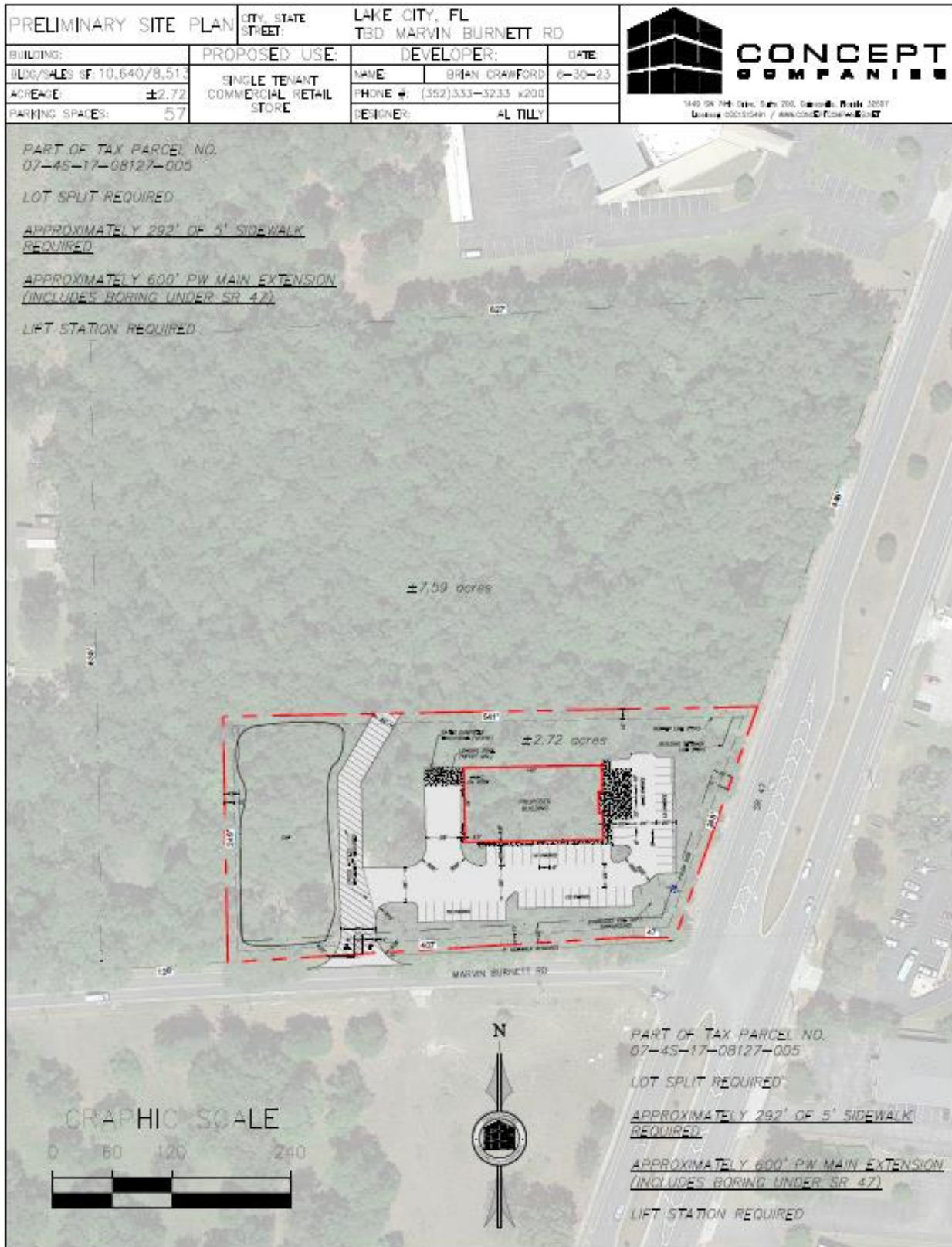


Figure 2 - Preliminary Site Plan

The 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation* is the recognized authoritative source for estimating the trips generated by developments such as the proposed variety retail store facility. According to *Trip Generation*, a variety retail facility such as proposed here falls under ITE Land Use Code 814 – Variety Store. The assessment of the traffic impacts of the proposed variety retail store will be based on the impacts to traffic in the AM and PM peak hour periods.

The traffic impacts of the proposed development will be based on a Highway Capacity Software analysis of the operation of the signalized intersection adjoining the site both with and without the traffic generated by the development. A comparison of the delay and Level Of Service (LOS) with and without the project traffic will serve as the basis of the analysis.

EXISTING CONDITIONS

State Road 47 is a four-lane divided highway with an urban typical section (curb and gutter). The posted speed limit in the vicinity of the project site is 45 miles per hour. There are existing bike lanes and sidewalks on both sides of the roadway. State Road 47 is classified as an Urban Minor Arterial. There are existing NB and SB left turn lanes at the Marvin Burnett Road intersection. Marvin Burnett Road is a two-lane roadway that is functionally classified as a minor collector rural with a posted speed of 35 miles per hour. The cross-section features a flush shoulder on the north side of the road and the south side has raised curb. There are currently no bike lanes or sidewalks present.

Existing AM and PM Peak Hour turning movement counts were collected at the intersection of State Road 47 and Marvin Burnett Road. Two hours of AM Peak data (7:00 AM – 9:00 AM) and two hours of PM Peak data (4:00 PM – 6:00 PM) were collected. From these counts, the AM Peak Hour (7:30 – 8:30 AM) and PM Peak Hour (4:30 – 5:30 PM) turning movement counts were determined. The AM and PM Peak Hour turning movement counts are shown in **Figure 3** below.

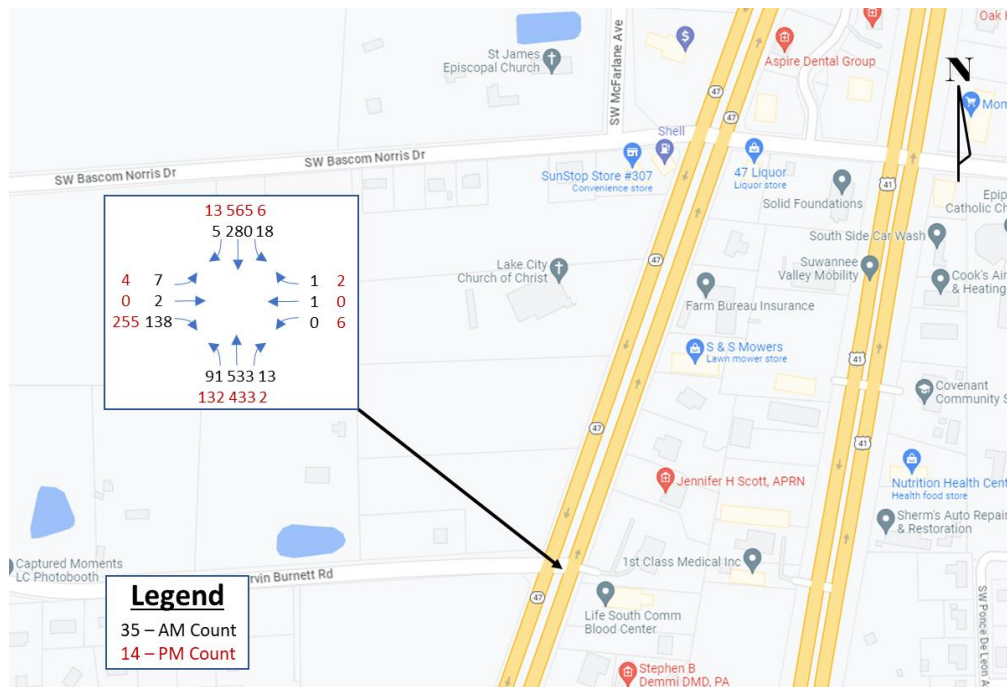


Figure 3 - Existing AM and PM Peak Hour Turning Movement Counts

The raw turning movement count data for the AM and PM Peak Hour is included in Appendix A.

TRIP GENERATION

The Institute of Transportation Engineers (ITE) *Trip Generation* 11th Edition was used to calculate the project trip estimates for the new land use at the project site. Trip generations estimates are shown in terms of daily traffic, as well as the AM and PM peak hours. The proposed Variety Retail Store falls under ITE Land Use Code 814 – Variety Store. The trip generation information for the proposed Variety Retail Store is shown in Table 1 below.

TABLE 1: Trip Generation
Variety Retail Store – ITE Land Use 814 – 10,640 SF
 Lake City, Florida

Period	ITE Rate	Units	Trips	Distribution		Trips		
				% In	% Out	In	Out	Net
Weekday	T = 63.66 (X)	10.64	677	50%	50%	339	338	677
AM Peak	T = 3.04 (X)	10.64	32	55%	45%	18	14	32
PM Peak	T = 6.70 (X)	10.64	71	51%	49%	36	35	71

Source: ITE 11th Edition of Trip Generation - Units: 1,000 square feet Gross Floor Area

The 2021 Pass-By Tables for ITE’s *Trip Generation* indicate a 34% pass-by rate for Land Use 814. This means that 34% of the trips generated are existing pass-by trips, and the net new trips represent 66% of the estimated *Trip Generation* number.

TABLE 2: Net Trip Generation with Pass-By Reduction

Period	Trips	Pass-By	Net Trips	Distribution		Net Trips		
				% In	% Out	In	Out	Net
Weekday	677	34%	447	50%	50%	224	224	447
AM Peak	32	34%	21	55%	45%	12	10	21
PM Peak	71	34%	47	51%	49%	24	23	47

The trip generation data is then used to develop the external distribution of project trips onto the adjacent roadway network from the project site. The next section of the report presents information on the trip distribution.

TRIP DISTRIBUTION

The distribution of project trips on the roadway network is a manual assignment derived from the AM and PM peak period traffic data collected on the adjacent roadway and a review of existing locations of interacting land-uses. The distribution is based on engineering judgment of the expected routes that patrons would take to / from the proposed development. The project has access just on SW Marvin Burnett Road. The AM and PM Peak Hour Project Trip Distribution is shown in **Figure 4** below.

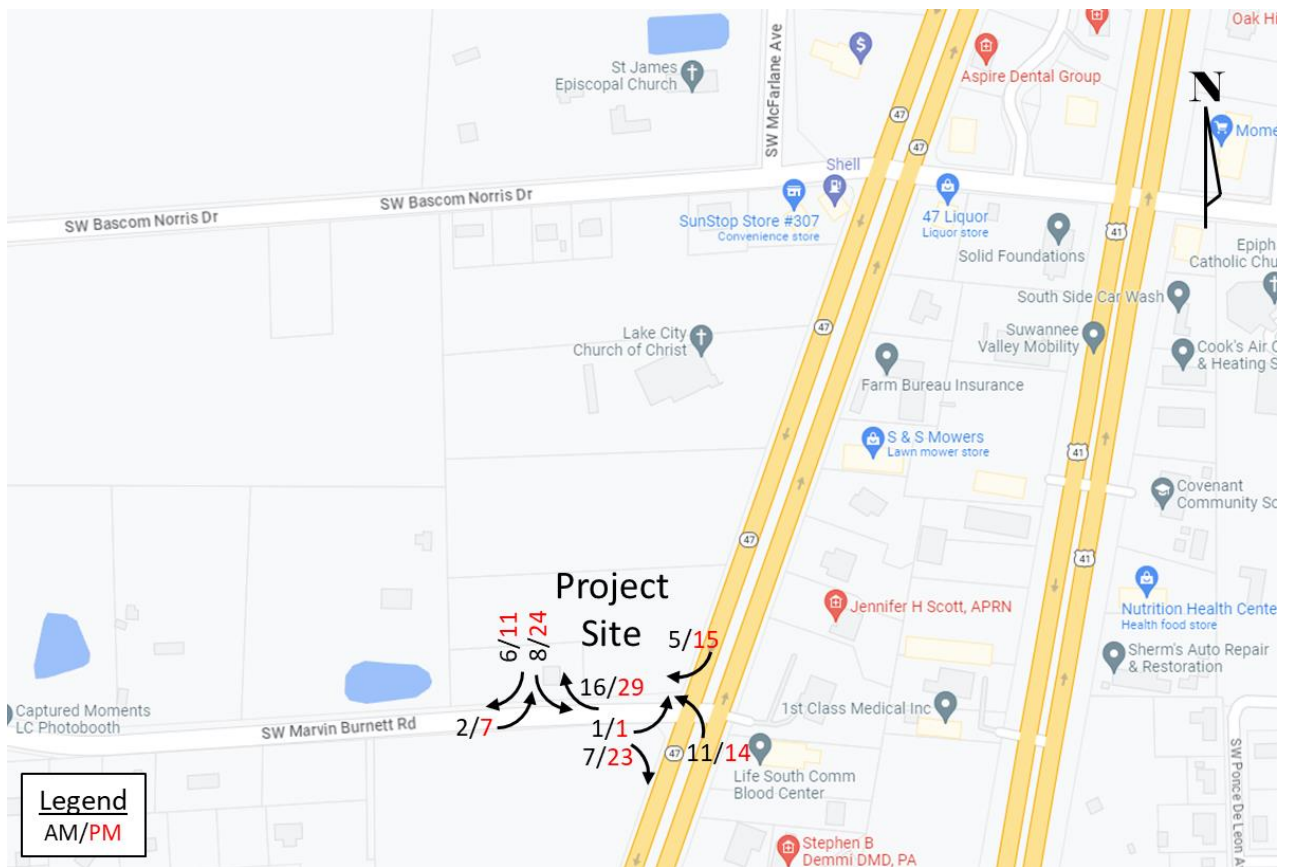


Figure 4 - Peak Hour Project Trip Distribution

LEFT TURN LANE ANALYSIS – Marvin Burnett Road

The criteria for evaluating left turn lanes are established in *NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide*. The highest left turning volume into the project site from Marvin Burnett Road is the PM Peak Hour left turn volume of 7 vehicles. The left + through + right turn volumes are added together to compute the “advancing volume.” The through + right turning volumes opposing the left turn are used as the “opposing volume.”

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

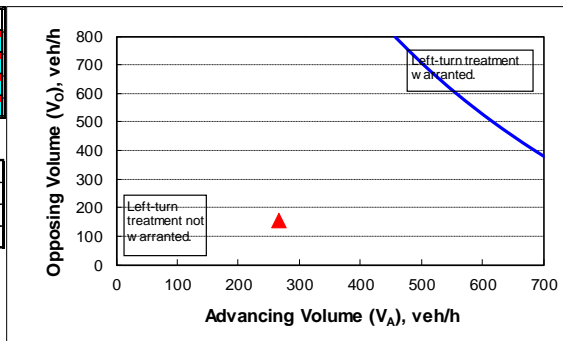
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	266
Opposing volume (V_O), veh/h:	156

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	898
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

RIGHT TURN LANE ANALYSIS – Marvin Barnett Road

Similarly, the criteria for evaluating right turn lanes are established in *NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide*. For this analysis, we need to enter the major road speed, the major road volume (through + right), and the right turn volume.

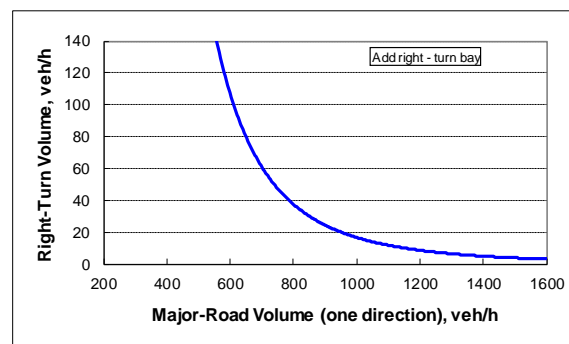
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	35
Major-road volume (one direction), veh/h:	156
Right-turn volume, veh/h:	29

OUTPUT

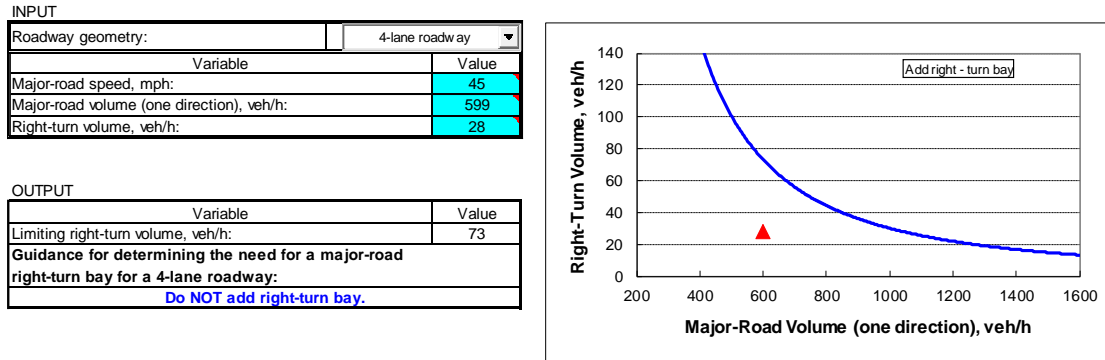
Variable	Value
Limiting right-turn volume, veh/h:	14198
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



RIGHT TURN LANE ANALYSIS – State Road 47

As indicated previously, the criteria for evaluating right turn lanes are established in *NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide*. For this analysis, we need to enter the major road speed, the major road volume (left + through + right), and the right turn volume.

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.



INTERSECTION LEVEL OF SERVICE (LOS) ANALYSIS

The roadway Level Of Service (LOS) analysis is conducted using the procedures outlined in the Transportation Research Board’s *Highway Capacity Manual* (HCM). The HCM procedures represent the state-of-the-practice for the analysis of transportation facilities.

Existing turning movement count data was collected on Tuesday, July 18, 2023 at the intersection of State Road 47 and SW Marvin Burnett Road. Two hours of turning movement count data were collected for both the AM peak period (7 AM to 9 AM) and the PM peak period (4 PM to 6 PM). Out of that two-hours of data collection in each period, the overall AM peak hour of 7:30 AM to 8:30 AM and the overall PM peak hour of 4:30 PM to 5:30 PM were used in the analysis. A seasonal adjustment of 1.02 is then applied based on FDOT Peak Season Factor Category Report for Columbia County (included in Appendix A). A growth factor of 3% is then added to the volumes to convert to 2024 (expected build-out year) volumes. The AM peak hour volumes along with the assigned new project trips are provided in **Table 3** below. The PM peak hour volumes along with the assigned new project trips are provided in **Table 4** below.

Table 3 – AM Peak Hour Volumes

Roadway	State Road 47						SW Marvin Burnett Road					
Approach	Northbound			Southbound			Eastbound			Westbound		
Movement	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt
2023	91	533	13	18	280	5	7	2	138	0	1	1
Seasonal	93	544	13	18	286	5	7	2	141	0	1	1
2024	96	560	14	19	294	5	7	2	145	0	1	1
Project	11	0	0	0	0	5	1	0	7	0	0	0
Total	107	560	14	19	294	10	8	2	152	0	1	1

Table 4 – PM Peak Hour Volumes

Roadway	State Road 47						SW Marvin Burnett Road					
Approach	Northbound			Southbound			Eastbound			Westbound		
Movement	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt
2023	132	433	2	6	565	13	4	0	255	6	0	2
Seasonal	135	442	2	6	576	13	4	0	260	6	0	2
2024	139	455	2	6	594	14	4	0	268	6	0	2
Project	14	0	0	0	0	15	1	0	23	0	0	0
Total	153	455	2	6	594	29	5	0	291	6	0	2

The Highway Capacity Software (HCS) Two-Way Stop-Controlled intersection module was utilized in analyzing the no-build and the build-out traffic volumes at the intersection of SR 47 and Marvin Burnett Road. The results from the HCS analyses are summarized in **Table 5** and **Table 6** below. The outputs from HCS are included in Appendix B.

Table 5 – Intersection Level Of Service (AM)

Roadway	State Road 47				SW Marvin Burnett Road			
Approach	Northbound		Southbound		Eastbound		Westbound	
MOE	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
No-Build	8.3	A	9.0	A	11.3	B	19.4	C
Build	8.3	A	9.0	A	11.5	B	20.1	C

Table 6 – Intersection Level Of Service (PM)

Roadway	State Road 47				SW Marvin Burnett Road			
Approach	Northbound		Southbound		Eastbound		Westbound	
MOE	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
No-Build	9.8	A	8.5	A	15.9	C	28.8	D
Build	10.0	B	8.5	A	17.2	C	35.0	E

The HCS analyses show that the impacts of the proposed variety retail store development on the operation of the intersection are minimal in the AM period. In the PM period, the westbound approach degrades from LOS D to LOS E, despite the fact that the project assigns no trips to the westbound approach. The westbound approach is a minor approach to the intersection and even in the LOS E scenario is operating at a volume to capacity ratio of 0.07 with an hourly flow rate of just nine vehicles. The HCS two-way stop-controlled analysis is well known for being overly pessimistic, and this is an example of that. An average delay of 35 seconds is not an intolerable scenario for those vehicles.

The City of Lake City requested that the intersection of SW Bascom Norris Drive and SW Marvin Burnett Road also be analyzed for this project. Existing turning movement count data was also collected on Tuesday, July 18, 2023 at this intersection. Two hours of turning movement count data were collected for both the AM peak period (7 AM to 9 AM) and the PM peak period (4 PM to 6 PM). Out of that two-hours of data collection in each period, the overall AM peak hour of 7:30 AM to 8:30 AM and the overall PM peak hour of 4:45 PM to 5:45 PM were used in the analysis. A seasonal adjustment of 1.02 is then applied based on FDOT Peak Season Factor Category Report for Columbia County. A growth factor of 3% is then added to the volumes to convert to 2024 (expected build-out year) volumes. The AM peak hour volumes along with the assigned new project trips are provided in **Table 7** below. The PM peak hour volumes along with the assigned new project trips are provided in **Table 8** below. For this analysis, a worst-case scenario where all of the project trips from the proposed retail site are presumed to make a northbound left at the intersection.

Table 7 – AM Peak Hour Volumes

Roadway	SW Marvin Burnett Road						SW Bascom Norris Drive					
	Northbound			Southbound			Eastbound			Westbound		
Movement	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt
2023	102	0	0	-	-	-	0	234	0	0	249	0
Seasonal	104	0	0	-	-	-	0	239	0	0	254	0
2024	107	0	0	-	-	-	0	246	0	0	262	0
Project	6	0	0	-	-	-	0	0	0	0	0	0
Total	113	0	0	-	-	-	0	246	0	0	262	0

Table 8 – PM Peak Hour Volumes

Roadway	SW Marvin Burnett Road						SW Bascom Norris Drive					
	Northbound			Southbound			Eastbound			Westbound		
Movement	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt
2023	145	0	2	-	-	-	0	205	0	0	422	0
Seasonal	148	0	2	-	-	-	0	209	0	0	430	0
2024	152	0	2	-	-	-	0	215	0	0	443	0
Project	11	0	0	-	-	-	0	0	0	0	0	0
Total	163	0	2	-	-	-	0	215	0	0	443	0

The intersection of Bascom Norris Drive and Marvin Burnett Road is a somewhat unusual T-intersection: Bascom Norris Drive is the major street that does not stop, and Marvin Burnett Road intersects and is controlled by a STOP sign. However, the left turn from Bascom Norris Drive WB onto Marvin Burnett Road is prohibited, and the right turn from Bascom Norris Drive EB onto Marvin Burnett Road is a free-flowing movement that is channelized and unimpeded. Thus, the only movement that has any control delay is the northbound left or right turn from Marvin Barnett Road onto Bascom Norris Drive. The layout of the intersection is shown in **Figure 5** below.



Figure 5 - SW Bascom Norris Dr & SW Marvin Burnett Rd

The results from the HCS analyses are summarized in **Table 9** and **Table 10** below. The outputs from HCS are included in Appendix B.

Table 9 – Intersection Level Of Service (AM)

Roadway	SW Marvin Burnett Road				SW Bascom Norris Drive			
Approach	Northbound		Southbound		Eastbound		Westbound	
MOE	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
No-Build	15.8	C	-	-	-	-	-	-
Build	16.1	C	-	-	-	-	-	-

Table 10 – Intersection Level Of Service (PM)

Roadway	SW Marvin Burnett Road				SW Bascom Norris Drive			
Approach	Northbound		Southbound		Eastbound		Westbound	
MOE	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
No-Build	24.6	C	-	-	-	-	-	-
Build	26.0	D	-	-	-	-	-	-

The HCS analyses show that the impact of the project traffic on the intersection of SW Marvin Burnett Road and SW Bascom Norris Drive is minimal. Although in the PM period the LOS does go from C to D, it is only an increase of 1.4 seconds of delay per vehicle. This movement operates with a volume to capacity ratio of just 0.54 in the PM period with the project traffic.

CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing data and analysis provided, the following conclusions and recommendations are offered:

Conclusions:

- The proposed variety retail store is estimated to generate 32 trips in the AM Peak Hour and 71 trips in the PM Peak Hour. To be conservative in the analyses, these numbers were used. If the pass-by reductions from ITE are used, the net trips would be 21 in the AM Peak Hour and 47 in the PM Peak Hour.
- The additional traffic generated by the proposed variety retail store will not have a noticeable impact on the adjoining STOP-controlled intersections and will not degrade the performance of the transportation network.
- Neither left-turn lanes nor right-turn lanes are warranted on either State Road 47 or on SW Marvin Burnett Road. There is very little disruption to traffic with the addition of the project driveways and the generated project traffic.

Recommendations:

- Approve the project for construction and approve the associated driveway connection onto SW Marvin Burnett Road.

APPENDIX A: TURNING MOVEMENT COUNTS

SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

Leg Direction	Marvin Burnett Road Eastbound					Radiation Oncology Grp Westbound					SR 47 Northbound					SR 47 Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-07-18 7:00AM	0	0	17	0	17	0	0	0	0	0	13	91	2	0	106	0	58	1	1	60	183
7:15AM	1	0	16	0	17	0	0	0	0	0	16	140	2	0	158	0	42	0	0	42	217
7:30AM	2	0	34	0	36	0	0	0	0	0	20	163	3	0	186	2	63	1	4	70	292
7:45AM	0	0	35	0	35	0	1	0	0	1	27	150	3	0	180	1	82	2	4	89	305
Hourly Total	3	0	102	0	105	0	1	0	0	1	76	544	10	0	630	3	245	4	9	261	997
8:00AM	2	0	31	0	33	0	0	1	0	1	23	121	5	0	149	0	63	2	4	69	252
8:15AM	3	2	38	0	43	0	0	0	0	0	20	99	2	1	122	1	72	0	2	75	240
8:30AM	0	1	33	0	34	0	1	2	0	3	28	117	1	0	146	0	54	1	2	57	240
8:45AM	3	0	40	1	44	0	0	2	0	2	32	137	1	0	170	1	65	0	2	68	284
Hourly Total	8	3	142	1	154	0	1	5	0	6	103	474	9	1	587	2	254	3	10	269	1016
4:00PM	2	0	51	0	53	1	0	0	0	1	33	90	0	1	124	0	124	3	2	129	307
4:15PM	3	0	71	0	74	1	1	0	0	2	27	92	0	1	120	0	103	3	1	107	303
4:30PM	1	0	64	0	65	3	0	0	0	3	21	117	1	1	140	0	141	3	4	148	356
4:45PM	0	0	67	0	67	0	0	1	0	1	35	96	0	3	134	0	137	0	1	138	340
Hourly Total	6	0	253	0	259	5	1	1	0	7	116	395	1	6	518	0	505	9	8	522	1306
5:00PM	1	0	63	0	64	3	0	0	0	3	36	133	1	9	179	0	147	7	0	154	400
5:15PM	2	0	61	0	63	0	0	1	0	1	21	97	0	6	124	0	140	3	1	144	332
5:30PM	2	0	66	1	69	3	0	0	0	3	36	88	0	6	130	1	148	4	1	154	356
5:45PM	0	0	79	0	79	0	0	0	0	0	24	76	1	1	102	0	99	1	1	101	282
Hourly Total	5	0	269	1	275	6	0	1	0	7	117	394	2	22	535	1	534	15	3	553	1370
Total	22	3	766	2	793	11	3	7	0	21	412	1807	22	29	2270	6	1538	31	30	1605	4689
% Approach	2.8%	0.4%	96.6%	0.3%	-	52.4%	14.3%	33.3%	0%	-	18.1%	79.6%	1.0%	1.3%	-	0.4%	95.8%	1.9%	1.9%	-	-
% Total	0.5%	0.1%	16.3%	0%	16.9%	0.2%	0.1%	0.1%	0%	0.4%	8.8%	38.5%	0.5%	0.6%	48.4%	0.1%	32.8%	0.7%	0.6%	34.2%	-
Lights and Motorcycles	21	3	759	2	785	11	2	7	0	20	410	1743	22	28	2203	6	1489	28	29	1552	4560
% Lights and Motorcycles	95.5%	100%	99.1%	100%	99.0%	100%	66.7%	100%	0%	95.2%	99.5%	96.5%	100%	96.6%	97.0%	100%	96.8%	90.3%	96.7%	96.7%	97.2%
Heavy	1	0	7	0	8	0	1	0	0	1	2	64	0	1	67	0	49	3	1	53	129
% Heavy	4.5%	0%	0.9%	0%	1.0%	0%	33.3%	0%	0%	4.8%	0.5%	3.5%	0%	3.4%	3.0%	0%	3.2%	9.7%	3.3%	3.3%	2.8%

* L: Left, R: Right, T: Thru, U: U-Turn

SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

[N] SR 47

Total: 3471

In: 1605

Out: 1866

31
1538
6
30

[W] Marvin Burnett Road

Total: 1241

In: 793

Out: 448

22
3
766

7
11

Out: 31

In: 21

Total: 52

[E] Radiation Oncology Grp

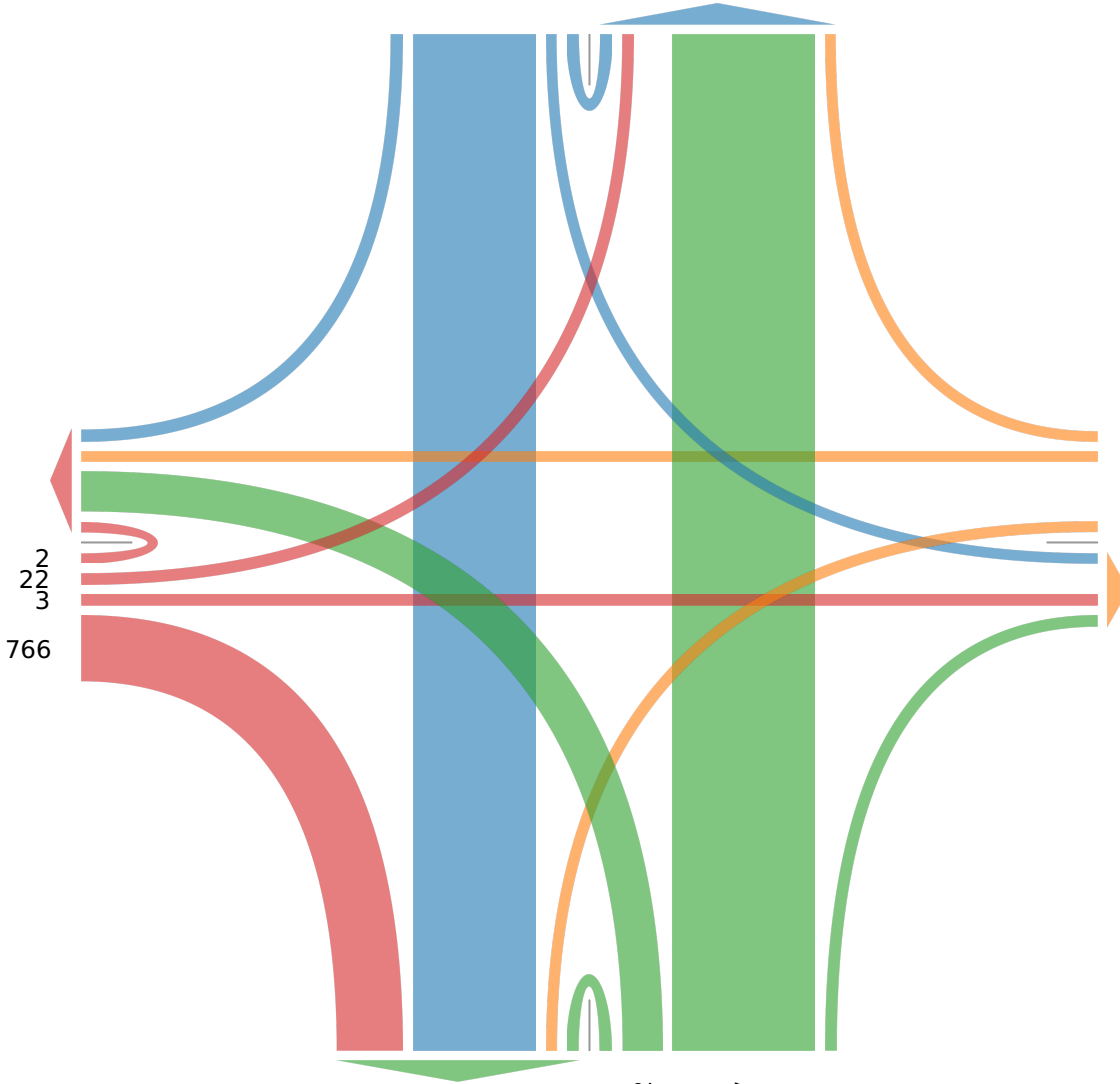
Out: 2344

In: 2270

Total: 4614

[S] SR 47

29
412
1807
22



SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

Leg Direction	Marvin Burnett Road Eastbound					Radiation Oncology Grp Westbound					SR 47 Northbound					SR 47 Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-07-18 7:30AM	2	0	34	0	36	0	0	0	0	0	20	163	3	0	186	2	63	1	4	70	292
7:45AM	0	0	35	0	35	0	1	0	0	1	27	150	3	0	180	1	82	2	4	89	305
8:00AM	2	0	31	0	33	0	0	1	0	1	23	121	5	0	149	0	63	2	4	69	252
8:15AM	3	2	38	0	43	0	0	0	0	0	20	99	2	1	122	1	72	0	2	75	240
Total	7	2	138	0	147	0	1	1	0	2	90	533	13	1	637	4	280	5	14	303	1089
% Approach	4.8%	1.4%	93.9%	0%	-	0%	50.0%	50.0%	0%	-	14.1%	83.7%	2.0%	0.2%	-	1.3%	92.4%	1.7%	4.6%	-	-
% Total	0.6%	0.2%	12.7%	0%	13.5%	0%	0.1%	0.1%	0%	0.2%	8.3%	48.9%	1.2%	0.1%	58.5%	0.4%	25.7%	0.5%	1.3%	27.8%	-
PHF	0.583	0.250	0.908	-	0.855	-	0.250	0.250	-	0.500	0.833	0.817	0.650	0.250	0.856	0.500	0.854	0.625	0.875	0.851	0.893
Lights and Motorcycles	7	2	137	0	146	0	0	1	0	1	89	515	13	1	618	4	272	3	13	292	1057
% Lights and Motorcycles	100%	100%	99.3%	0%	99.3%	0%	0%	100%	0%	50.0%	98.9%	96.6%	100%	100%	97.0%	100%	97.1%	60.0%	92.9%	96.4%	97.1%
Heavy	0	0	1	0	1	0	1	0	0	1	1	18	0	0	19	0	8	2	1	11	32
% Heavy	0%	0%	0.7%	0%	0.7%	0%	100%	0%	0%	50.0%	1.1%	3.4%	0%	0%	3.0%	0%	2.9%	40.0%	7.1%	3.6%	2.9%

*L: Left, R: Right, T: Thru, U: U-Turn

SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

[N] SR 47

Total: 858

In: 303

Out: 555

5 280 4 14

[W] Marvin Burnett Road

Total: 243
In: 147 Out: 96

7 2 138

[E] Radiation Oncology Grp

Out: 19 In: 2
Total: 21

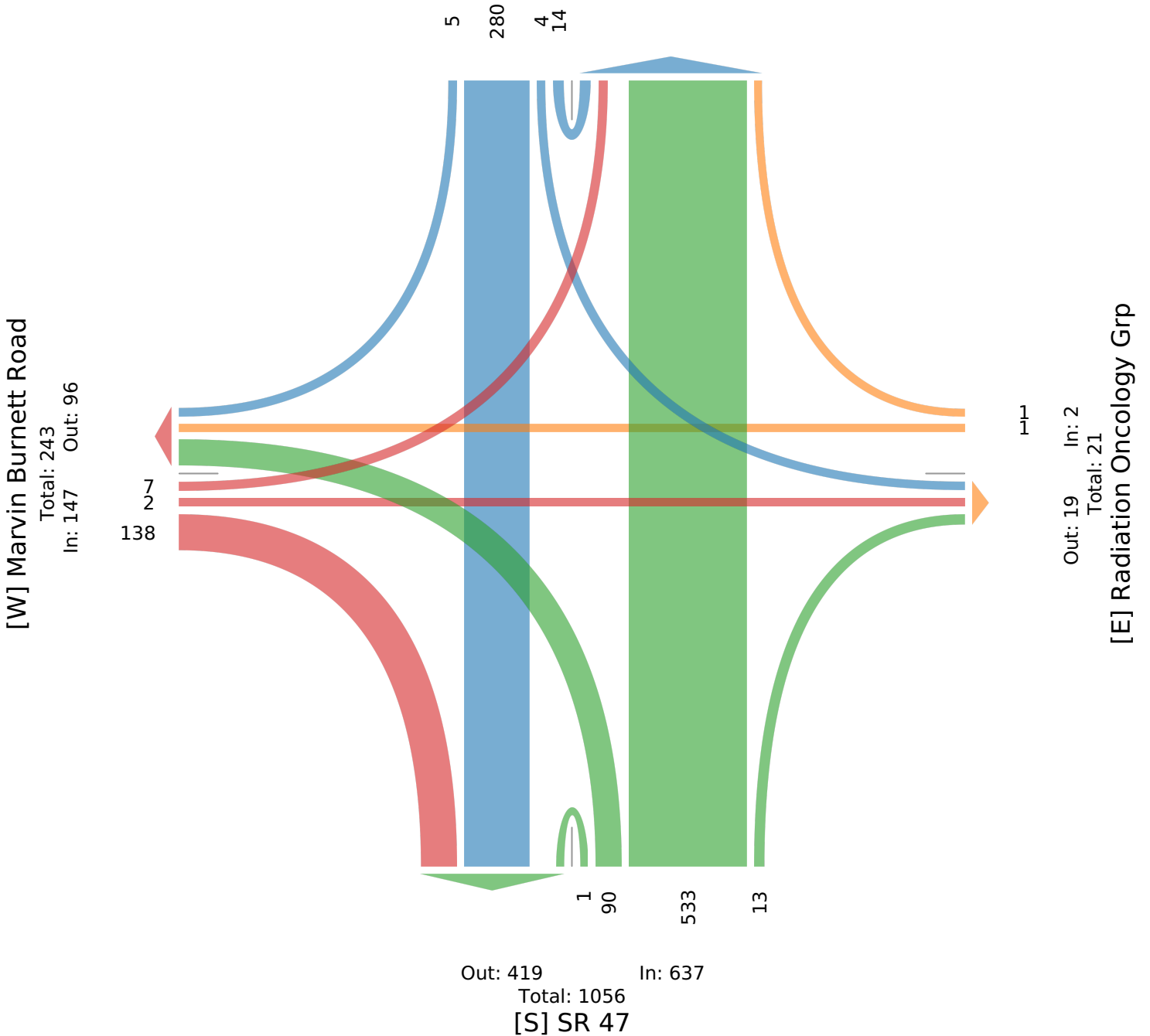
Out: 419

In: 637

Total: 1056

[S] SR 47

1 90 533 13



SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

Leg Direction	Marvin Burnett Road Eastbound					Radiation Oncology Grp Westbound					SR 47 Northbound					SR 47 Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-07-18 4:30PM	1	0	64	0	65	3	0	0	0	3	21	117	1	1	140	0	141	3	4	148	356
4:45PM	0	0	67	0	67	0	0	1	0	1	35	96	0	3	134	0	137	0	1	138	340
5:00PM	1	0	63	0	64	3	0	0	0	3	36	133	1	9	179	0	147	7	0	154	400
5:15PM	2	0	61	0	63	0	0	1	0	1	21	97	0	6	124	0	140	3	1	144	332
Total	4	0	255	0	259	6	0	2	0	8	113	443	2	19	577	0	565	13	6	584	1428
% Approach	1.5%	0%	98.5%	0%	-	75.0%	0%	25.0%	0%	-	19.6%	76.8%	0.3%	3.3%	-	0%	96.7%	2.2%	1.0%	-	-
% Total	0.3%	0%	17.9%	0%	18.1%	0.4%	0%	0.1%	0%	0.6%	7.9%	31.0%	0.1%	1.3%	40.4%	0%	39.6%	0.9%	0.4%	40.9%	-
PHF	0.500	-	0.951	-	0.966	0.500	-	0.500	-	0.667	0.785	0.833	0.500	0.528	0.806	-	0.961	0.464	0.375	0.948	0.893
Lights and Motorcycles	3	0	253	0	256	6	0	2	0	8	113	430	2	18	563	0	549	12	6	567	1394
% Lights and Motorcycles	75.0%	0%	99.2%	0%	98.8%	100%	0%	100%	0%	100%	100%	97.1%	100%	94.7%	97.6%	0%	97.2%	92.3%	100%	97.1%	97.6%
Heavy	1	0	2	0	3	0	0	0	0	0	0	13	0	1	14	0	16	1	0	17	34
% Heavy	25.0%	0%	0.8%	0%	1.2%	0%	0%	0%	0%	0%	0%	2.9%	0%	5.3%	2.4%	0%	2.8%	7.7%	0%	2.9%	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

SR 47 & SW Marvin Burnett - TMC

Tue Jul 18, 2023

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091860, Location: 30.160196, -82.645384, Site Code: SR 47 & Marvin Burnett



Provided by: Hagen Consulting Services
361 Strawder Road, Ray City, GA, 31645, US

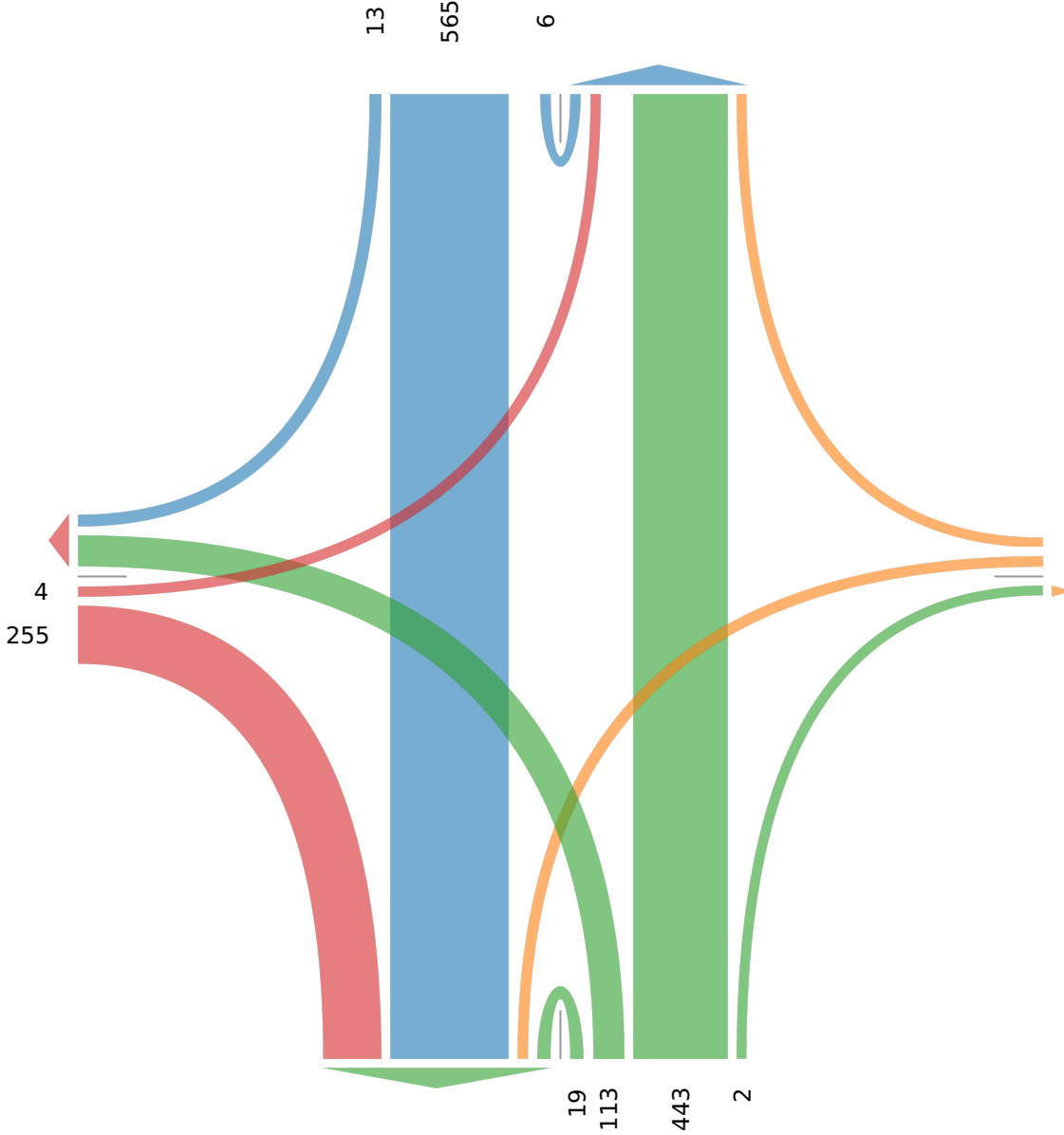
[N] SR 47

Total: 1039

In: 584 Out: 455

[W] Marvin Burnett Road

Total: 385
In: 259 Out: 126



622

Out: 2 In: 8
Total: 10

[E] Radiation Oncology Grp

Out: 845 In: 577

Total: 1422

[S] SR 47

Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US

Leg Direction	SW Bascom Norris Dr Eastbound				SW Bascom Norris Dr Westbound				SW Marvin Burnett Rd Northbound				
Time	T	R	U	App	L	T	U	App	L	R	U	App	Int
2023-07-18 7:00AM	33	0	0	33	0	27	0	27	16	0	0	16	76
7:15AM	31	0	0	31	0	48	0	48	16	0	0	16	95
7:30AM	59	0	0	59	0	63	0	63	21	0	0	21	143
7:45AM	78	0	0	78	0	63	0	63	34	0	0	34	175
Hourly Total	201	0	0	201	0	201	0	201	87	0	0	87	489
8:00AM	41	0	0	41	0	58	0	58	24	0	0	24	123
8:15AM	56	0	0	56	0	65	0	65	23	0	0	23	144
8:30AM	49	0	0	49	0	57	0	57	26	0	0	26	132
8:45AM	41	0	0	41	0	74	0	74	38	0	0	38	153
Hourly Total	187	0	0	187	0	254	0	254	111	0	0	111	552
4:00PM	43	0	0	43	0	103	0	103	36	0	0	36	182
4:15PM	52	0	0	52	0	107	0	107	38	0	0	38	197
4:30PM	48	0	0	48	0	97	0	97	20	0	0	20	165
4:45PM	48	0	0	48	0	95	0	95	32	0	0	32	175
Hourly Total	191	0	0	191	0	402	0	402	126	0	0	126	719
5:00PM	52	0	0	52	0	142	0	142	35	0	0	35	229
5:15PM	58	0	0	58	0	98	0	98	22	1	0	23	179
5:30PM	47	0	0	47	0	87	0	87	56	1	0	57	191
5:45PM	44	0	0	44	0	62	0	62	29	0	0	29	135
Hourly Total	201	0	0	201	0	389	0	389	142	2	0	144	734
Total	780	0	0	780	0	1246	0	1246	466	2	0	468	2494
% Approach	100%	0%	0%	-	0%	100%	0%	-	99.6%	0.4%	0%	-	-
% Total	31.3%	0%	0%	31.3%	0%	50.0%	0%	50.0%	18.7%	0.1%	0%	18.8%	-
Lights and Motorcycles	759	0	0	759	0	1221	0	1221	461	2	0	463	2443
% Lights and Motorcycles	97.3%	0%	0%	97.3%	0%	98.0%	0%	98.0%	98.9%	100%	0%	98.9%	98.0%
Heavy	21	0	0	21	0	25	0	25	5	0	0	5	51
% Heavy	2.7%	0%	0%	2.7%	0%	2.0%	0%	2.0%	1.1%	0%	0%	1.1%	2.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

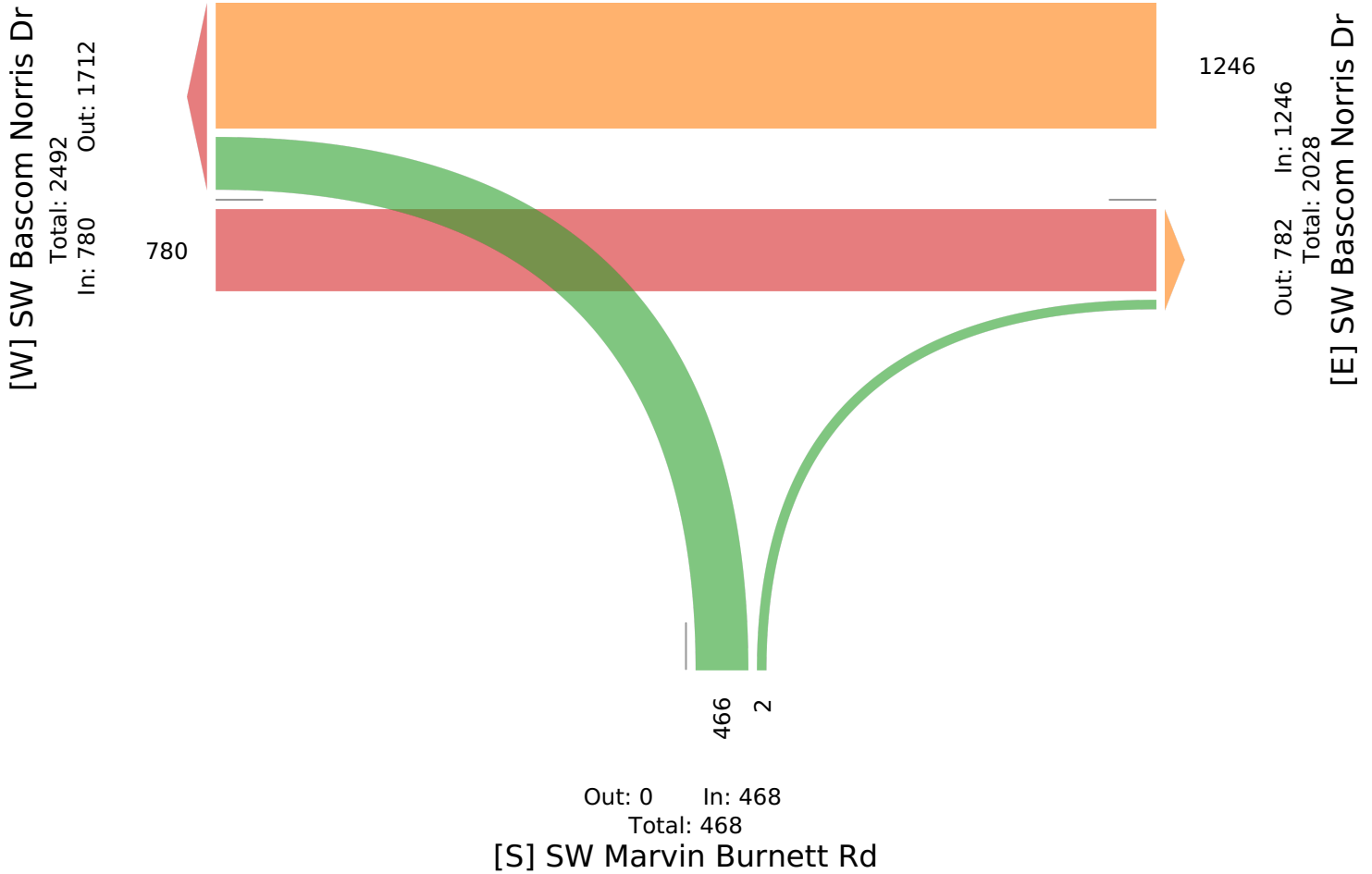
All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US



Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US

Leg Direction	SW Bascom Norris Dr Eastbound				SW Bascom Norris Dr Westbound				SW Marvin Burnett Rd Northbound				
Time	T	R	U	App	L	T	U	App	L	R	U	App	Int
2023-07-18 7:30AM	59	0	0	59	0	63	0	63	21	0	0	21	143
7:45AM	78	0	0	78	0	63	0	63	34	0	0	34	175
8:00AM	41	0	0	41	0	58	0	58	24	0	0	24	123
8:15AM	56	0	0	56	0	65	0	65	23	0	0	23	144
Total	234	0	0	234	0	249	0	249	102	0	0	102	585
% Approach	100%	0%	0%	-	0%	100%	0%	-	100%	0%	0%	-	-
% Total	40.0%	0%	0%	40.0%	0%	42.6%	0%	42.6%	17.4%	0%	0%	17.4%	-
PHF	0.750	-	-	0.750	-	0.958	-	0.958	0.750	-	-	0.750	0.836
Lights and Motorcycles	222	0	0	222	0	240	0	240	99	0	0	99	561
% Lights and Motorcycles	94.9%	0%	0%	94.9%	0%	96.4%	0%	96.4%	97.1%	0%	0%	97.1%	95.9%
Heavy	12	0	0	12	0	9	0	9	3	0	0	3	24
% Heavy	5.1%	0%	0%	5.1%	0%	3.6%	0%	3.6%	2.9%	0%	0%	2.9%	4.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

AM Peak (7:30 AM - 8:30 AM)

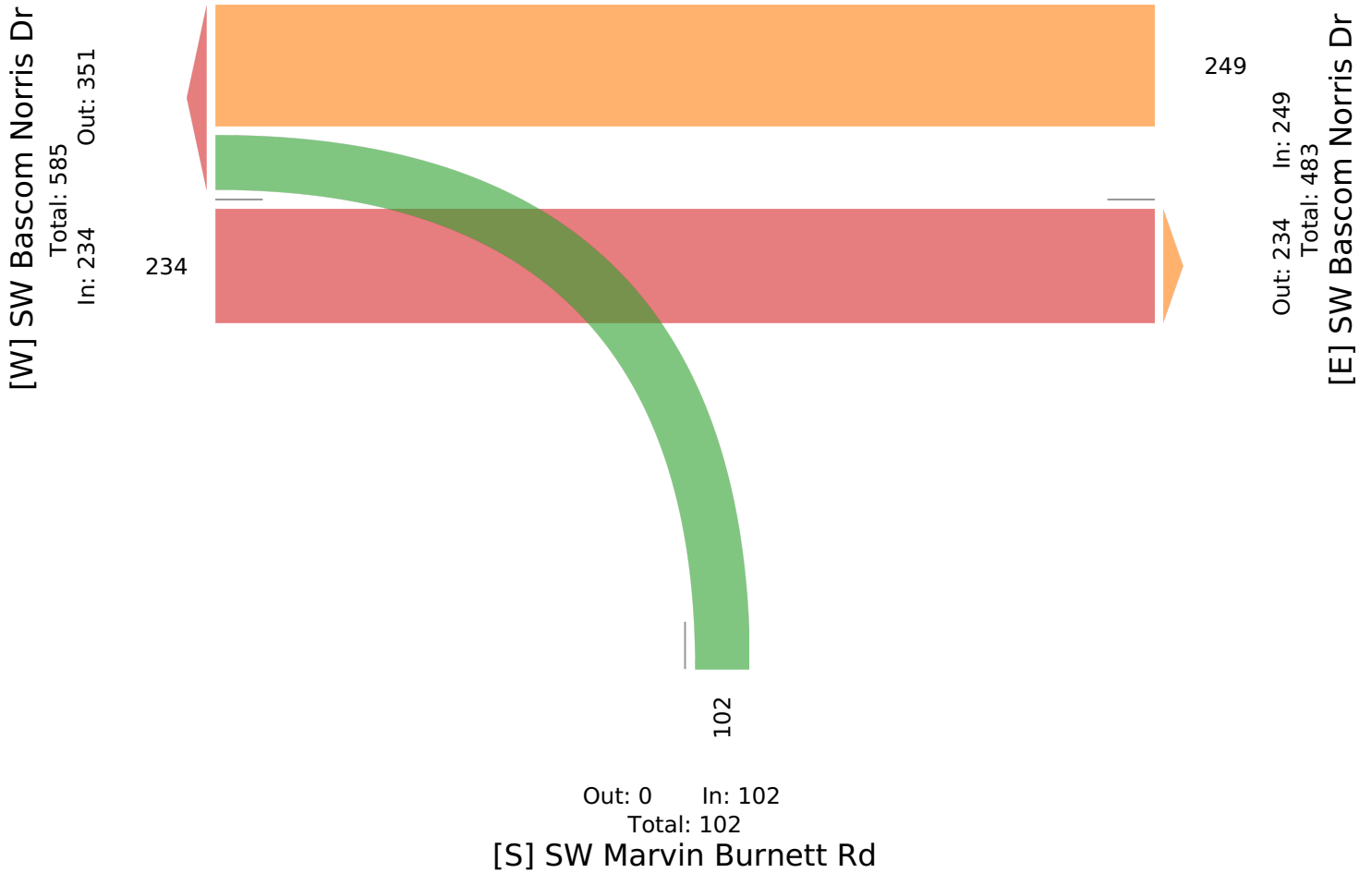
All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US



Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US

Leg Direction	SW Bascom Norris Dr Eastbound				SW Bascom Norris Dr Westbound				SW Marvin Burnett Rd Northbound				
Time	T	R	U	App	L	T	U	App	L	R	U	App	Int
2023-07-18 4:45PM	48	0	0	48	0	95	0	95	32	0	0	32	175
5:00PM	52	0	0	52	0	142	0	142	35	0	0	35	229
5:15PM	58	0	0	58	0	98	0	98	22	1	0	23	179
5:30PM	47	0	0	47	0	87	0	87	56	1	0	57	191
Total	205	0	0	205	0	422	0	422	145	2	0	147	774
% Approach	100%	0%	0%	-	0%	100%	0%	-	98.6%	1.4%	0%	-	-
% Total	26.5%	0%	0%	26.5%	0%	54.5%	0%	54.5%	18.7%	0.3%	0%	19.0%	-
PHF	0.884	-	-	0.884	-	0.743	-	0.743	0.647	0.500	-	0.645	0.845
Lights and Motorcycles	204	0	0	204	0	416	0	416	144	2	0	146	766
% Lights and Motorcycles	99.5%	0%	0%	99.5%	0%	98.6%	0%	98.6%	99.3%	100%	0%	99.3%	99.0%
Heavy	1	0	0	1	0	6	0	6	1	0	0	1	8
% Heavy	0.5%	0%	0%	0.5%	0%	1.4%	0%	1.4%	0.7%	0%	0%	0.7%	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Marvin Burnett & Bascom Norris - TMC

Tue Jul 18, 2023

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

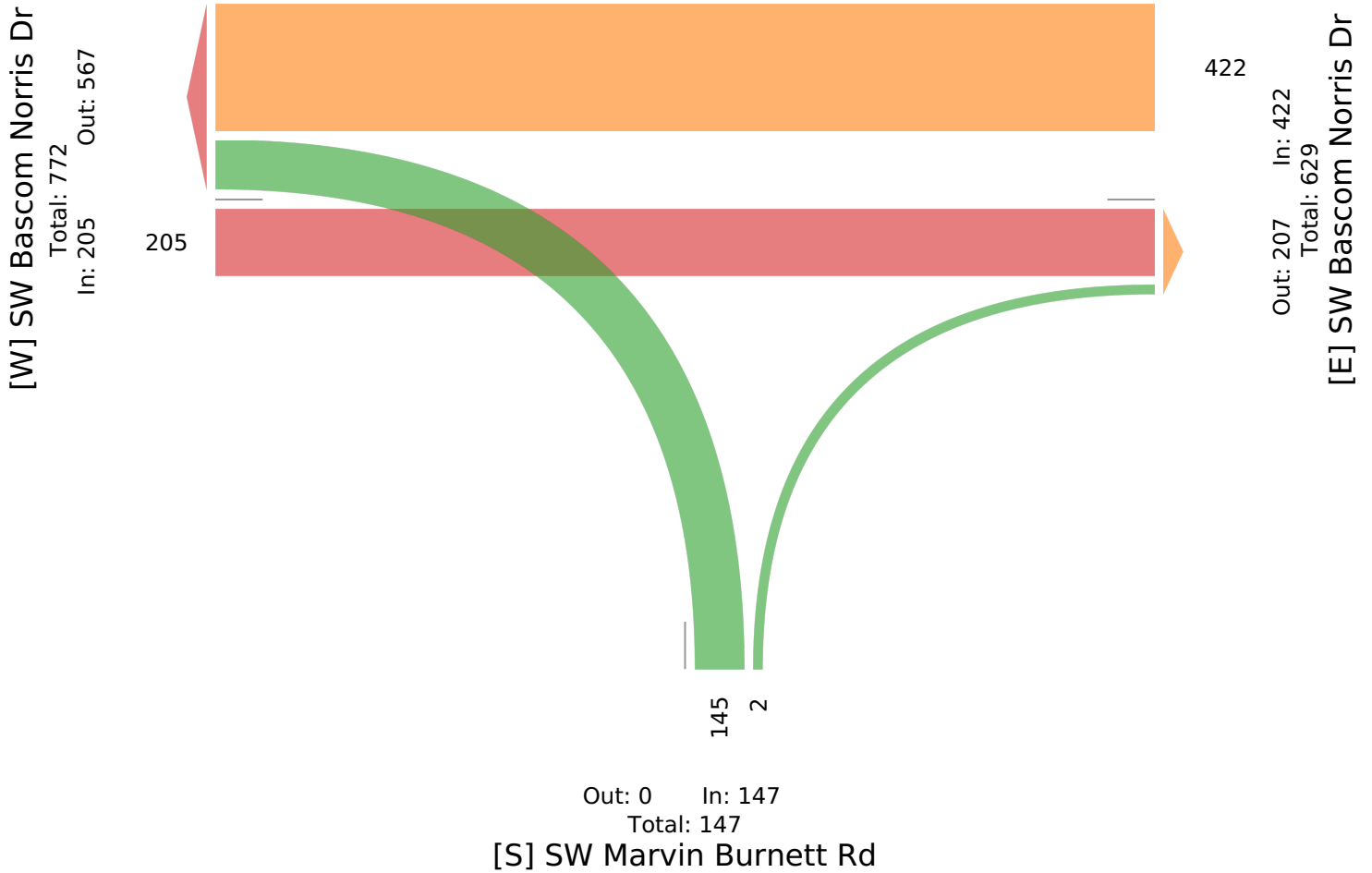
All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1091861, Location: 30.163397, -82.655082, Site Code: Marvin Burnett & Bascom Norris



Provided by: Hagen Consulting Services
361 Strawder Road,
Ray City, GA, 31645, US



2022 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 2900 COLUMBIA COUNTYWIDE

WEEK	DATES	SF	MOCF: 0.98 PSCF
1	01/01/2022 - 01/01/2022	1.02	1.04
2	01/02/2022 - 01/08/2022	1.05	1.07
3	01/09/2022 - 01/15/2022	1.08	1.10
4	01/16/2022 - 01/22/2022	1.07	1.09
5	01/23/2022 - 01/29/2022	1.05	1.07
6	01/30/2022 - 02/05/2022	1.03	1.05
7	02/06/2022 - 02/12/2022	1.02	1.04
8	02/13/2022 - 02/19/2022	1.00	1.02
9	02/20/2022 - 02/26/2022	1.00	1.02
10	02/27/2022 - 03/05/2022	0.99	1.01
11	03/06/2022 - 03/12/2022	0.99	1.01
*12	03/13/2022 - 03/19/2022	0.98	1.00
*13	03/20/2022 - 03/26/2022	0.98	1.00
*14	03/27/2022 - 04/02/2022	0.98	1.00
*15	04/03/2022 - 04/09/2022	0.97	0.99
*16	04/10/2022 - 04/16/2022	0.97	0.99
*17	04/17/2022 - 04/23/2022	0.97	0.99
*18	04/24/2022 - 04/30/2022	0.97	0.99
*19	05/01/2022 - 05/07/2022	0.97	0.99
*20	05/08/2022 - 05/14/2022	0.97	0.99
*21	05/15/2022 - 05/21/2022	0.98	1.00
*22	05/22/2022 - 05/28/2022	0.98	1.00
*23	05/29/2022 - 06/04/2022	0.99	1.01
*24	06/05/2022 - 06/11/2022	0.99	1.01
25	06/12/2022 - 06/18/2022	1.00	1.02
26	06/19/2022 - 06/25/2022	1.00	1.02
27	06/26/2022 - 07/02/2022	1.01	1.03
28	07/03/2022 - 07/09/2022	1.02	1.04
29	07/10/2022 - 07/16/2022	1.03	1.05
30	07/17/2022 - 07/23/2022	1.02	1.04
31	07/24/2022 - 07/30/2022	1.01	1.03
32	07/31/2022 - 08/06/2022	1.01	1.03
33	08/07/2022 - 08/13/2022	1.00	1.02
34	08/14/2022 - 08/20/2022	0.99	1.01
35	08/21/2022 - 08/27/2022	1.00	1.02
36	08/28/2022 - 09/03/2022	1.00	1.02
37	09/04/2022 - 09/10/2022	1.01	1.03
38	09/11/2022 - 09/17/2022	1.01	1.03
39	09/18/2022 - 09/24/2022	1.00	1.02
40	09/25/2022 - 10/01/2022	0.99	1.01
41	10/02/2022 - 10/08/2022	0.98	1.00
42	10/09/2022 - 10/15/2022	0.97	0.99
43	10/16/2022 - 10/22/2022	0.98	1.00
44	10/23/2022 - 10/29/2022	0.99	1.01
45	10/30/2022 - 11/05/2022	1.00	1.02
46	11/06/2022 - 11/12/2022	1.01	1.03
47	11/13/2022 - 11/19/2022	1.02	1.04
48	11/20/2022 - 11/26/2022	1.02	1.04
49	11/27/2022 - 12/03/2022	1.02	1.04
50	12/04/2022 - 12/10/2022	1.02	1.04
51	12/11/2022 - 12/17/2022	1.02	1.04
52	12/18/2022 - 12/24/2022	1.05	1.07
53	12/25/2022 - 12/31/2022	1.08	1.10

* PEAK SEASON

23-FEB-2023 09:11:19

830UPD

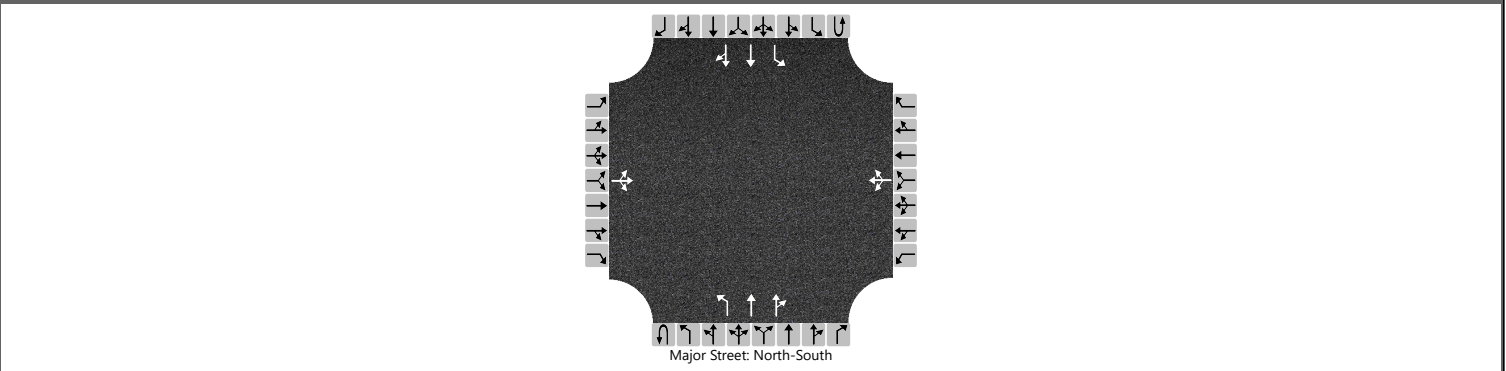
2_2900_PKSEASON.TXT

APPENDIX B: HIGHWAY CAPACITY ANALYSES

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	L. Hagen			Intersection	SR 47 & Marvin Burnett Road		
Agency/Co.	Hagen Consulting Services			Jurisdiction	Columbia County		
Date Performed	10/2/2023			East/West Street	SW Marvin Burnett Road		
Analysis Year	2024			North/South Street	SR 47		
Time Analyzed	AM Peak Period			Peak Hour Factor	0.89		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	No-build scenario						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		1	2	0		1	2	0	
Configuration			LTR				LTR			L	T	TR		L	T	TR	
Volume (veh/h)		7	2	145		0	1	1		96	560	14		0	19	294	5
Percent Heavy Vehicles (%)		3	3	3		3	3	3		3	3			3	3		
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage		Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2			
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23			

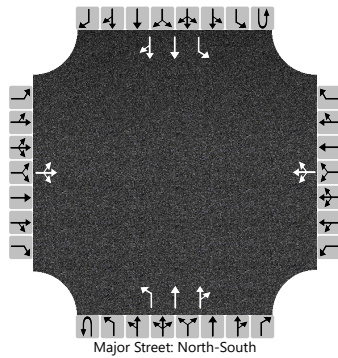
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			173				2			108				21			
Capacity, c (veh/h)			743				252			1213				929			
v/c Ratio			0.23				0.01			0.09				0.02			
95% Queue Length, Q ₉₅ (veh)			0.9				0.0			0.3				0.1			
Control Delay (s/veh)			11.3				19.4			8.3				9.0			
Level of Service (LOS)			B				C			A				A			
Approach Delay (s/veh)		11.3				19.4				1.2				0.5			
Approach LOS		B				C				A				A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	L. Hagen			Intersection	SR 47 & Marvin Burnett Road		
Agency/Co.	Hagen Consulting Services			Jurisdiction	Columbia County		
Date Performed	10/2/2023			East/West Street	SW Marvin Burnett Road		
Analysis Year	2024			North/South Street	SR 47		
Time Analyzed	AM Peak Period			Peak Hour Factor	0.89		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build scenario						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0	
Configuration			LTR				LTR			L	T	TR		L	T	TR	
Volume (veh/h)		8	2	152		0	1	1	0	107	560	14	0	19	294	10	
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage		Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

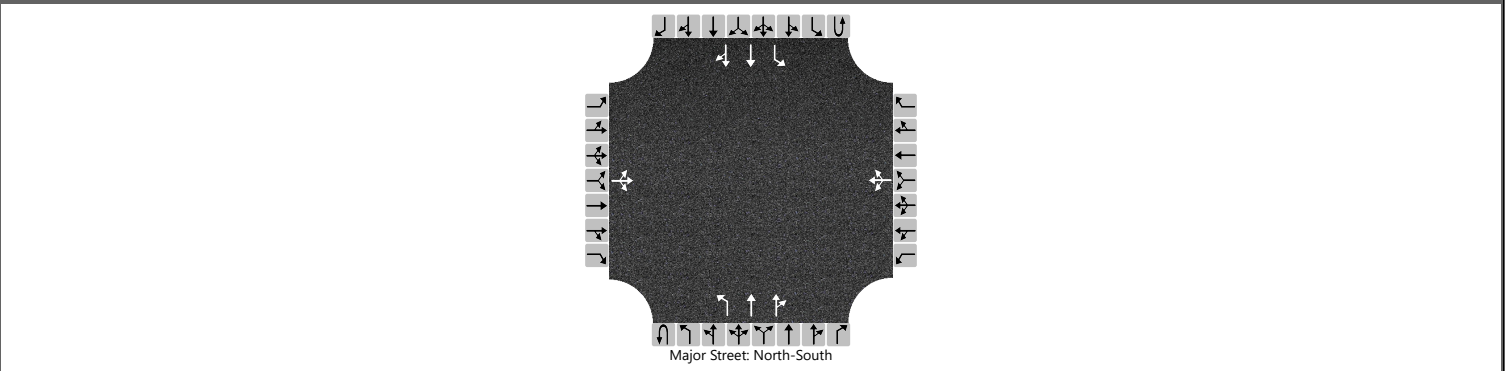
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			182				2			120				21			
Capacity, c (veh/h)			732				241			1207				929			
v/c Ratio			0.25				0.01			0.10				0.02			
95% Queue Length, Q ₉₅ (veh)			1.0				0.0			0.3				0.1			
Control Delay (s/veh)			11.5				20.1			8.3				9.0			
Level of Service (LOS)			B				C			A				A			
Approach Delay (s/veh)		11.5				20.1				1.3				0.5			
Approach LOS		B				C				A				A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	L. Hagen	Intersection	SR 47 & Marvin Burnett Road				
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County				
Date Performed	10/2/2023	East/West Street	SW Marvin Burnett Road				
Analysis Year	2024	North/South Street	SR 47				
Time Analyzed	PM Peak Period	Peak Hour Factor	0.89				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	No-build scenario						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound					
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		
Movement																		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	1	0		0	1	2	0		0	1	2	0
Configuration			LTR				LTR			L	T	TR			L	T	TR	
Volume (veh/h)		4	0	268		6	0	2		0	139	455	2		0	6	594	14
Percent Heavy Vehicles (%)		3	3	3		3	3	3		3	3				3	3		
Proportion Time Blocked																		
Percent Grade (%)	0				0													
Right Turn Channelized																		
Median Type Storage	Left Only								1									

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1					4.1			
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16					4.16			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2					2.2			
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23					2.23			

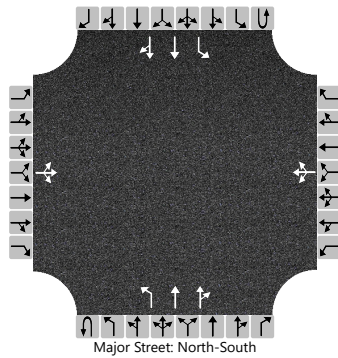
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			306				9				156				7		
Capacity, c (veh/h)			634				160				899				1041		
v/c Ratio			0.48				0.06				0.17				0.01		
95% Queue Length, Q ₉₅ (veh)			2.6				0.2				0.6				0.0		
Control Delay (s/veh)			15.9				28.8				9.8				8.5		
Level of Service (LOS)			C				D				A				A		
Approach Delay (s/veh)	15.9				28.8				2.3				0.1				
Approach LOS	C				D				A				A				

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	L. Hagen	Intersection	SR 47 & Marvin Burnett Road
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County
Date Performed	10/2/2023	East/West Street	SW Marvin Burnett Road
Analysis Year	2024	North/South Street	SR 47
Time Analyzed	PM Peak Period	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Build scenario		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0	
Configuration			LTR				LTR			L	T	TR		L	T	TR	
Volume (veh/h)		5	0	291		6	0	2	0	153	455	2	0	6	594	29	
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage		Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

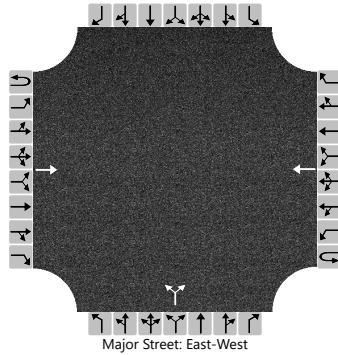
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			333				9			172				7			
Capacity, c (veh/h)			622				129			886				1041			
v/c Ratio			0.53				0.07			0.19				0.01			
95% Queue Length, Q ₉₅ (veh)			3.2				0.2			0.7				0.0			
Control Delay (s/veh)			17.2				35.0			10.0				8.5			
Level of Service (LOS)			C				E			B				A			
Approach Delay (s/veh)		17.2				35.0				2.5				0.1			
Approach LOS		C				E				A				A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	L. Hagen	Intersection	Bascom Norris & Marvin Burnett
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County
Date Performed	10/2/2023	East/West Street	Bascom Norris Drive
Analysis Year	2024	North/South Street	Marvin Burnett Road
Time Analyzed	AM Peak	Peak Hour Factor	0.84
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	No-build scenario		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration			T				T			LR						
Volume (veh/h)			246				262			107		0				
Percent Heavy Vehicles (%)										3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.23				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.33				

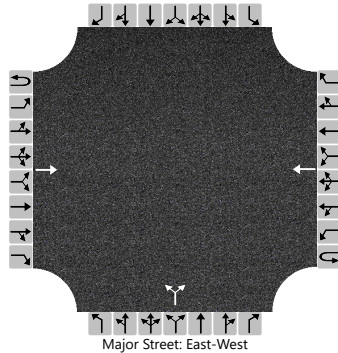
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										127						
Capacity, c (veh/h)										459						
v/c Ratio										0.28						
95% Queue Length, Q ₉₅ (veh)										1.1						
Control Delay (s/veh)										15.8						
Level of Service (LOS)										C						
Approach Delay (s/veh)									15.8							
Approach LOS									C							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	L. Hagen	Intersection	Bascom Norris & Marvin Burnett
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County
Date Performed	10/2/2023	East/West Street	Bascom Norris Drive
Analysis Year	2024	North/South Street	Marvin Burnett Road
Time Analyzed	AM Peak	Peak Hour Factor	0.84
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Build scenario		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration			T				T				LR					
Volume (veh/h)			246				262			113		0				
Percent Heavy Vehicles (%)										3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.23				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.33				

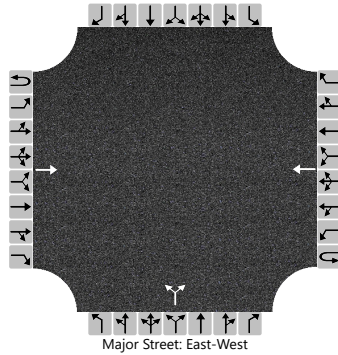
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										135						
Capacity, c (veh/h)										459						
v/c Ratio										0.29						
95% Queue Length, Q ₉₅ (veh)										1.2						
Control Delay (s/veh)										16.1						
Level of Service (LOS)										C						
Approach Delay (s/veh)										16.1						
Approach LOS										C						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	L. Hagen	Intersection	Bascom Norris & Marvin Burnett				
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County				
Date Performed	10/2/2023	East/West Street	Bascom Norris Drive				
Analysis Year	2024	North/South Street	Marvin Burnett Road				
Time Analyzed	PM Peak	Peak Hour Factor	0.84				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	No-build scenario						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration			T				T				LR					
Volume (veh/h)			215				443			152		0				
Percent Heavy Vehicles (%)										3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.23				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.33				

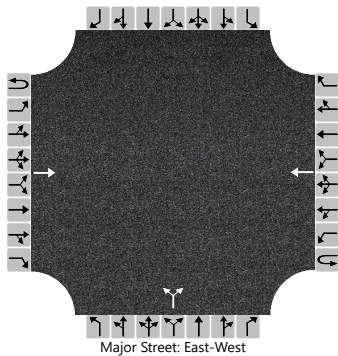
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										181						
Capacity, c (veh/h)										361						
v/c Ratio										0.50						
95% Queue Length, Q ₉₅ (veh)										2.7						
Control Delay (s/veh)										24.6						
Level of Service (LOS)										C						
Approach Delay (s/veh)									24.6							
Approach LOS									C							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	L. Hagen	Intersection	Bascom Norris & Marvin Burnett
Agency/Co.	Hagen Consulting Services	Jurisdiction	Columbia County
Date Performed	10/2/2023	East/West Street	Bascom Norris Drive
Analysis Year	2024	North/South Street	Marvin Burnett Road
Time Analyzed	PM Peak	Peak Hour Factor	0.84
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Build scenario		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration			T				T			LR						
Volume (veh/h)			215				443			163		0				
Percent Heavy Vehicles (%)										3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.23				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										194						
Capacity, c (veh/h)										361						
v/c Ratio										0.54						
95% Queue Length, Q ₉₅ (veh)										3.0						
Control Delay (s/veh)										26.0						
Level of Service (LOS)										D						
Approach Delay (s/veh)									26.0							
Approach LOS									D							