Roads and Bridges Planning Study for

Jumpers Hole Road

Contract # H539621

Date: August 2022

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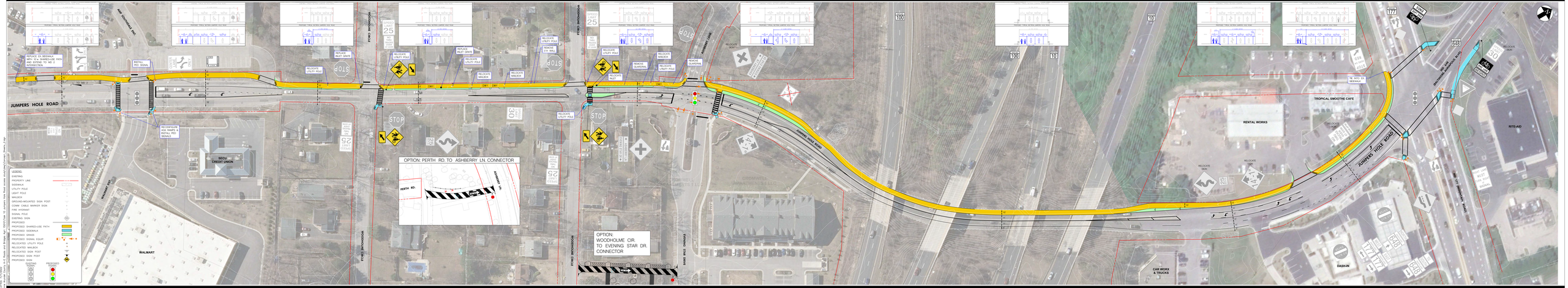


Mead & Hunt

Jumpers Hole Road Option 1: At-grade Side Path Along the West Side

SCALE: 1" = 50'

APPENDICES

Appendix A: Project kick-off presentation
Appendix B: Crash reports
Appendix C: Traffic counts
Appendix D: Warrant analysis
Appendix E: Matrix of pros/cons for initial recommendations
Appendix F: Traffic capacity table, travel time comparison, and HCM reports
Appendix G: Interim options presentation to the community
Appendix H: Final recommendation presentation to the community
Appendix I: Online public comment summary
Appendix J: Full plan sets option 1 and 2 and typical sections

APPENDIX A: PROJECT KICK-OFF PRESENTATION

Anne Arundel County

DPW & YOU

Making a difference, together

Contract #H539621
September 28, 2021

Jumpers Hole Road
Planning Study

Discussion Topics

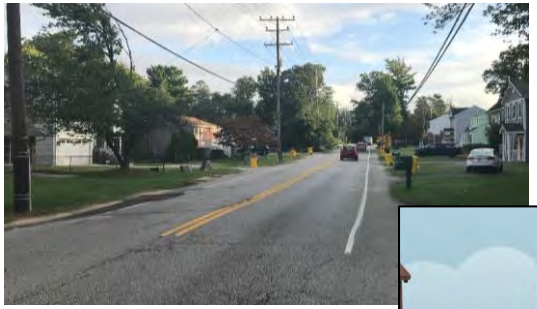
1. Purpose & Need – study origin
    1. Where we left off
2. Existing conditions and issues
3. Summary of community comments received
    1. Recent Survey
4. Interim improvement options
5. Long-term improvements options
6. Next steps
7. Questions

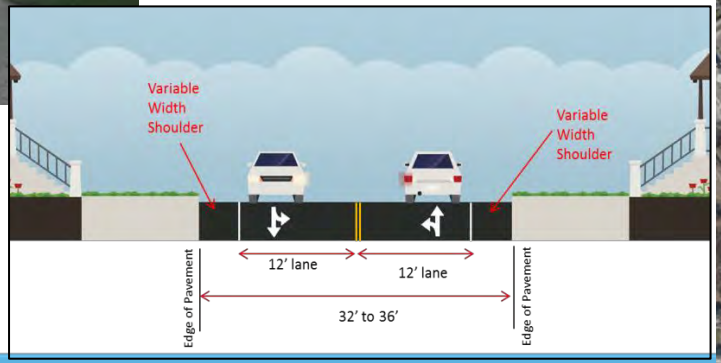
1. Purpose & Need

- Study origin:
  - Neighborhood egress issues
  - Traffic signal desired at Evening Star
  - Pedestrian/bike infrastructure is lacking
  - Speeding
  - Large trucks
- Current evaluation is a *planning* study
  - Subsequent effort to develop future Improvements with detailed designs

2. Existing Conditions – Study Area

- Study area
- Typical roadway cross-section





2. Existing Conditions – Traffic

Updating Traffic Counts & Speeds

- Queueing along Jumpers Hole Road and delays exiting side streets
- Prevailing speed is ~35 mph

2. Existing Conditions – Bike, Pedestrian, Transit, Crash Data

- 200 daily bus riders
- Limited sidewalks and no separated bike facilities
  - Close proximity to B & A Trail.
- New crash data to be collected for prior 5 years

3. Summary of Prior Comments (in order of prevalence)

- Lack of pedestrian facilities & connectivity
- Difficulty exiting from side streets
  - Woodholme, Evening Star
- Desire for Signal at Evening Star / Ashberry
- Lack of bike facilities along corridor
- Speeding
- Need left-turn lane onto Evening Star from southbound Jumpers Hole

3. New Survey Results

- Biggest Concern (in order)
  1. Can't get out of neighborhood
  2. Unsafe to walk or bike to shopping
  3. Speeding
  4. Too many cars
  5. Too many Trucks
  6. Cars running off road onto my property
- When is difficult to leave neighborhood?
  - Morning (27%)
  - Mid-day (15%)
  - Evening (36%)
  - All-day (75%)

3. New Survey Results

- Desired Improvements (in order)
  1. Traffic signal at Evening Star Drive
  2. Traffic calming (e.g., roundabout)
  3. New roadway connections from Woodholme Circle (e.g. to Ashberry Lane or to Evening Star Drive or to Patriots Plaza
  4. No through trucks allowed
  5. Speed limit reduction
  6. No Left Turns allowed from Woodholme Circle
- Desired Pedestrian/bike improvements (in order)
  - Sidewalk on both sides
  - Shared use path
  - Sidewalk on one side
  - On-road bike lanes

3. Ideas under Consideration

- Speed management
- Prohibiting left turns
- New signal
- New roundabout(s)
- New road connections
- 4-way stops
- Through-truck prohibition

4. Interim Recommendations

- JHR sidewalk and bike lanes
- Intersection modifications to provide gaps for turning traffic

5. Ultimate Roadway Improvements

- No additional through travel lanes on JHR
- Build on lower-cost interim recommendations
- Goals:
  - Manage traffic volumes and speeds
  - Pedestrian and bike facilities on both sides
  - Improve egress to Jumpers Hole Road from local neighborhood side streets
  - Minimize right-of-way takes

6. Next Steps

- New traffic counts, crash data, & updated findings
- Additional public input on final recommendations
  - Consensus!
- Complete interim and ultimate recommendations in planning study
- Develop opportunities to implement recommendations from planning study

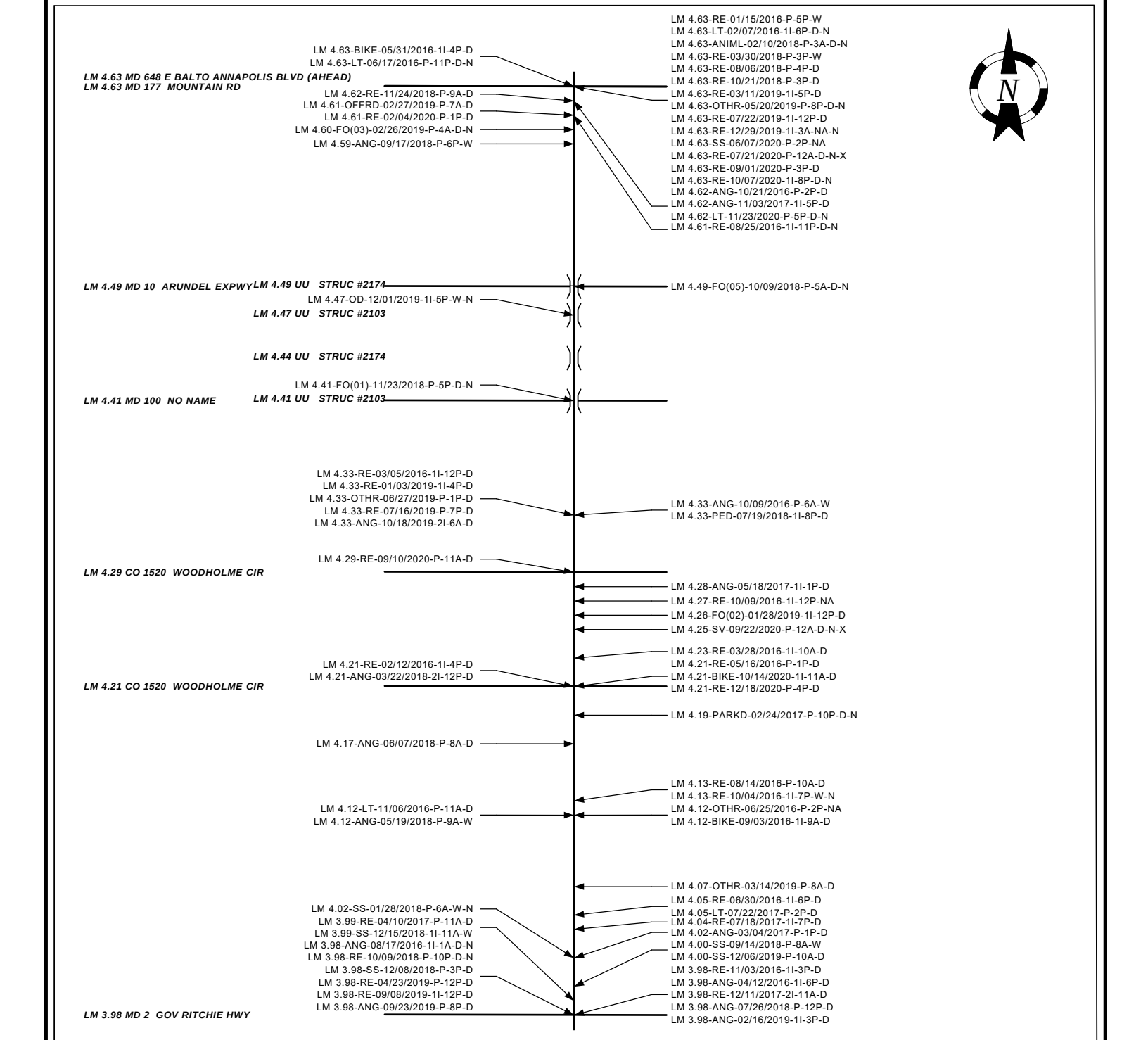
7. Questions?

- Thank you!
- Project contact information
  - **Project Manager:** Adam Greenstein, PE, PTOE,
    - 443-569-9587
    - adam.greenstein@aacounty.org

APPENDIX B: Crash Summary 2017-2021 CRASH LINE DIAGRAM

Office of Traffic & Safety
Traffic Development & Support Division
Crash Analysis Safety Team

Location: Jumpers Hole Rd ~ MD 2 to MD 177
County: ANNE ARUNDEL
Study Period: 02/01/2016 to 12/31/2020
Analyst: Robert L. Booker, Jr. Date: 10/06/2021



KEY:LogMile-CollisionType (FixedObjectStruck) -Date-Severity-Time-Surface-Illumination-Alcohol

template 06-27-06

F - Fatalities	SS - Sideswipe	FO - Fixed Object	OFFRD - Off Road	00 - Not Applicable	08 - Light Support Pole	N - Night
I - Injury	PARKD - Parked Vehicle	OOBJ - Other Object	RUNWY - Downhill Runaway	01 - Bridge or Overpass	09 - Sign Support Pole	X - Alcohol
P - Property Damage	PED - Pedestrian	OT - Overturn	FIRE - Explosion Fire	02 - Building	10 - Other Pole	D - Dry Surface
OD - Opposite Direction	BIKE - Bicycle	SPILL - Spilled Cargo	BCKNG - Backing	03 - Culvert or Ditch	11 - Tree Shrubbery	W - Wet Surface
LT - Left Turn	PEDAL - Other Pedalcycle	JCKKNF - Jackknife	UTURN - U-Turn	04 - Curb	12 - Construction Barrier	I - Icy Surface
RE - Rear End	CONVY - Other Conveyance	SPRTD - Units Separated	OTHR - Other	05 - Guardrail or Barrier	13 - Crash Attenuater	S - Snowy Surface
ANG - Angle	ANIML - Animal	NCOLL - Other Non Collision	UNK - Unknown	06 - Embankment	88 - Other	
				07 - Fence	99 - Unknown	

APPENDIX C: TRAFFIC COUNTS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	V	W	X
1				MEAD & HUNT, INC										Page 1					
2				7055 Samuel Morse Dr Ste. 100															
3				Columbia, M															
4	ANNE ARUNDEL													Site Code: 000000000000					
5	PASADENA													Station ID: 000000000000					
6														JUMPERS HOLE RD BTW. WOODHOLME CIRCLES					
7																			
8														Latitude: 39' 7.7879 North					
9	NB																		
10		1	16	21	26	31	36	41	46	51	56	61	66	71	76				
11		15	20	25	30	35	40	45	50	55	60	65	70	75	999	Time			
12	11/02/21	0	1	1	13	17	13	2	0	0	0	0	0	0	0	12:00 AM			
13	01:00	1	0	0	6	15	5	1	1	0	0	0	0	0	0	1:00 AM			
14	02:00	0	0	1	6	8	7	1	1	1	0	0	0	0	0	2:00 AM			
15	03:00	1	0	3	2	7	4	2	0	0	0	0	0	0	0	3:00 AM			
16	04:00	1	0	2	6	13	8	1	1	0	0	0	0	0	0	4:00 AM			
17	05:00	1	2	5	7	23	18	5	2	0	0	0	0	0	0	5:00 AM			
18	06:00	4	2	4	22	66	44	12	1	0	0	0	0	0	0	6:00 AM			
19	07:00	6	9	26	82	133	50	10	0	0	0	0	0	0	0	7:00 AM			
20	08:00	6	4	27	115	150	75	10	1	0	0	0	0	0	0	8:00 AM			
21	09:00	1	8	50	164	200	62	5	1	0	0	0	0	0	0	9:00 AM			
22	10:00	2	7	41	167	206	55	5	1	0	0	0	0	0	0	10:00 AM			
23	11:00	14	16	42	211	207	46	3	0	0	0	0	0	0	0	11:00 AM			
24	12 PM	10	15	69	216	230	57	4	1	0	0	0	0	0	0	12:00 PM			
25	13:00	6	11	38	245	249	55	6	1	0	0	0	0	0	0	1:00 PM			
26	14:00	15	17	95	292	244	46	4	0	0	0	0	0	0	0	2:00 PM			
27	15:00	15	26	83	348	226	50	2	0	0	0	0	0	0	0	3:00 PM			
28	16:00	18	36	92	401	243	32	1	0	0	0	0	0	0	0	4:00 PM			
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31	19:00	5	11	68	248	240	39	2	0	0	0	0	0	0	0	7:00 PM			
32	20:00	3	4	21	157	185	46	10	0	0	0	0	0	0	0	8:00 PM			
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8														Latitude: 39' 7.7879 N				
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22	10:00	3	2	27	123	312	149	11	0	0	0	0	0	0	0			
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2				7055 Samuel Morse Dr Ste. 100														
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4	ANNE ARUNDEL													Site Code: 000000000000				
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6														JUMPERS HOLE RD BTW. WOODHOLME CIRCLES				
7																		
8														Latitude: 39' 7.7879 North				
9	NB																	
10			Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axle	5 Axle	>6 Axle	<6 Axle	6 Axle	>6 Axle	>7			
11		Motorcycle	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Axle	Total		
12	11/02/21	1	40	5	0	1	0	0	0	0	0	0	0	0	0	47		
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20	08:00	0	305	57	3	18	0	0	3	2	0	0	0	0	0	388		
21	09:00	0	375	81	9	20	2	1	3	0	0	0	0	0	0	491		
22	10:00	0	393	72	0	13	3	0	3	0	0	0	0	0	0	484		
23	11:00	2	433	89	0	11	3	0	1	0	0	0	0	0	0	539		
24	12 PM	1	500	78	0	14	3	0	6	0	0	0	0	0	0	602		
25	13:00	0	508	88	2	10	1	0	2	0	0	0	0	0	0	611		
26	14:00	0	606	85	3	18	0	0	1	0	0	0	0	0	0	713		
27	15:00	0	600	125	5	18	1	0	1	0	0	0	0	0	0	750		
28	16:00	1	703	102	2	13	1	0	1	0	0	0	0	0	0	823		
29	17:00	2	778	112	0	13	1	0	4	0	0	0	0	0	0	910		
30	18:00	0	713	83	0	4	0	0	0	0	0	0	0	0	0	800		
31	19:00	1	542	67	0	2	0	0	1	0	0	0	0	0	0	613		
32	20:00	0	383	42	0	0	0	0	1	0	0	0	0	0	0	426		
33	21:00	1	294	27	0	3	0	0	0	0	0	0	0	0	0	325		
34	22:00	0	172	15	0	0	0	0	0	0	0	0	0	0	0	187		
35	23:00	0	82	6	0	3	0	0	0	0	0	0	0	0	0	91		
36	Total	10	7907	1248	30	180	20	1	34	9	0	0	0	0	0	9439		
37	Percent	0.1%	83.8%	13.2%	0.3%	1.9%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
38																		
39																		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1				MEAD & HUNT, INC										Page 2				
2				7055 Samuel Morse Dr Ste. 100														
3				Columbia, MD 21046														
4	ANNE ARUNDEL													Site Code: 000000000000				
5	PASADENA													Station ID: 000000000000				
6														JUMPERS HOLE RD BTW. WOODHOLME CIRCLES				
7																		
8														Latitude: 39' 7.7879 North				
9	NB																	
10			Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axle	5 Axle	>6 Axle	<6 Axle	6 Axle	>6 Axle	>7			
11		Motorcycle	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Axle	Total		
12	11/03/21	1	40	0	0	1	0	0	0	0	0	0	0	0	0	42		
13	01:00	0	22	3	0	1	1	0	0	0	0	0	0	0	0	27		
14	02:00	0	21	3	1	0	0	0	0	0	0	0	0	0	0	25		
15	03:00	0	9	1	0	0	0	0	0	1	0	0	0	0	0	11		
16	04:00	1	24	5	0	1	0	0	0	1	0	0	0	0	0	32		
17	05:00	0	34	15	1	4	0	0	1	0	0	0	0	0	0	55		
18	06:00	0	120	37	2	4	1	0	0	1	0	0	0	0	0	165		
19	07:00	0	227	52	2	8	3	0	3	1	0	0	0	0	0	296		
20	08:00	0	308	70	1	20	2	0	3	0	0	0	0	0	0	404		
21	09:00	0	418	70	10	23	0	0	3	0	0	0	0	0	0	524		
22	10:00	0	436	84	0	8	1	0	4	0	0	0	0	0	0	533		
23	11:00	4	480	75	1	15	2	0	3	1	0	0	0	0	0	581		
24	12 PM	0	556	87	0	19	0	0	0	0	0	0	0	0	0	662		
25	13:00	1	615	102	4	16	1	0	4	0	0	0	0	0	0	743		
26	14:00	1	604	107	1	13	1	0	4	0	0	0	0	0	0	731		
27	15:00	1	663	122	3	13	5	0	4	1	1	0	0	0	0	813		
28	16:00	1	745	115	2	21	0	0	5	0	0	0	0	0	0	889		
29	17:00	1	786	109	0	8	0	0	3	0	0	0	0	0	0	907		
30	18:00	4	743	100	0	12	0	0	4	1	0	0	0	0	0	864		
31	19:00	0	613	83	0	4	0	0	0	0	0	0	0	0	0	700		
32	20:00	0	504	47	0	5	0	0	2	0	0	0	0	0	0	558		
33	21:00	1	332	37	0	5	0	0	0	0	0	0	0	0	0	375		
34	22:00	0	212	22	0	3	0	0	0	1	0	0	0	0	0	238		
35	23:00	0	81	2	0	0	0	0	0	0	0	0	0	0	0	83		
36	Total	16	8593	1348	28	204	17	0	43	8	1	0	0	0	0	10258		
37	Percent	0.2%	83.8%	13.1%	0.3%	2.0%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1				MEAD & HUNT, INC										Page 3				
2				7055 Samuel Morse Dr Ste. 100														
3				Columbia, MD 21046														
4	ANNE ARUNDEL													Site Code: 000000000000				
5	PASADENA													Station ID: 000000000000				
6														JUMPERS HOLE RD BTW. WOODHOLME CIRCLES				
7																		
8														Latitude: 39' 7.7879 North				
9	SB																	
10			Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axle	5 Axle	>6 Axle	<6 Axle	6 Axle	>6 Axle	>7			
11		Motorcycle	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Axle	Total		
12	11/02/21	0	22	3	1	0	0	0	0	0	0	0	0	0	0	26		
13	01:00	0	9	0	0	1	0	0	0	0	0	0	0	0	0	10		
14	02:00	0	15	0	1	1	1	0	0	0	0	0	0	0	0	18		
15	03:00	0	12	5	0	2	0	0	0	0	0	0	0	0	0	19		
16	04:00	0	59	18	1	9	0	0	1	0	0	0	0	0	0	88		
17	05:00	0	138	23	1	3	1	0	1	2	0	0	0	0	0	169		
18	06:00	1	309	51	4	8	1	0	2	0	1	0	0	0	0	377		
19	07:00	0	576	83	6	14	1	0	4	1	0	0	0	0	0	685		
20	08:00	0	501	86	3	18	1	0	4	0	1	0	0	0	0	614		
21	09:00	0	476	83	2	20	0	0	3	1	0	0	0	0	0	585		
22	10:00	2	447	74	1	17	4	0	4	1	0	0	0	0	0	550		
23	11:00	1	459	67	1	13	4	0	2	0	0	0	0	0	0	547		
24	12 PM	0	511	84	1	14	2	0	1	0	0	0	0	0	0	613		
25	13:00	0	470	71	0	23	1	0	0	0	0	0	0	0	0	565		
26	14:00	1	462	81	2	14	0	0	0	0	0	0	0	0	0	560		
27	15:00	2	482	85	5	19	0	0	1	0	0	0	0	0	0	594		
28	16:00	0	532	75	1	15	0	0	2	0	0	0	0	0	0	625		
29	17:00	1	524	73	1	4	0	0	1	0	0	0	0	0	0	604		
30	18:00	0	484	62	2	6	0	0	1	0	0	0	0	0	0	555		
31	19:00	0	348	43	1	5	0	0	0	0	0	0	0	0	0	397		
32	20:00	0	220	23	2	1	1	0	0	0	0	0	0	0	0	247		
33	21:00	0	164	11	2	2	0	0	0	0	0	0	0	0	0	179		
34	22:00	0	96	8	1	0	0	0	0	0	0	0	0	0	0	105		
35	23:00	0	34	1	1	0	0	0	0	1	0	0	0	0	0	37		
36	Total	8	7350	1110	40	209	17	0	27	6	2	0	0	0	0	8769		
37	Percent	0.1%	83.8%	12.7%	0.5%	2.4%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1				MEAD & HUNT, INC										Page 4				
2				7055 Samuel Morse Dr Ste. 100														
3				Columbia, MD 21046														
4	ANNE ARUNDEL													Site Code: 000000000000				
5	PASADENA													Station ID: 000000000000				
6														JUMPERS HOLE RD BTW. WOODHOLME CIRCLES				
7																		
8														Latitude: 39' 7.7879 North				
9	SB																	
10			Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axle	5 Axle	>6 Axle	<6 Axle	6 Axle	>6 Axle	>7			
11		Motorcycle	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Axle	Total		
12	11/03/21	0	20	2	1	0	0	0	0	0	0	0	0	0	0	23		
13	01:00	1	15	0	1	0	0	0	0	0	0	0	0	0	0	17		
14	02:00	0	19	0	0	1	0	0	0	0	0	0	0	0	0	20		
15	03:00	0	20	3	1	2	0	0	0	0	0	0	0	0	0	26		
16	04:00	0	50	11	2	4	0	0	0	1	0	0	0	0	0	68		
17	05:00	1	118	30	1	4	1	0	2	0	0	0	0	0	0	157		
18	06:00	0	301	51	3	15	0	0	2	3	0	0	0	0	0	375		
19	07:00	1	552	86	4	15	2	0	6	1	0	0	0	0	0	667		
20	08:00	0	521	78	3	12	0	0	4	1	0	0	0	0	0	619		
21	09:00	0	539	94	4	12	0	0	3	0	0	0	0	0	0	652		
22	10:00	0	514	87	4	14	1	0	6	0	1	0	0	0	0	627		
23	11:00	0	515	80	3	16	0	0	1	0	0	0	0	0	0	615		
24	12 PM	1	570	79	2	16	1	0	4	0	0	0	0	0	0	673		
25	13:00	2	497	87	3	16	1	0	2	0	0	0	0	0	0	608		
26	14:00	0	525	90	5	17	0	0	4	0	0	0	0	0	0	641		
27	15:00	6	552	80	3	12	0	0	1	0	0	0	0	0	0	654		
28	16:00	0	592	85	1	13	2	0	2	0	0	0	0	0	0	695		
29	17:00	1	614	73	1	10	1	0	3	0	0	0	0	0	0	703		
30	18:00	0	531	77	2	6	0	0	1	0	0	0	0	0	0	617		
31	19:00	0	359	63	1	10	0	0	0	0	0	0	0	0	0	433		
32	20:00	0	283	28	2	9	0	0	0	1	0	0	0	0	0	323		
33	21:00	0	177	22	2	4	0	0	0	0	0	0	0	0	0	205		
34	22:00	0	102	9	1	0	0	0	1	0	0	0	0	0	0	113		
35	23:00	0	47	4	1	0	0	0	0	0	0	0	0	0	0	52		
36	Total	13	8033	1219	51	208	9	0	42	7	1	0	0	0	0	9583		
37	Percent	0.1%	83.8%	12.7%	0.5%	2.2%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173
County: Anne Arundel
Comments:

Date: 3/12/2019 12:00:00 AM
Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd
Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E					Jumpers Hole Rd					MD 177					MD 177					
	From North					From South					From East					From West					
Begin Hour	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**GrandTotal**
00:00:00	0	5	10	13	28	0	2	8	8	18	0	6	7	4	17	0	8	9	7	24	87
00:15:00	0	3	4	12	19	0	2	9	6	17	0	4	3	1	8	0	10	11	2	23	67
00:30:00	0	5	3	5	13	0	2	4	10	16	1	4	3	2	10	0	7	9	4	20	59
00:45:00	0	2	2	5	9	0	2	3	8	13	1	2	4	1	8	0	7	13	1	21	51
01:00:00	0	0	1	2	3	0	0	7	7	14	0	3	4	2	9	0	3	10	6	19	45
01:15:00	0	1	4	7	12	0	3	9	3	15	2	2	2	2	8	0	2	9	1	12	47
01:30:00	0	5	1	9	15	0	1	4	8	13	0	1	2	1	4	0	3	5	1	9	41
01:45:00	0	1	2	6	9	0	0	2	2	4	0	2	4	4	10	0	2	4	2	8	31
02:00:00	0	4	3	3	10	0	1	6	2	9	0	4	5	3	12	0	2	3	3	8	39
02:15:00	0	1	2	5	8	0	1	3	4	8	1	2	7	3	13	0	2	3	0	5	34
02:30:00	0	0	3	1	4	0	0	3	2	5	0	2	6	3	11	0	4	3	1	8	28
02:45:00	0	2	1	1	4	0	2	2	4	8	0	2	4	1	7	0	3	0	2	5	24
03:00:00	0	3	0	6	9	0	0	1	5	6	0	0	10	1	11	0	1	5	2	8	34
03:15:00	0	1	2	0	3	0	0	2	1	3	0	1	7	1	9	0	2	4	2	8	23
03:30:00	0	2	3	7	12	0	1	0	3	4	0	3	12	0	15	0	0	3	4	7	38
03:45:00	0	2	2	7	11	0	2	3	4	9	0	5	14	1	20	0	4	3	2	9	49
04:00:00	0	6	6	7	19	0	0	3	4	7	1	5	22	0	28	0	1	1	2	4	58
04:15:00	0	0	4	9	13	0	3	3	3	9	0	7	25	1	33	0	2	8	2	12	67
04:30:00	0	3	1	14	18	0	6	4	1	11	0	6	38	1	45	0	4	5	3	12	86
04:45:00	0	7	13	19	39	0	4	0	7	11	0	15	56	2	73	0	5	14	8	27	150
05:00:00	0	5	8	19	32	0	12	8	1	21	1	17	64	9	91	0	3	18	12	33	177
05:15:00	0	11	24	33	68	0	17	9	9	35	0	15	92	7	114	0	6	21	8	35	252
05:30:00	0	16	16	40	72	0	20	10	6	36	0	21	118	10	149	0	2	25	7	34	291
05:45:00	0	8	16	39	63	0	11	9	8	28	0	18	112	18	148	0	5	32	11	48	287
06:00:00	0	9	23	50	82	0	22	10	14	46	0	17	150	16	183	0	4	26	8	38	349
06:15:00	0	11	42	48	101	0	19	16	20	55	0	25	145	21	191	0	7	28	15	50	397
06:30:00	0	13	41	53	107	0	21	11	19	51	1	35	183	18	237	0	12	36	15	63	458
06:45:00	0	9	49	44	102	0	40	17	18	75	2	67	180	17	266	0	15	48	33	96	539
07:00:00	0	12	71	55	138	0	49	28	26	103	0	50	216	22	288	0	17	57	26	100	629
07:15:00	0	31	77	53	161	0	43	25	14	82	0	57	245	29	331	0	23	55	40	118	692
07:30:00	0	16	86	57	159	0	45	30	21	96	0	54	221	38	313	0	17	51	51	119	687
07:45:00	0	26	68	61	155	0	44	41	31	116	0	63	198	52	313	0	23	68	40	131	715
08:00:00	0	25	57	35	117	0	39	35	33	107	1	56	168	33	258	1	25	60	34	120	602
08:15:00	0	22	49	41	112	0	50	40	37	127	1	34	180	41	256	1	33	70	24	128	623
08:30:00	0	21	51	53	125	0	29	45	39	113	4	48	146	39	237	0	29	71	27	127	602
08:45:00	0	24	61	62	147	0	24	43	44	111	1	62	150	54	267	1	25	71	42	139	664
09:00:00	0	28	54	49	131	0	29	52	47	128	1	71	149	54	275	1	24	67	34	126	660
09:15:00	0	24	45	65	134	0	19	48	42	109	0	46	135	31	212	0	20	64	33	117	572

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 | County: Anne Arundel | Comments:

Date: 3/12/2019 12:00:00 AM | Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd | Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E						Jumpers Hole Rd						MD 177						MD 177					
	From North						From South						From East						From West					
09:30:00	0	30	36	49	115	0	26	45	43	114	0	53	126	32	211	0	32	51	52	135	575
09:45:00	0	30	54	41	125	0	25	33	45	103	0	54	139	18	211	1	29	83	41	154	593
10:00:00	0	25	58	40	123	0	29	35	46	110	0	47	99	36	182	0	31	58	41	130	545
10:15:00	0	29	52	41	122	0	35	50	35	120	1	46	107	20	174	1	31	54	35	121	537
10:30:00	0	18	38	47	103	0	32	29	49	110	0	57	96	32	185	0	28	69	41	138	536
10:45:00	0	19	42	53	114	0	28	42	48	118	1	55	102	29	187	1	23	77	52	153	572
11:00:00	0	33	37	48	118	0	27	46	64	137	1	36	81	26	144	0	30	84	47	161	560
11:15:00	0	36	32	43	111	0	25	50	51	126	3	50	111	36	200	1	34	83	38	156	593
11:30:00	0	27	51	45	123	0	35	43	55	133	0	51	86	38	175	0	25	63	42	130	561
11:45:00	0	33	40	46	119	0	32	44	54	130	0	42	104	47	193	1	31	80	50	162	604
12:00:00	0	40	25	41	106	0	31	63	65	159	1	60	89	48	198	0	40	85	43	168	631
12:15:00	0	33	46	41	120	0	39	44	60	143	0	45	110	30	185	0	27	89	49	165	613
12:30:00	0	24	40	44	108	0	41	66	66	173	1	56	108	39	204	0	49	92	55	196	681
12:45:00	0	35	38	53	126	0	46	57	66	169	0	48	110	42	200	0	30	88	52	170	665
13:00:00	0	29	34	51	114	0	34	53	79	166	0	46	109	25	180	0	49	100	70	219	679
13:15:00	0	44	50	44	138	0	36	55	63	154	0	50	84	39	173	0	38	102	59	199	664
13:30:00	0	42	49	45	136	0	37	63	79	179	1	64	99	42	206	0	45	97	65	207	728
13:45:00	0	33	43	45	121	0	33	57	82	172	2	59	139	41	241	0	33	118	56	207	741
14:00:00	0	39	45	57	141	0	39	58	82	179	1	46	112	34	193	0	53	95	63	211	724
14:15:00	0	28	46	32	106	0	35	54	76	165	0	43	111	33	187	0	36	146	50	232	690
14:30:00	0	33	56	45	134	0	36	59	75	170	0	44	108	34	186	1	35	145	49	230	720
14:45:00	0	32	44	53	129	0	28	62	80	170	1	44	111	45	201	1	40	135	59	235	735
15:00:00	0	55	53	51	159	0	31	65	76	172	3	33	86	47	169	1	34	117	46	198	698
15:15:00	0	43	48	47	138	0	35	78	85	198	1	38	117	37	193	1	60	165	57	283	812
15:30:00	0	44	65	64	173	0	28	78	88	194	0	51	104	61	216	0	32	138	53	223	806
15:45:00	0	43	46	54	143	0	37	55	95	187	2	55	129	65	251	0	74	165	85	324	905
16:00:00	0	50	48	52	150	0	41	78	110	229	0	53	124	50	227	2	56	136	42	236	842
16:15:00	0	52	65	61	178	0	30	81	100	211	0	58	128	34	220	0	65	158	63	286	895
16:30:00	0	42	39	41	122	0	42	79	108	229	1	68	100	44	213	1	53	162	80	296	860
16:45:00	0	37	61	48	146	0	32	77	89	198	1	58	108	47	214	0	48	151	69	268	826
17:00:00	0	49	42	55	146	0	40	85	87	212	0	49	109	33	191	0	49	147	52	248	797
17:15:00	0	47	56	42	145	0	35	85	100	220	0	56	127	39	222	0	51	177	74	302	889
17:30:00	0	42	51	37	130	0	37	111	111	259	0	51	118	36	205	0	50	179	60	289	883
17:45:00	0	43	42	58	143	0	22	86	106	214	1	58	104	44	207	0	64	176	55	295	859
18:00:00	0	40	49	49	138	0	37	92	112	241	0	49	104	31	184	0	45	144	82	271	834
18:15:00	0	39	49	29	117	0	32	95	122	249	2	55	78	41	176	1	51	171	50	273	815
18:30:00	0	38	47	49	134	0	27	95	104	226	2	43	101	46	192	0	58	189	46	293	845
18:45:00	0	32	53	51	136	0	35	120	87	242	0	54	95	36	185	1	65	110	58	234	797
19:00:00	0	33	42	40	115	0	31	67	73	171	2	52	90	32	176	0	61	128	40	229	691
19:15:00	0	28	49	28	105	0	36	81	81	198	1	33	80	39	153	1	44	104	42	191	647

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E					Jumpers Hole Rd					MD 177					MD 177					
	From North					From South					From East					From West					
19:30:00	0	23	29	35	87	0	29	67	55	151	0	43	72	35	150	0	36	117	50	203	591
19:45:00	0	28	31	33	92	0	24	53	65	142	1	49	68	25	143	0	39	101	35	175	552
20:00:00	0	29	23	31	83	0	29	82	64	175	0	22	61	20	103	0	29	93	38	160	521
20:15:00	0	15	32	19	66	0	16	49	63	128	0	36	53	14	103	0	29	98	28	155	452
20:30:00	0	20	23	34	77	0	25	62	56	143	1	23	50	24	98	0	44	84	33	161	479
20:45:00	0	29	30	30	89	0	18	64	46	128	0	20	37	26	83	0	34	71	21	126	426
21:00:00	0	20	34	32	86	0	16	55	60	131	3	23	44	22	92	0	20	79	34	133	442
21:15:00	0	15	15	25	55	0	17	43	51	111	1	21	26	22	70	0	24	63	20	107	343
21:30:00	0	14	10	29	53	0	14	49	41	104	0	22	30	14	66	0	32	52	14	98	321
21:45:00	0	12	32	22	66	0	13	39	39	91	0	9	38	8	55	0	18	43	18	79	291
22:00:00	0	18	12	24	54	0	13	18	31	62	0	14	27	18	59	0	16	55	15	86	261
22:15:00	0	10	12	17	39	0	4	34	28	66	1	11	23	13	48	0	13	46	10	69	222
22:30:00	0	12	24	34	70	0	7	16	18	41	1	19	26	13	59	0	14	29	12	55	225
22:45:00	0	8	15	21	44	0	8	10	17	35	0	9	23	9	41	0	18	36	9	63	183
23:00:00	0	6	6	20	32	0	4	32	34	70	1	8	15	6	30	0	13	28	3	44	176
23:15:00	0	5	5	15	25	0	5	14	21	40	1	7	13	10	31	0	14	14	7	35	131
23:30:00	0	8	5	8	21	0	2	7	15	24	0	4	10	6	20	0	11	13	7	31	96
23:45:00	0	8	8	7	23	0	2	14	14	30	0	4	14	4	22	1	6	16	3	26	101
TOTAL	**0**	**2093**	**3112**	**3291**	**8496**	**0**	**2148**	**3877**	**4336**	**10361**	**57**	**3186**	**7960**	**2360**	**13563**	**20**	**2501**	**6739**	**3035**	**12295**	**44715**
AMPEAK	**0**	**85**	**302**	**226**	**613**	**0**	**181**	**124**	**92**	**397**	**0**	**224**	**880**	**141**	**1245**	**0**	**80**	**231**	**157**	**468**	**2723**
PMPEAK	**0**	**187**	**198**	**208**	**593**	**0**	**150**	**293**	**413**	**856**	**3**	**234**	**481**	**193**	**911**	**3**	**248**	**621**	**270**	**1142**	**3502**
DAYPEAK	**0**	**187**	**198**	**208**	**593**	**0**	**150**	**293**	**413**	**856**	**3**	**234**	**481**	**193**	**911**	**3**	**248**	**621**	**270**	**1142**	**3502**

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E			Jumpers Hole Rd			MD 177			MD 177		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
00:00:00	0	0	0	0	0	0	0	0	0	0	0	0
00:15:00	0	0	0	0	0	0	0	0	0	0	0	0
00:30:00	0	0	0	0	0	0	0	0	0	0	0	0
00:45:00	0	0	0	0	0	0	0	0	0	0	0	0
01:00:00	0	0	0	0	0	0	0	0	0	0	0	0
01:15:00	0	0	0	0	0	0	0	0	0	0	0	0
01:30:00	0	0	0	0	0	0	0	0	0	0	0	0
01:45:00	0	0	0	0	0	0	0	0	0	0	0	0
02:00:00	0	0	0	0	0	0	0	0	0	0	0	0
02:15:00	0	0	0	0	0	0	0	0	0	0	0	0
02:30:00	0	0	0	0	0	0	0	0	0	0	0	0
02:45:00	0	0	0	0	0	0	0	0	0	0	0	0
03:00:00	0	0	0	0	0	0	0	0	0	0	0	0
03:15:00	0	0	0	0	0	0	0	0	0	0	0	0
03:30:00	0	0	0	0	0	0	0	0	0	0	0	0
03:45:00	0	0	0	0	0	0	0	0	0	0	0	0
04:00:00	0	0	0	0	0	0	0	0	0	0	0	0
04:15:00	0	0	0	0	0	0	0	0	0	0	0	0
04:30:00	0	0	0	0	0	0	0	0	0	0	0	0
04:45:00	0	0	0	0	0	0	0	0	0	0	0	0
05:00:00	0	0	0	0	0	0	0	0	0	0	0	0
05:15:00	0	0	0	0	0	0	0	0	0	0	0	0
05:30:00	0	0	0	0	0	0	0	0	0	0	0	0
05:45:00	0	0	0	0	0	0	0	0	0	0	0	0
06:00:00	0	0	0	0	0	0	0	0	0	0	0	0
06:15:00	0	0	0	0	0	0	0	0	0	0	0	0
06:30:00	0	0	0	0	0	0	0	0	0	0	0	0
06:45:00	0	0	0	0	0	0	0	0	0	0	1	0
07:00:00	0	0	0	0	0	0	0	1	0	0	0	0
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0
07:30:00	0	0	0	0	0	0	0	0	0	0	0	0
07:45:00	0	0	0	0	0	0	0	0	0	0	0	0
08:00:00	0	0	0	0	0	0	0	0	0	0	0	0
08:15:00	0	0	0	0	0	0	0	0	0	0	0	0
08:30:00	0	0	0	0	0	0	0	0	0	0	0	0
08:45:00	0	0	0	0	0	0	0	0	0	0	0	0
09:00:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15:00	0	0	0	0	0	0	0	1	0	0	0	0

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E			Jumpers Hole Rd			MD 177			MD 177		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
09:30:00	0	0	0	0	0	0	0	1	0	0	0	0
09:45:00	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	1	0	0	0	0
10:15:00	0	0	0	0	0	0	0	1	0	0	0	0
10:30:00	0	0	0	0	0	0	0	1	0	0	0	0
10:45:00	0	0	0	0	0	0	0	2	0	0	0	0
11:00:00	0	0	0	0	0	0	0	2	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	1	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	1	0	0	0	0
13:45:00	0	1	0	0	0	0	0	1	0	0	0	0
14:00:00	0	1	0	0	0	0	0	0	0	0	0	0
14:15:00	0	0	0	0	0	0	0	1	0	0	0	0
14:30:00	0	0	0	0	0	0	0	3	0	0	0	0
14:45:00	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	1	0	0	0	0
15:15:00	0	1	0	0	0	0	0	1	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	1	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	2	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	1	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	1	0
17:30:00	0	0	0	0	0	0	0	2	0	0	0	0
17:45:00	0	0	0	0	0	0	0	2	0	0	0	0
18:00:00	0	0	0	0	0	0	0	1	0	0	0	0
18:15:00	0	0	0	0	0	0	0	1	0	0	0	0
18:30:00	0	0	0	0	1	0	0	0	0	0	0	0
18:45:00	0	0	0	0	1	0	0	0	0	0	0	0

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173
County: Anne Arundel
Comments:

Date: 3/12/2019 12:00:00 AM
Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd
Weather: Sunny

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

	MD 648E			Jumpers Hole Rd			MD 177			MD 177		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	3	0	0	0	0
19:30:00	0	0	0	0	0	0	0	1	0	0	0	0
19:45:00	0	0	0	0	0	0	0	0	0	0	0	0
20:00:00	0	0	0	0	0	0	0	1	0	0	0	0
20:15:00	0	0	0	0	0	0	0	1	0	0	0	0
20:30:00	0	0	0	0	0	0	0	0	0	0	0	0
20:45:00	0	0	0	0	0	0	0	0	0	0	0	0
21:00:00	0	0	0	0	0	0	0	0	0	0	0	0
21:15:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30:00	0	0	0	0	0	0	0	1	0	0	0	0
21:45:00	0	0	0	0	0	0	0	0	0	0	0	0
22:00:00	0	0	0	0	0	0	0	0	0	0	0	0
22:15:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30:00	0	0	0	0	0	0	0	0	0	0	0	0
22:45:00	0	0	0	0	0	0	0	0	0	0	0	0
23:00:00	0	0	0	0	0	0	0	0	0	0	0	0
23:15:00	0	0	0	0	0	0	0	1	0	0	0	0
23:30:00	0	0	0	0	0	0	0	0	0	0	0	0
23:45:00	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**5**	**0**	**0**	**2**	**0**	**0**	**35**	**0**	**0**	**2**	**0**
AMPEAK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
PMPEAK	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
DAYPEAK	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

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Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

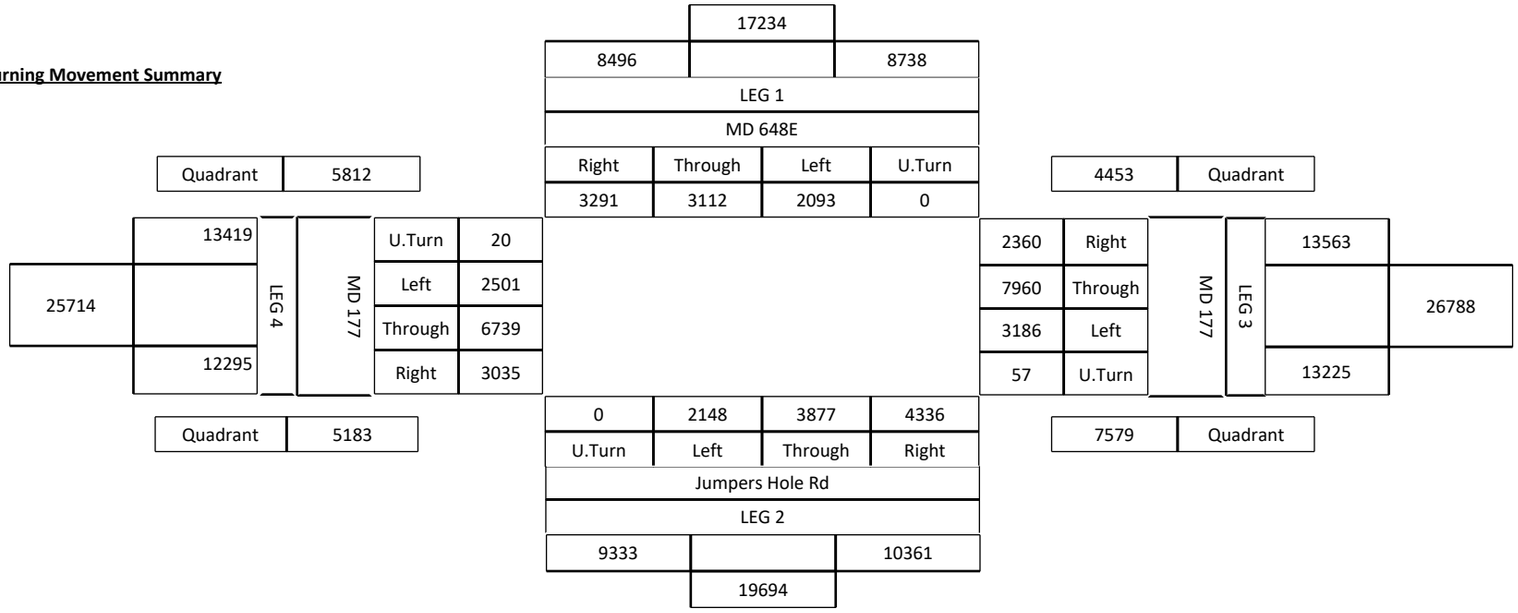
MD 648E — From North

Jumpers Hole Rd — From South

MD 177 — From East

MD 177 — From West

Turning Movement Summary



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

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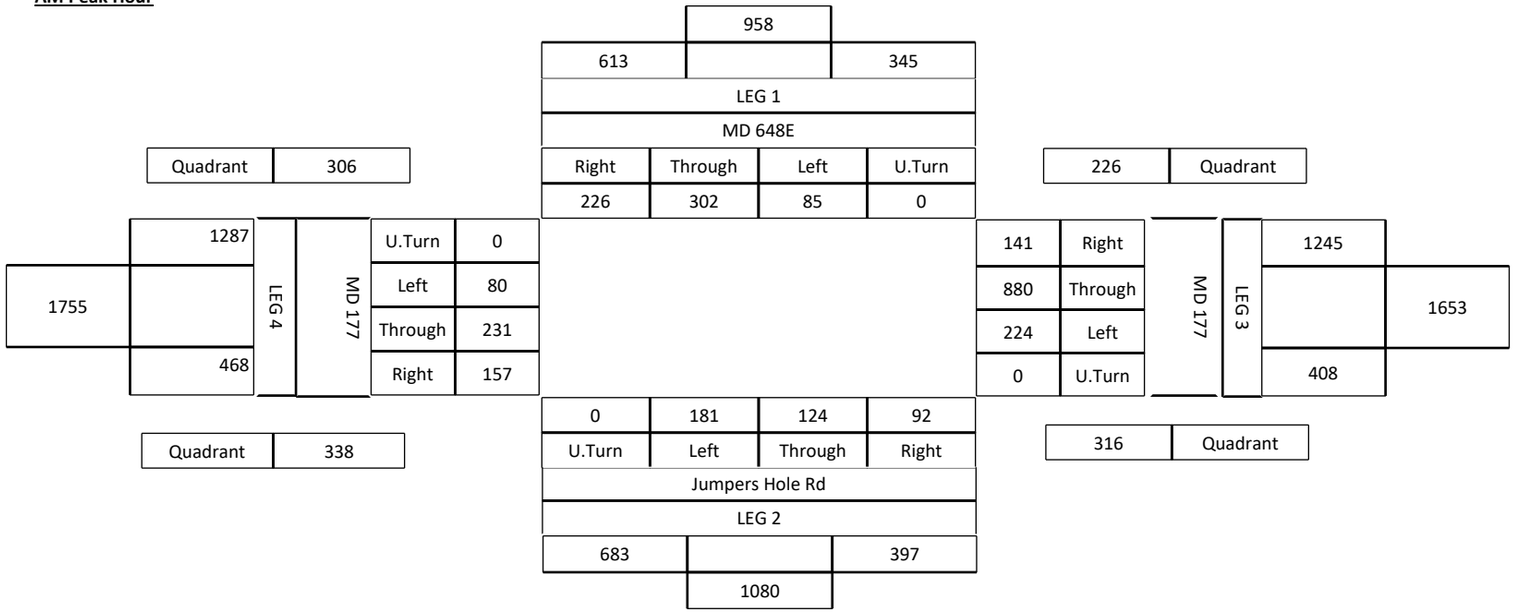
MD 648E — From North

Jumpers Hole Rd — From South

MD 177 — From East

MD 177 — From West

AM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

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Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

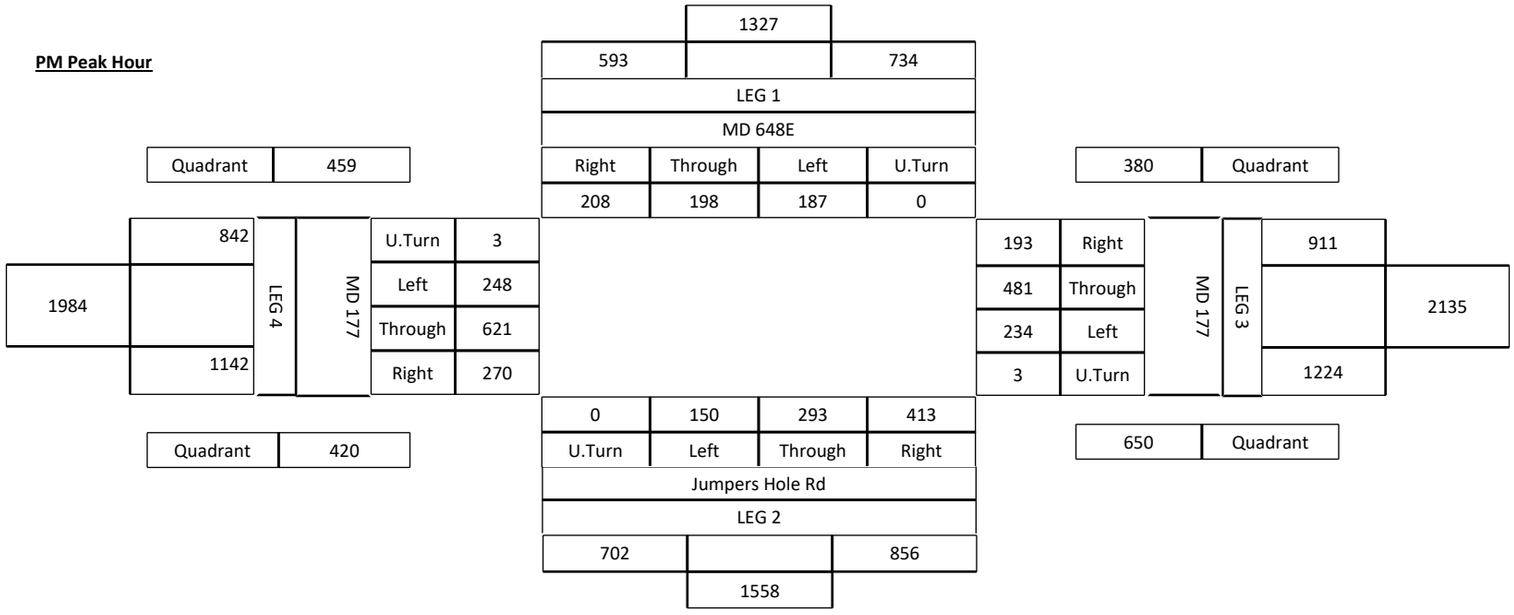
MD 648E — From North

Jumpers Hole Rd — From South

MD 177 — From East

MD 177 — From West

PM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020173 County: Anne Arundel Comments:

Date: 3/12/2019 12:00:00 AM Town: none

Location: MD 177 at MD 648E/Jumpers Hole Rd Weather: Sunny

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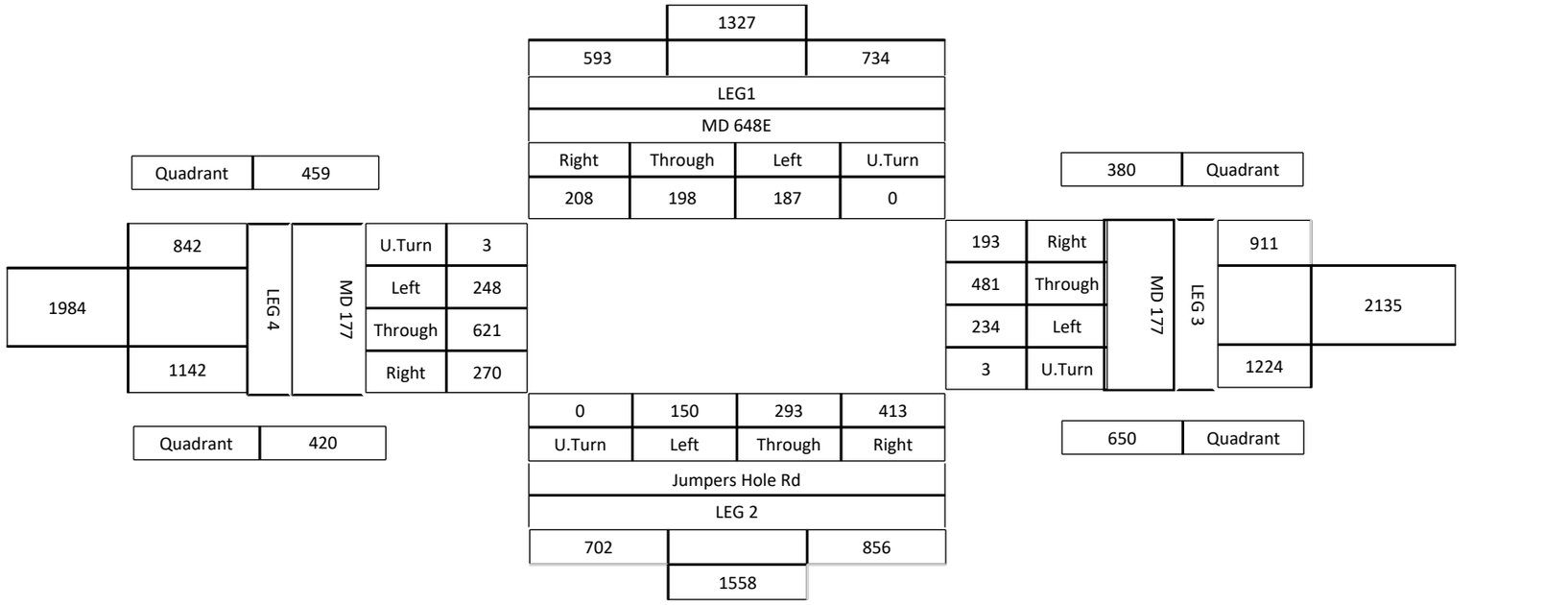
Hours	6:00AM-12:00PM	07:00	07:45	2723	B	0.65	12:00PM-19:00PM	15:45	16:30	3502	B	0.67

Jumpers Hole Rd — From North

MD 177 — From South

MD 177 — From East

MD 177 — From West



Sabra, Wang, & Associates, Inc
7055 Samuel Morse Dr, Suite 100
Columbia, MD 21046
443-741-3500

Weather: Sunny
Counted By: Habib
Town: Pasadena
County: Anne Arundel

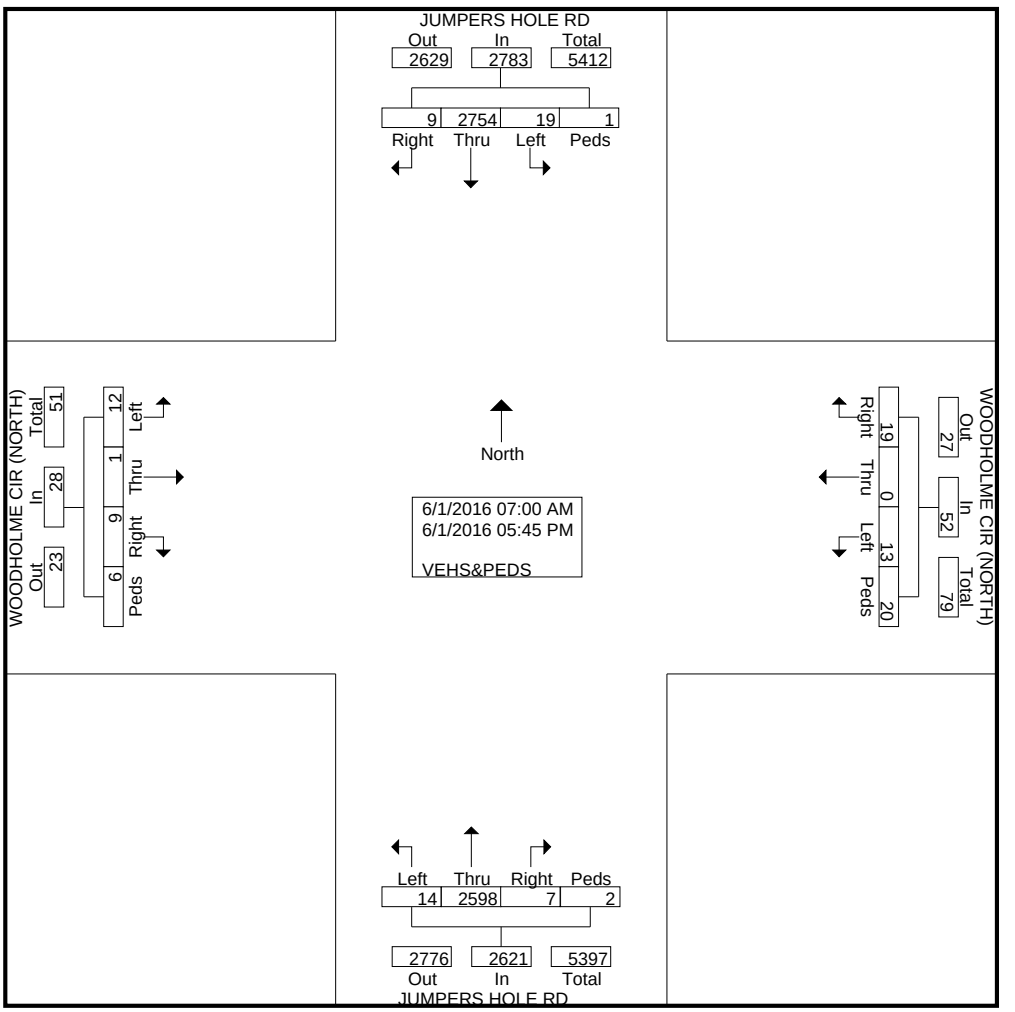
File Name : Jumpers Hole Rd at Woodholme Cir North
Site Code : 00000000
Start Date : 6/1/2016
Page No : 1

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					WOODHOLME CIR (NORTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (NORTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	155	0	0	155	1	0	0	0	1	0	96	0	0	96	0	0	1	1	2	254
07:15 AM	1	183	0	0	184	2	0	2	0	4	1	94	0	0	95	1	1	1	0	3	286
07:30 AM	0	196	0	0	196	0	0	0	1	1	0	98	0	0	98	1	0	1	0	2	297
07:45 AM	0	200	0	0	200	0	0	0	0	0	1	107	0	0	108	1	0	1	0	2	310
Total	1	734	0	0	735	3	0	2	1	6	2	395	0	0	397	3	1	4	1	9	1147
08:00 AM	1	156	0	0	157	1	0	0	1	2	2	111	0	0	113	1	0	1	0	2	274
08:15 AM	3	141	2	0	146	0	0	2	0	2	1	113	0	0	114	2	0	2	0	4	266
08:30 AM	1	155	1	0	157	4	0	3	4	11	0	115	1	0	116	2	0	1	1	4	288
08:45 AM	1	168	0	0	169	0	0	0	0	0	2	102	0	0	104	0	0	0	0	0	273
Total	6	620	3	0	629	5	0	5	5	15	5	441	1	0	447	5	0	4	1	10	1101
BREAK																					
04:00 PM	2	178	1	0	181	1	0	3	2	6	0	216	0	0	216	2	0	1	1	4	407
04:15 PM	2	172	1	0	175	0	0	2	2	4	2	220	2	0	224	0	0	0	1	1	404
04:30 PM	0	158	0	0	158	0	0	0	3	3	1	227	0	0	228	0	0	0	0	0	389
04:45 PM	3	161	1	0	165	0	0	1	3	4	0	229	0	0	229	0	0	0	0	0	398
Total	7	669	3	0	679	1	0	6	10	17	3	892	2	0	897	2	0	1	2	5	1598
05:00 PM	1	175	0	1	177	1	0	2	0	3	1	219	0	0	220	0	0	0	0	0	400
05:15 PM	2	198	1	0	201	1	0	2	1	4	0	216	1	2	219	1	0	0	0	1	425
05:30 PM	0	177	1	0	178	2	0	0	0	2	1	228	2	0	231	0	0	0	2	2	413
05:45 PM	2	181	1	0	184	0	0	2	3	5	2	207	1	0	210	1	0	0	0	1	400
Total	5	731	3	1	740	4	0	6	4	14	4	870	4	2	880	2	0	0	2	4	1638
Grand Total	19	2754	9	1	2783	13	0	19	20	52	14	2598	7	2	2621	12	1	9	6	28	5484
Apprch %	0.7	99	0.3	0		25	0	36.5	38.5		0.5	99.1	0.3	0.1		42.9	3.6	32.1	21.4		
Total %	0.3	50.2	0.2	0	50.7	0.2	0	0.3	0.4	0.9	0.3	47.4	0.1	0	47.8	0.2	0	0.2	0.1	0.5	

Sabra, Wang, & Associates, Inc
7055 Samuel Morse Dr, Suite 100
Columbia, MD 21046
443-741-3500

File Name : Jumpers Hole Rd at Woodholme Cir North
Site Code : 00000000
Start Date : 6/1/2016
Page No : 2



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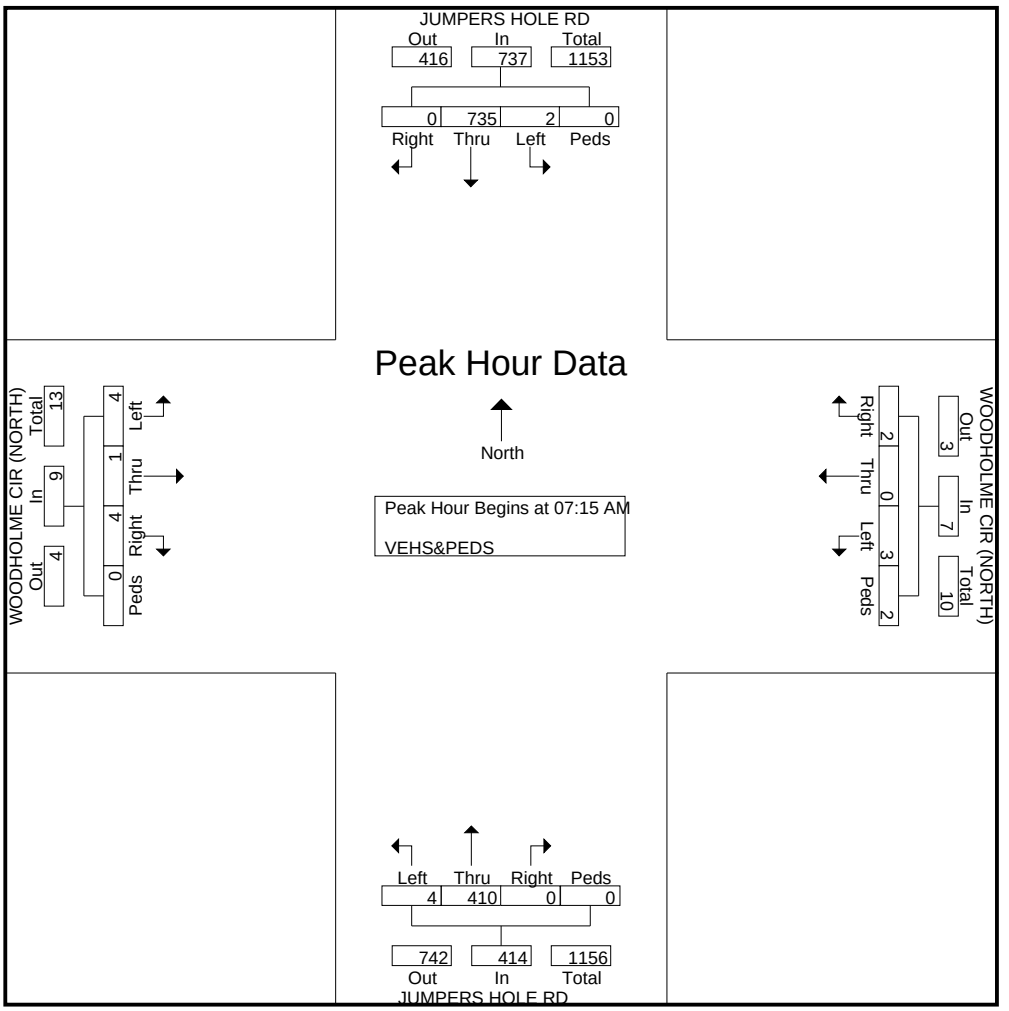
Start Date : 6/1/2016

	JUMPERS HOLE RD From North					WOODHOLME CIR (NORTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (NORTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	**1**	183	0	0	184	**2**	0	**2**	0	**4**	1	94	0	0	95	**1**	**1**	**1**	0	**3**	286
07:30 AM	0	196	0	0	196	0	0	0	**1**	1	0	98	0	0	98	1	0	1	0	2	297
07:45 AM	0	**200**	0	0	**200**	0	0	0	0	0	1	107	0	0	108	1	0	1	0	2	**310**
08:00 AM	1	156	0	0	157	1	0	0	1	2	**2**	**111**	0	0	**113**	1	0	1	0	2	274
Total Volume	2	735	0	0	737	3	0	2	2	7	4	410	0	0	414	4	1	4	0	9	1167
% App. Total	0.3	99.7	0	0		42.9	0	28.6	28.6		1	99	0	0		44.4	11.1	44.4	0		
PHF	.500	.919	.000	.000	.921	.375	.000	.250	.500	.438	.500	.923	.000	.000	.916	1.00	.250	1.00	.000	.750	.941



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File Name : Jumpers Hole Rd at Woodholme Cir North
Site Code : 00000000
Start Date : 6/1/2016
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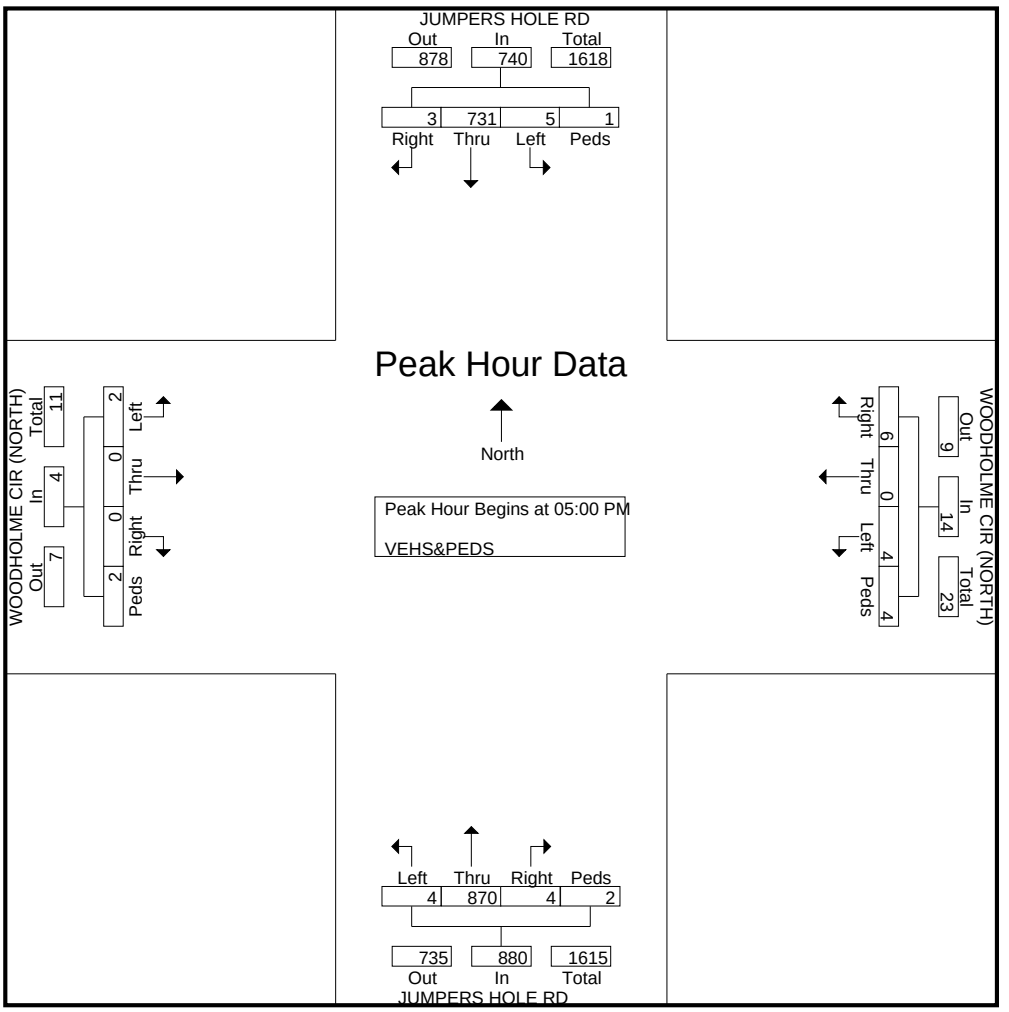
	JUMPERS HOLE RD From North					WOODHOLME CIR (NORTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (NORTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	175	0	**1**	177	1	0	**2**	0	3	1	219	0	0	220	0	0	0	0	0	400
05:15 PM	**2**	**198**	**1**	0	**201**	1	0	2	1	4	0	216	1	**2**	219	**1**	0	0	0	1	**425**
05:30 PM	0	177	1	0	178	**2**	0	0	0	2	1	**228**	**2**	0	**231**	0	0	0	**2**	**2**	413
05:45 PM	2	181	1	0	184	0	0	2	**3**	**5**	**2**	207	1	0	210	1	0	0	0	1	400
Total Volume	5	731	3	1	740	4	0	6	4	14	4	870	4	2	880	2	0	0	2	4	1638
% App. Total	0.7	98.8	0.4	0.1		28.6	0	42.9	28.6		0.5	98.9	0.5	0.2		50	0	0	50		
PHF	.625	.923	.750	.250	.920	.500	.000	.750	.333	.700	.500	.954	.500	.250	.952	.500	.000	.000	.250	.500	.964



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Weather: Sunny
Counted By: Chris
Town: Pasadena
County: Anne Arundel

File Name : Jumpers Hole Rd at Woodholme Cir South
Site Code : 00000000
Start Date : 6/1/2016
Page No : 1

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					WOODHOLME CIR (SOUTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (SOUTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	158	1	1	160	1	0	0	0	1	2	92	0	0	94	0	0	3	0	3	258
07:15 AM	0	187	0	0	187	0	0	1	0	1	1	93	0	0	94	0	0	3	0	3	285
07:30 AM	0	194	0	0	194	1	0	1	0	2	1	96	0	1	98	0	0	4	0	4	298
07:45 AM	1	197	0	0	198	1	0	2	0	3	0	103	0	1	104	0	0	2	0	2	307
Total	1	736	1	1	739	3	0	4	0	7	4	384	0	2	390	0	0	12	0	12	1148
08:00 AM	0	155	0	0	155	1	0	1	0	2	2	114	0	1	117	1	0	0	0	1	275
08:15 AM	1	138	1	0	140	1	0	0	0	1	0	109	2	0	111	3	0	0	0	3	255
08:30 AM	0	157	0	0	157	2	0	2	0	4	2	115	0	4	121	0	1	0	1	2	284
08:45 AM	0	168	0	0	168	1	0	0	0	1	0	101	0	0	101	0	0	2	0	2	272
Total	1	618	1	0	620	5	0	3	0	8	4	439	2	5	450	4	1	2	1	8	1086
BREAK																					
04:00 PM	1	174	2	2	179	0	0	1	1	2	2	213	1	0	216	0	0	0	1	1	398
04:15 PM	0	169	3	1	173	0	0	1	1	2	1	224	0	0	225	1	0	2	1	4	404
04:30 PM	0	158	0	0	158	2	0	0	3	5	1	225	2	0	228	1	0	0	1	2	393
04:45 PM	1	161	1	0	163	0	0	0	0	0	0	232	1	2	235	1	0	3	1	5	403
Total	2	662	6	3	673	2	0	2	5	9	4	894	4	2	904	3	0	5	4	12	1598
05:00 PM	3	172	0	0	175	0	0	0	0	0	2	220	3	0	225	0	0	4	0	4	404
05:15 PM	1	197	0	1	199	2	0	1	0	3	1	213	1	1	216	1	0	2	0	3	421
05:30 PM	2	171	1	1	175	0	0	0	1	1	1	235	1	0	237	0	0	3	0	3	416
05:45 PM	0	184	0	0	184	1	0	1	0	2	2	209	3	2	216	1	0	0	0	1	403
Total	6	724	1	2	733	3	0	2	1	6	6	877	8	3	894	2	0	9	0	11	1644
Grand Total	10	2740	9	6	2765	13	0	11	6	30	18	2594	14	12	2638	9	1	28	5	43	5476
Apprch %	0.4	99.1	0.3	0.2		43.3	0	36.7	20		0.7	98.3	0.5	0.5		20.9	2.3	65.1	11.6		
Total %	0.2	50	0.2	0.1	50.5	0.2	0	0.2	0.1	0.5	0.3	47.4	0.3	0.2	48.2	0.2	0	0.5	0.1	0.8	

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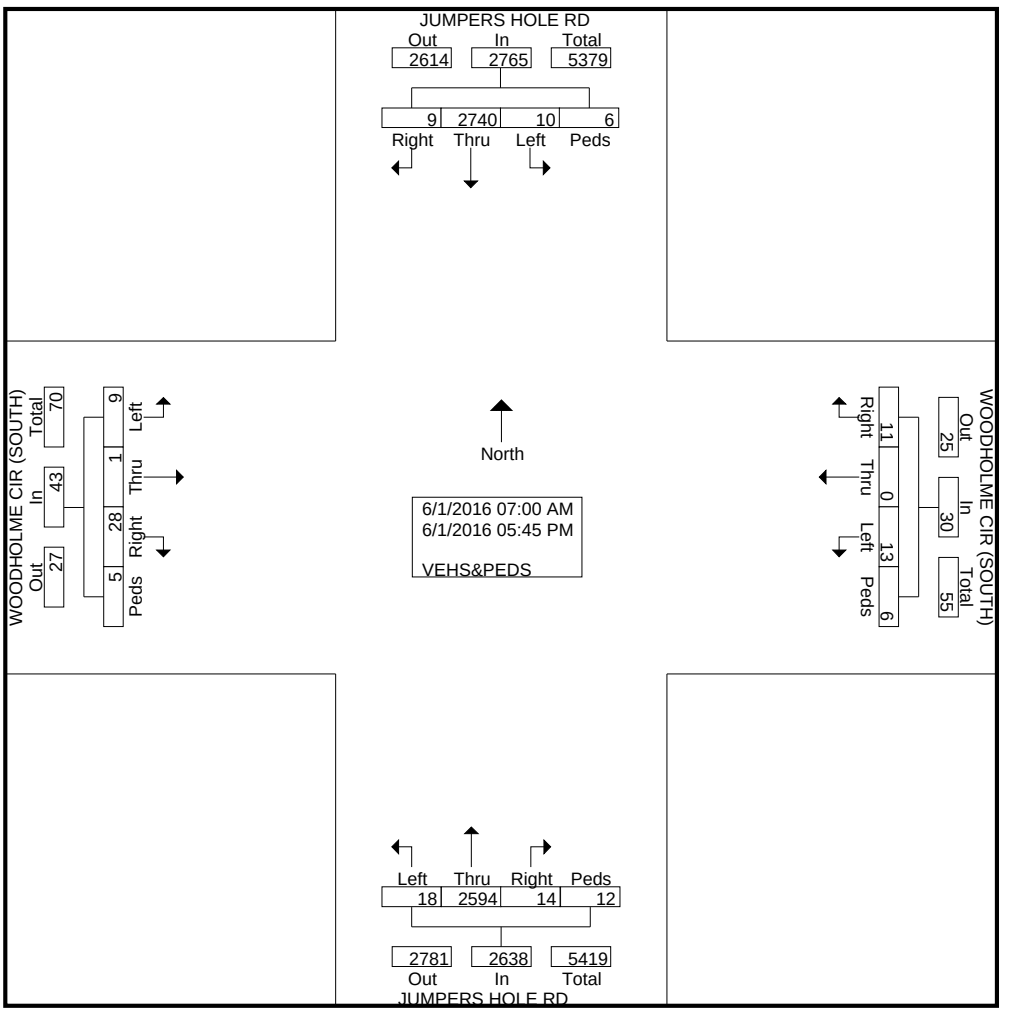

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File Name : Jumpers Hole Rd at Woodholme Cir South
Site Code : 00000000
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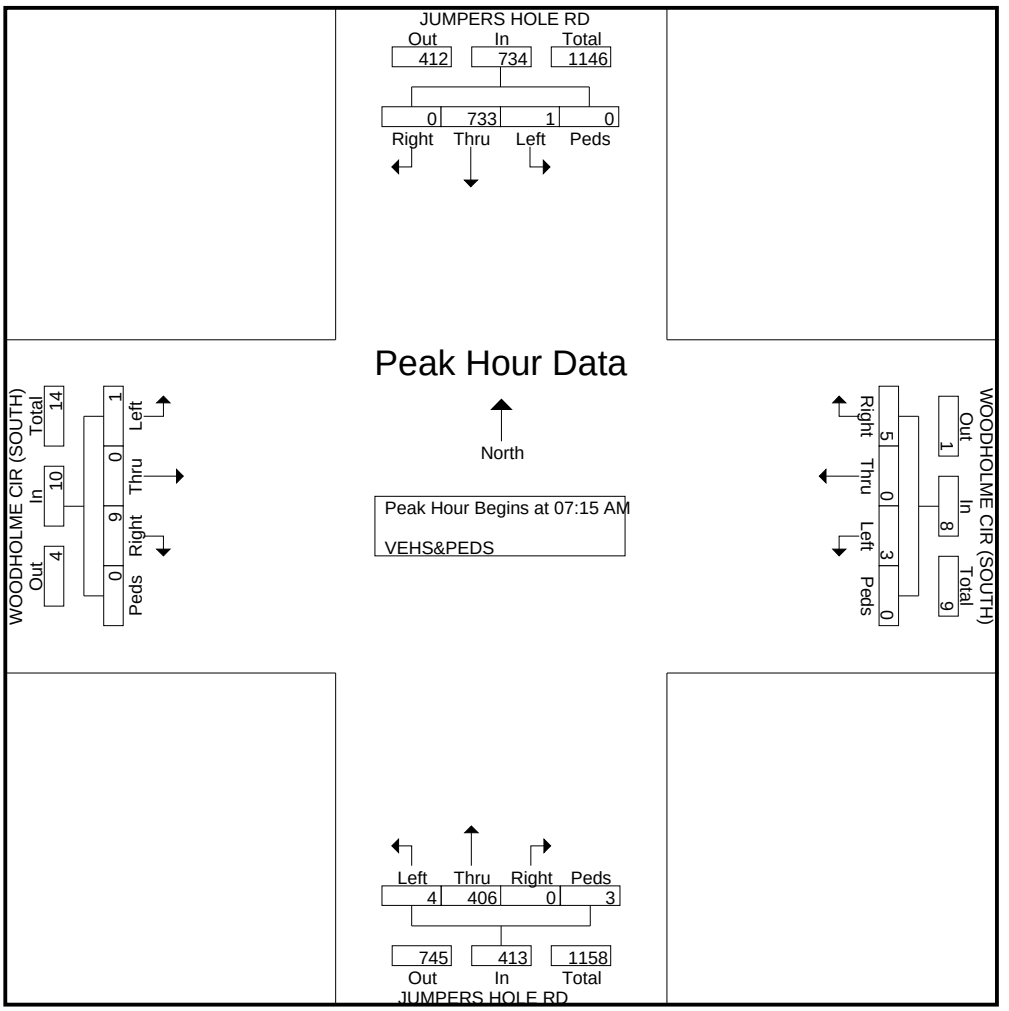
Page No : 3

	JUMPERS HOLE RD From North					WOODHOLME CIR (SOUTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (SOUTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	187	0	0	187	0	0	1	0	1	1	93	0	0	94	0	0	3	0	3	285
07:30 AM	0	194	0	0	194	**1**	0	1	0	2	1	96	0	**1**	98	0	0	**4**	0	**4**	298
07:45 AM	**1**	**197**	0	0	**198**	1	0	**2**	0	**3**	0	103	0	1	104	0	0	2	0	2	**307**
08:00 AM	0	155	0	0	155	1	0	1	0	2	**2**	**114**	0	1	**117**	**1**	0	0	0	1	275
Total Volume	1	733	0	0	734	3	0	5	0	8	4	406	0	3	413	1	0	9	0	10	1165
% App. Total	0.1	99.9	0	0		37.5	0	62.5	0		1	98.3	0	0.7		10	0	90	0		
PHF	.250	.930	.000	.000	.927	.750	.000	.625	.000	.667	.500	.890	.000	.750	.882	.250	.000	.563	.000	.625	.949



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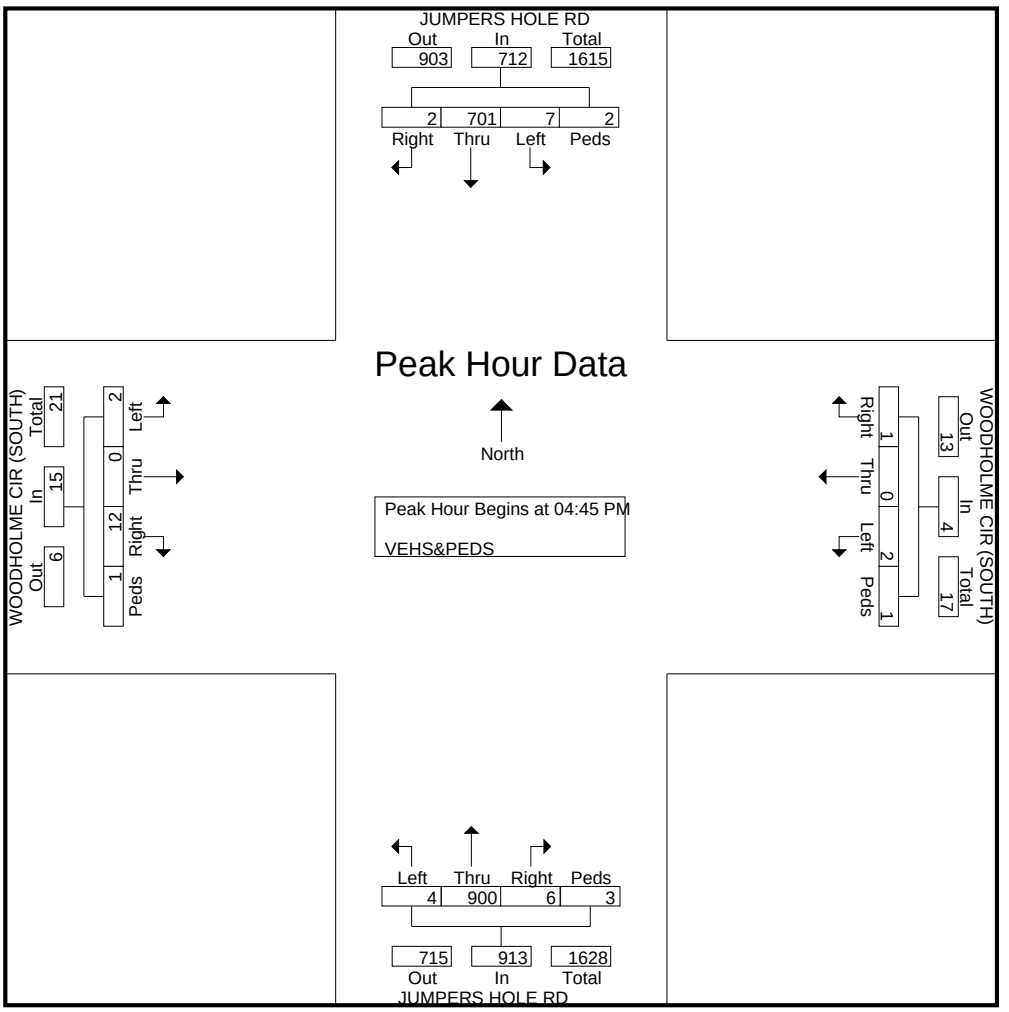
File Name : Jumpers Hole Rd at Woodholme Cir South
Site Code : 00000000
Start Date : 6/1/2016

	JUMPERS HOLE RD From North					WOODHOLME CIR (SOUTH) From East					JUMPERS HOLE RD From South					WOODHOLME CIR (SOUTH) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	161	**1**	0	163	0	0	0	0	0	0	232	1	**2**	235	**1**	0	3	**1**	**5**	403
05:00 PM	**3**	172	0	0	175	0	0	0	0	0	**2**	220	**3**	0	225	0	0	**4**	0	4	404
05:15 PM	1	**197**	0	**1**	**199**	**2**	0	**1**	0	**3**	1	213	1	1	216	1	0	2	0	3	**421**
05:30 PM	2	171	1	1	175	0	0	0	**1**	1	1	**235**	1	0	**237**	0	0	3	0	3	416
Total Volume	7	701	2	2	712	2	0	1	1	4	4	900	6	3	913	2	0	12	1	15	1644
% App. Total	1	98.5	0.3	0.3		50	0	25	25		0.4	98.6	0.7	0.3		13.3	0	80	6.7		
PHF	.583	.890	.500	.500	.894	.250	.000	.250	.250	.333	.500	.957	.500	.375	.963	.500	.000	.750	.250	.750	.976



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174
Date: 3/6/2019 12:00:00 AM
Location: MD 2 at Jumpers Hole Rd
Interval: 60 Min

County: Anne Arundel
Town: none
Weather: Clear

Comments:

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2					MD 2					Jumpers Hole Rd					Jumpers Hole Rd					
	From North					From South					From East					From West					
Begin Hour	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**U.Turn**	**Left**	**Through**	**Right**	**TOTAL**	**GrandTotal**
00:00:00	0	14	8	2	24	0	1	5	3	9	0	3	5	6	14	0	4	7	1	12	59
00:15:00	0	4	12	7	23	0	3	7	2	12	0	1	3	3	7	0	3	8	0	11	53
00:30:00	1	5	9	4	19	0	0	10	0	10	0	2	3	4	9	0	5	4	0	9	47
00:45:00	0	4	4	4	12	0	0	5	1	6	0	2	1	4	7	0	2	2	1	5	30
01:00:00	1	6	6	1	14	0	0	4	0	4	0	1	1	2	4	0	2	3	0	5	27
01:15:00	1	1	1	1	4	0	1	3	1	5	0	3	0	3	6	0	0	4	0	4	19
01:30:00	0	4	4	2	10	0	0	1	0	1	0	1	1	2	4	0	0	2	0	2	17
01:45:00	0	1	6	0	7	0	1	7	2	10	0	0	1	1	2	0	2	3	1	6	25
02:00:00	1	6	11	3	21	0	0	5	0	5	0	1	1	0	2	0	0	0	0	0	28
02:15:00	0	6	3	0	9	0	2	4	1	7	0	0	1	2	3	0	1	2	0	3	22
02:30:00	0	3	3	2	8	0	0	5	0	5	0	3	0	1	4	0	0	1	0	1	18
02:45:00	0	3	6	1	10	0	1	4	0	5	0	1	3	8	12	0	0	0	0	0	27
03:00:00	0	1	4	2	7	0	0	4	0	4	0	2	0	2	4	0	4	0	0	4	19
03:15:00	0	1	3	0	4	0	1	3	0	4	0	1	1	2	4	0	0	2	0	2	14
03:30:00	0	4	5	2	11	0	1	6	0	7	0	0	1	5	6	0	2	0	1	3	27
03:45:00	1	2	7	2	12	0	0	5	0	5	0	0	3	3	6	0	3	1	0	4	27
04:00:00	1	3	9	2	15	0	0	2	3	5	0	2	3	3	8	0	5	3	2	10	38
04:15:00	1	0	11	3	15	0	0	8	3	11	0	4	1	5	10	0	8	2	0	10	46
04:30:00	0	7	11	1	19	0	1	12	5	18	0	1	4	4	9	0	7	4	3	14	60
04:45:00	1	2	21	9	33	0	0	14	2	16	0	6	8	9	23	0	3	5	4	12	84
05:00:00	1	0	20	12	33	0	2	17	2	21	0	4	10	9	23	0	11	2	2	15	92
05:15:00	0	7	25	6	38	1	3	20	4	28	0	10	11	14	35	0	17	5	4	26	127
05:30:00	1	11	30	14	56	0	4	26	1	31	0	10	24	15	49	0	18	10	3	31	167
05:45:00	2	3	34	16	55	0	1	33	5	39	0	13	13	13	39	0	15	19	5	39	172
06:00:00	1	19	42	16	78	0	3	37	2	42	0	16	17	17	50	0	12	18	6	36	206
06:15:00	3	14	37	26	80	1	7	49	10	67	0	20	38	27	85	0	33	22	9	64	296
06:30:00	0	19	47	36	102	0	17	59	2	78	0	24	50	11	85	0	33	17	12	62	327
06:45:00	4	19	82	60	165	1	20	99	11	131	0	24	83	20	127	0	31	35	13	79	502
07:00:00	5	22	64	32	123	0	24	81	13	118	0	37	99	29	165	0	58	96	19	173	579
07:15:00	3	18	75	42	138	1	24	150	15	190	0	31	88	27	146	0	65	112	22	199	673
07:30:00	2	20	63	39	124	1	15	119	10	145	0	34	109	32	175	0	66	109	11	186	630
07:45:00	8	26	77	62	173	3	26	152	14	195	0	33	93	27	153	0	61	86	17	164	685
08:00:00	3	21	77	51	152	3	30	118	20	171	0	38	49	29	116	0	69	35	19	123	562
08:15:00	5	33	78	51	167	4	16	103	18	141	0	23	34	27	84	0	53	42	14	109	501
08:30:00	4	35	81	32	152	4	20	90	18	132	0	23	49	32	104	0	58	38	23	119	507
08:45:00	3	32	69	38	142	7	21	105	23	156	0	37	60	30	127	0	49	59	20	128	553
09:00:00	9	46	84	25	164	9	30	108	16	163	0	37	34	21	92	0	57	54	17	128	547
09:15:00	7	34	85	33	159	9	23	112	20	164	0	24	33	26	83	0	62	34	10	106	512

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 | County: Anne Arundel | Comments:

Date: 3/6/2019 12:00:00 AM | Town: none

Location: MD 2 at Jumpers Hole Rd | Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2 From North						MD 2 From South						Jumpers Hole Rd From East						Jumpers Hole Rd From West					
09:30:00	8	45	99	28	180	6	29	93	19	147	0	34	52	23	109	0	61	50	22	133	569
09:45:00	4	49	104	45	202	14	20	105	28	167	0	25	35	31	91	0	65	36	15	116	576
10:00:00	4	42	105	45	196	9	19	135	11	174	0	24	37	18	79	0	48	54	20	122	571
10:15:00	5	38	104	36	183	10	24	118	14	166	0	36	44	26	106	0	57	57	24	138	593
10:30:00	8	47	118	41	214	14	32	111	26	183	0	36	36	31	103	0	47	27	21	95	595
10:45:00	6	52	124	55	237	12	26	124	28	190	0	32	37	22	91	0	67	44	25	136	654
11:00:00	3	54	105	42	204	9	39	110	25	183	0	24	57	26	107	0	39	43	29	111	605
11:15:00	4	52	140	51	247	13	24	124	21	182	0	22	34	23	79	0	45	46	20	111	619
11:30:00	3	53	131	45	232	10	23	159	24	216	0	30	39	52	121	0	31	52	29	112	681
11:45:00	6	68	123	42	239	15	29	155	33	232	0	41	68	29	138	0	57	57	20	134	743
12:00:00	11	59	124	47	241	17	34	125	14	190	0	43	51	22	116	0	53	53	23	129	676
12:15:00	10	50	150	47	257	14	40	126	24	204	0	33	38	22	93	0	49	58	26	133	687
12:30:00	5	60	119	36	220	7	22	132	27	188	0	39	44	27	110	0	74	49	28	151	669
12:45:00	4	74	120	39	237	17	44	160	25	246	0	42	49	28	119	0	43	48	35	126	728
13:00:00	2	64	134	44	244	9	23	117	30	179	0	43	50	33	126	0	70	52	23	145	694
13:15:00	14	66	136	63	279	17	42	157	32	248	0	43	35	31	109	0	60	52	30	142	778
13:30:00	2	58	118	39	217	11	34	134	24	203	0	22	35	32	89	0	53	54	24	131	640
13:45:00	12	69	130	63	274	17	38	128	26	209	0	40	40	26	106	0	61	57	19	137	726
14:00:00	2	52	153	55	262	14	31	152	43	240	0	44	44	38	126	0	66	118	26	210	838
14:15:00	1	70	141	47	259	16	33	128	28	205	0	42	45	24	111	0	47	103	24	174	749
14:30:00	4	80	174	64	322	13	44	119	17	193	0	31	41	22	94	0	62	65	26	153	762
14:45:00	6	81	161	75	323	15	45	107	33	200	4	44	47	22	117	0	59	74	30	163	803
15:00:00	2	85	171	55	313	10	41	136	47	234	0	30	22	22	74	0	72	63	13	148	769
15:15:00	7	91	140	56	294	8	44	147	25	224	0	31	41	27	99	0	50	65	28	143	760
15:30:00	7	83	172	73	335	13	47	139	23	222	0	32	47	37	116	0	71	63	20	154	827
15:45:00	5	71	148	70	294	14	31	137	18	200	0	30	61	31	122	0	79	77	29	185	801
16:00:00	1	78	127	58	264	13	44	117	31	205	0	46	60	24	130	0	61	89	21	171	770
16:15:00	7	84	133	80	304	9	44	164	43	260	0	43	58	28	129	0	84	89	42	215	908
16:30:00	9	74	148	101	332	15	47	166	34	262	0	33	52	31	116	0	78	87	32	197	907
16:45:00	7	66	164	96	333	13	44	155	38	250	0	27	53	27	107	0	83	113	29	225	915
17:00:00	6	90	172	94	362	8	42	137	45	232	0	33	98	30	161	1	109	68	27	205	960
17:15:00	6	76	160	91	333	6	42	133	43	224	0	42	101	30	173	0	65	80	20	165	895
17:30:00	4	98	180	104	386	10	50	135	31	226	0	34	75	41	150	0	97	85	21	203	965
17:45:00	5	89	183	85	362	2	46	142	49	239	0	38	83	28	149	0	85	83	28	196	946
18:00:00	5	88	120	65	278	9	42	120	35	206	0	27	59	30	116	0	73	82	23	178	778
18:15:00	7	84	133	59	283	9	42	151	38	240	0	30	45	17	92	0	64	67	21	152	767
18:30:00	5	72	102	43	222	7	31	103	24	165	0	36	60	26	122	0	71	53	20	144	653
18:45:00	2	55	94	29	180	12	34	110	31	187	0	22	51	22	95	0	61	56	14	131	593
19:00:00	2	63	114	59	238	5	54	105	13	177	0	42	42	30	114	0	57	81	26	164	693
19:15:00	4	65	84	44	197	7	58	99	29	193	0	32	31	30	93	0	60	67	23	150	633

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Jumpers Hole Rd Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2					MD 2					Jumpers Hole Rd					Jumpers Hole Rd					
	From North					From South					From East					From West					
19:30:00	5	51	94	65	215	3	80	96	31	210	0	20	37	22	79	0	33	82	16	131	635
19:45:00	4	40	89	43	176	11	27	88	26	152	0	24	28	14	66	0	50	88	13	151	545
20:00:00	5	61	58	36	160	2	29	56	15	102	0	19	32	17	68	0	47	55	13	115	445
20:15:00	3	45	58	42	148	2	23	74	14	113	0	14	31	22	67	0	36	28	15	79	407
20:30:00	1	31	53	23	108	3	15	71	29	118	0	13	21	20	54	0	27	45	11	83	363
20:45:00	0	42	44	39	125	2	19	60	13	94	0	20	29	13	62	0	13	33	11	57	338
21:00:00	5	46	36	36	123	0	16	63	21	100	0	8	25	15	48	0	35	36	9	80	351
21:15:00	3	37	38	29	107	0	15	42	26	83	0	10	18	14	42	0	22	27	5	54	286
21:30:00	4	32	30	34	100	0	17	34	12	63	0	10	25	21	56	0	25	23	3	51	270
21:45:00	2	35	25	24	86	2	10	31	12	55	0	11	16	10	37	0	20	25	2	47	225
22:00:00	3	18	16	19	56	2	5	36	13	56	0	8	5	8	21	0	20	26	0	46	179
22:15:00	3	21	32	7	63	1	2	47	10	60	0	10	10	7	27	0	6	13	2	21	171
22:30:00	1	20	28	11	60	1	7	19	5	32	0	5	12	12	29	0	11	8	1	20	141
22:45:00	1	5	13	5	24	1	9	23	12	45	0	5	5	7	17	0	10	16	4	30	116
23:00:00	1	13	17	9	40	1	10	16	4	31	0	5	4	10	19	0	16	22	3	41	131
23:15:00	1	11	18	10	40	0	6	21	6	33	0	6	7	7	20	0	3	12	2	17	110
23:30:00	0	15	15	1	31	0	3	15	3	21	0	4	3	6	13	0	3	4	1	8	73
23:45:00	1	7	12	4	24	0	0	9	4	13	0	1	5	4	10	0	2	3	0	5	52
TOTAL	**327**	**3681**	**7248**	**3387**	**14643**	**524**	**2069**	**7608**	**1632**	**11833**	**4**	**2043**	**3245**	**1823**	**7115**	**1**	**3732**	**4009**	**1326**	**9068**	**42659**
AMPEAK	**24**	**232**	**518**	**185**	**959**	**55**	**110**	**563**	**92**	**820**	**0**	**136**	**192**	**126**	**454**	**0**	**186**	**208**	**92**	**486**	**2719**
PMPEAK	**21**	**353**	**695**	**374**	**1443**	**26**	**180**	**547**	**168**	**921**	**0**	**147**	**357**	**129**	**633**	**1**	**356**	**316**	**96**	**769**	**3766**
DAYPEAK	**21**	**353**	**695**	**374**	**1443**	**26**	**180**	**547**	**168**	**921**	**0**	**147**	**357**	**129**	**633**	**1**	**356**	**316**	**96**	**769**	**3766**

Maryland Department of Transportation
State Highway Administration
Data Services Division
Turning Movement Summary Report

Station ID: S2000020174 | County: Anne Arundel | Comments:

Date: 3/6/2019 12:00:00 AM | Town: none

Location: MD 2 at Jumpers Hole Rd | Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2			MD 2			Jumpers Hole Rd			Jumpers Hole Rd		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
00:00:00	0	0	0	0	0	0	0	1	0	0	0	0
00:15:00	0	0	0	0	0	0	0	0	0	0	0	0
00:30:00	0	0	0	0	0	0	0	0	0	0	0	0
00:45:00	0	0	0	0	0	0	0	0	0	0	0	0
01:00:00	0	0	0	0	0	0	0	0	0	0	0	0
01:15:00	0	0	0	0	0	0	0	0	0	0	0	0
01:30:00	0	0	0	0	0	0	0	0	0	0	0	0
01:45:00	0	0	0	0	0	0	0	0	0	0	0	0
02:00:00	0	0	0	0	0	0	0	0	0	0	0	0
02:15:00	0	0	0	0	0	0	0	0	0	0	0	0
02:30:00	0	0	0	0	0	0	0	0	0	0	0	0
02:45:00	0	0	0	0	0	0	0	2	0	0	0	0
03:00:00	0	0	0	0	0	0	0	0	0	0	0	0
03:15:00	0	0	0	0	0	0	0	0	0	0	0	0
03:30:00	0	0	0	0	0	0	0	0	0	0	0	0
03:45:00	0	0	0	0	0	0	0	0	0	0	0	0
04:00:00	0	1	0	0	0	0	0	0	0	0	0	0
04:15:00	0	0	0	0	0	0	0	0	0	0	0	0
04:30:00	0	0	0	0	0	0	0	0	0	0	0	0
04:45:00	0	0	0	0	0	0	0	0	0	0	0	0
05:00:00	0	0	0	0	0	0	0	1	0	0	0	0
05:15:00	0	0	0	0	0	0	0	0	0	0	0	0
05:30:00	0	0	0	0	0	0	0	0	0	0	0	0
05:45:00	0	0	0	0	0	0	0	0	0	0	0	0
06:00:00	0	1	0	0	0	0	0	0	0	0	0	0
06:15:00	0	0	0	0	0	0	0	0	0	0	0	0
06:30:00	0	0	0	0	0	0	0	1	0	0	0	0
06:45:00	0	0	0	0	0	0	0	0	0	0	0	0
07:00:00	0	0	0	0	0	0	0	0	0	0	0	0
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0
07:30:00	0	0	0	0	0	0	0	0	0	0	0	0
07:45:00	0	1	0	0	0	0	0	1	0	0	0	0
08:00:00	0	0	0	0	0	0	0	1	0	0	0	0
08:15:00	0	0	0	0	0	0	0	0	0	0	0	0
08:30:00	0	1	0	0	0	0	0	1	0	0	0	0
08:45:00	0	2	0	0	0	0	0	3	0	0	0	0
09:00:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15:00	0	0	0	0	0	0	0	0	0	0	0	0

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

Maryland Department of Transportation
State Highway Administration
Data Services Division
Turning Movement Summary Report

Station ID: S2000020174
Date: 3/6/2019 12:00:00 AM
Location: MD 2 at Jumpers Hole Rd
Interval: 60 Min

County: Anne Arundel
Town: none
Weather: Clear

Comments:

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2			MD 2			Jumpers Hole Rd			Jumpers Hole Rd		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
09:30:00	0	0	0	0	0	0	0	0	0	0	0	0
09:45:00	0	1	0	0	0	0	0	1	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	1	0	0	0	0
10:30:00	0	0	0	0	0	0	0	1	0	0	1	0
10:45:00	0	0	0	0	0	0	0	0	0	0	1	0
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	0	1	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	2	0	0	0	0	0	2	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	1	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	1	0	0	0	0	0	2	0	0	0	0
13:00:00	0	0	0	0	1	0	0	1	0	0	0	0
13:15:00	0	1	0	0	0	0	0	0	0	0	0	0
13:30:00	0	1	0	0	0	0	0	1	0	0	1	0
13:45:00	0	1	0	0	0	0	0	0	0	0	0	0
14:00:00	0	4	0	0	0	0	0	2	0	0	0	0
14:15:00	0	1	0	0	0	0	0	0	0	0	0	0
14:30:00	0	0	0	0	0	0	0	0	0	0	0	0
14:45:00	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	1	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	3	0	0	0	0
16:00:00	0	2	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	1	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	1	0	0	0	0	0	1	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	1	0	0	0	0	0	1	0	0	0	0
17:30:00	0	1	0	0	1	0	0	0	0	0	0	0
17:45:00	0	1	0	0	0	0	0	0	0	0	0	0
18:00:00	0	1	0	0	0	0	0	2	0	0	0	0
18:15:00	0	0	0	0	1	0	0	1	0	0	0	0
18:30:00	0	1	0	0	0	0	0	1	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0

Maryland Department of Transportation
State Highway Administration
Data Services Division
Turning Movement Summary Report

Station ID: S2000020174 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Jumpers Hole Rd Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

	MD 2			MD 2			Jumpers Hole Rd			Jumpers Hole Rd		
	From North			From South			From East			From West		
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	1	0	0	0	0
19:30:00	0	1	0	0	0	0	0	0	0	0	0	0
19:45:00	0	1	0	0	0	0	0	0	0	0	0	0
20:00:00	0	0	0	0	0	0	0	0	0	0	0	0
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30:00	0	3	0	0	0	0	0	3	0	0	0	0
20:45:00	0	0	0	0	0	0	0	0	0	0	0	0
21:00:00	0	0	0	0	0	0	0	0	0	0	0	0
21:15:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30:00	0	0	0	0	0	0	0	1	0	0	0	0
21:45:00	0	0	0	0	0	0	0	2	0	0	0	0
22:00:00	0	2	0	0	0	0	0	1	0	0	0	0
22:15:00	0	0	0	0	0	0	0	1	0	0	0	0
22:30:00	0	2	0	0	0	0	0	2	0	0	0	0
22:45:00	0	1	0	0	0	0	0	0	0	0	1	0
23:00:00	0	0	0	0	0	0	0	0	0	0	0	0
23:15:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30:00	0	0	0	0	0	0	0	0	0	0	0	0
23:45:00	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**37**	**0**	**0**	**3**	**0**	**0**	**45**	**0**	**0**	**4**	**0**
AMPEAK	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
PMPEAK	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
DAYPEAK	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 | County: Anne Arundel | Comments:

Date: 3/6/2019 12:00:00 AM | Town: none

Location: MD 2 at Jumpers Hole Rd | Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

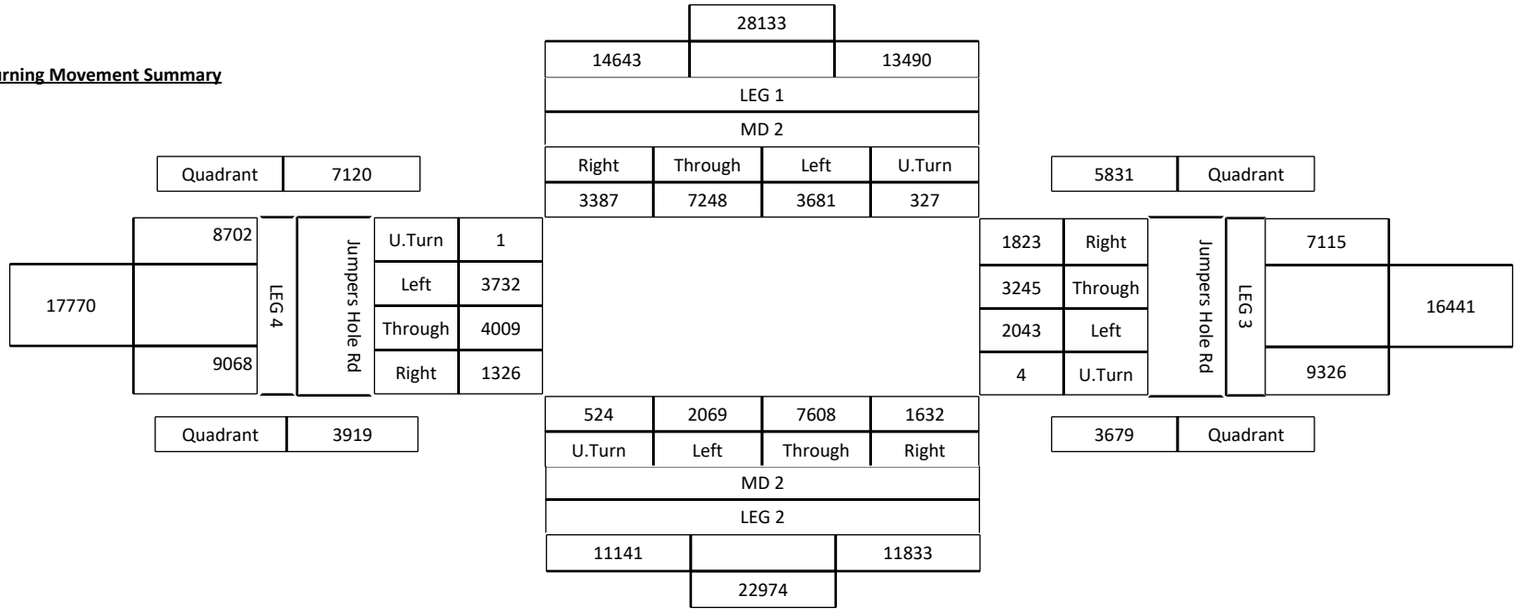
MD 2 — From North

MD 2 — From South

Jumpers Hole Rd — From East

Jumpers Hole Rd — From West

Turning Movement Summary



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 | County: Anne Arundel | Comments:

Date: 3/6/2019 12:00:00 AM | Town: none

Location: MD 2 at Jumpers Hole Rd | Weather: Clear

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PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
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MD 2 — From North

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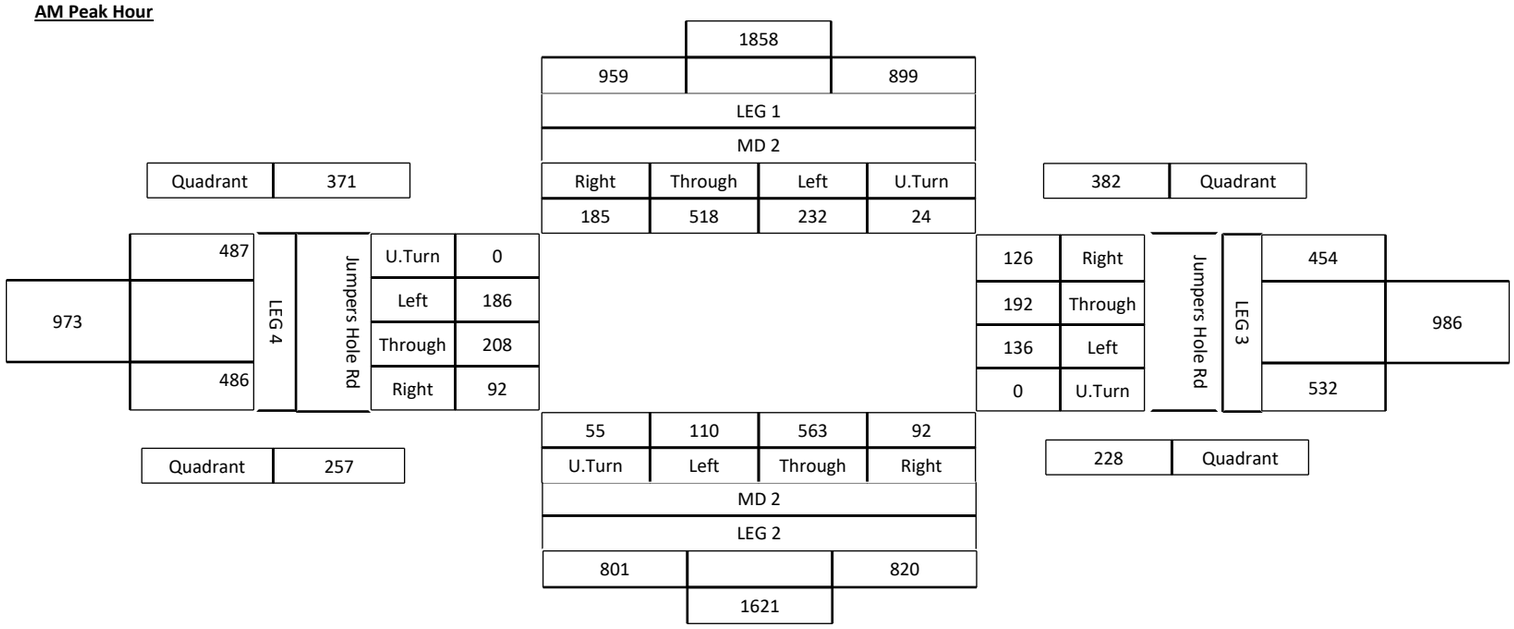
Jumpers Hole Rd — From East

Jumpers Hole Rd — From West

AM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Jumpers Hole Rd Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

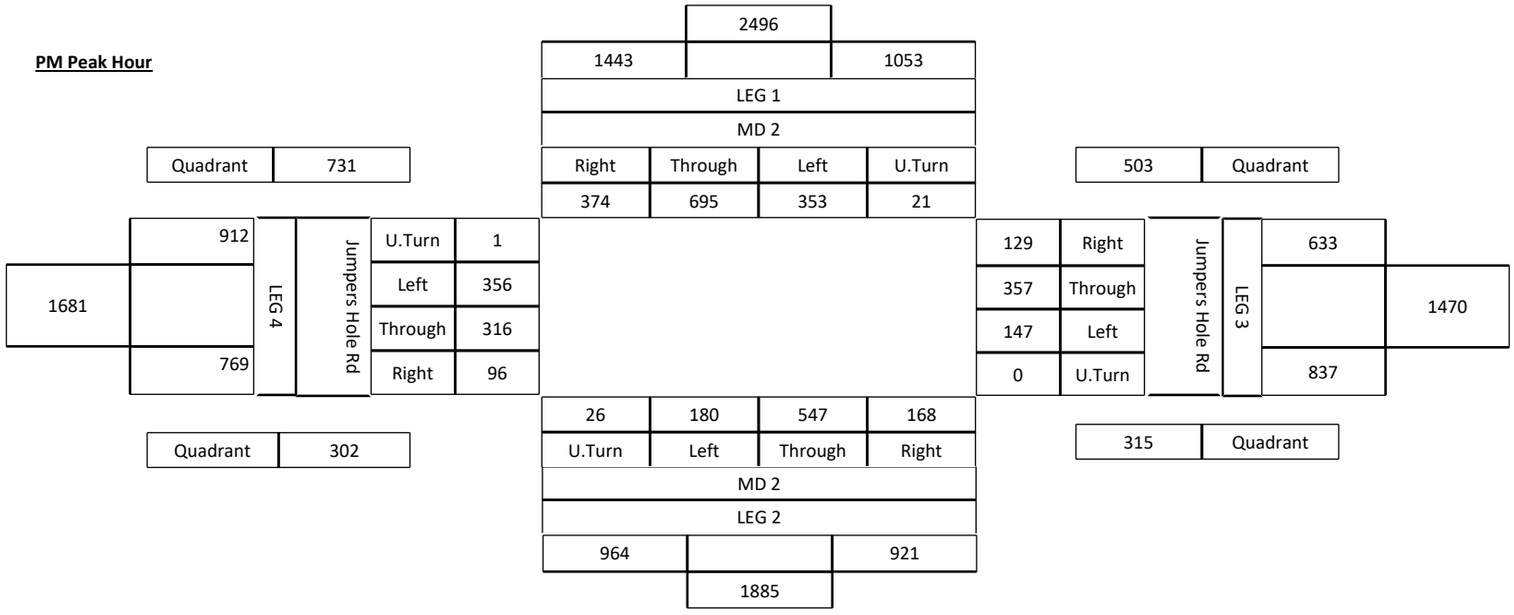
MD 2 — From North

MD 2 — From South

Jumpers Hole Rd — From East

Jumpers Hole Rd — From West

PM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2000020174 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

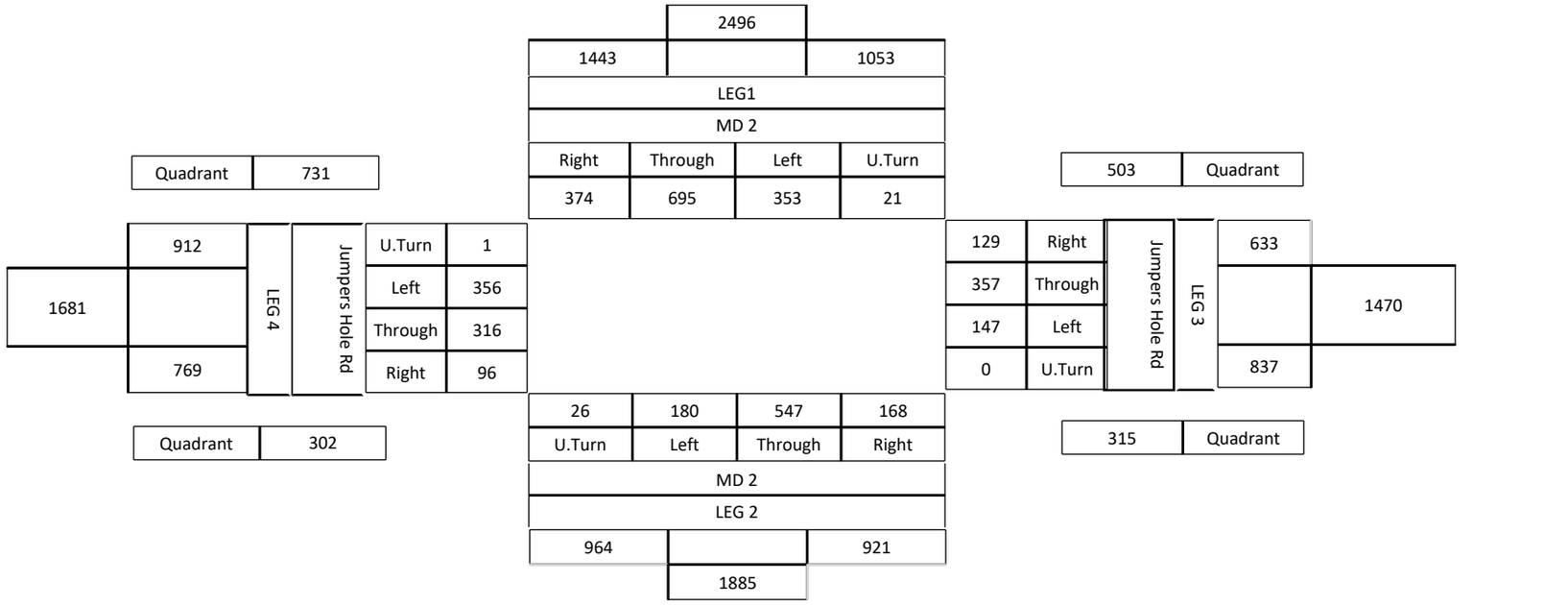
Location: MD 2 at Jumpers Hole Rd Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2719	A	0.58	12:00PM-19:00PM	17:00	17:45	3766	D	0.83

MD 2 | Jumpers Hole Rd | Jumpers Hole Rd

From North | From South | From East | From West



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064
County: Anne Arundel
Comments:

Date: 3/6/2019 12:00:00 AM
Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza
Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2					MD 2					Patriots Plaza										
Begin Hour	U.Turn	Left	Through	Right	TOTAL	U.Turn	Left	Through	Right	TOTAL	U.Turn	Left	Through	Right	TOTAL	U.Turn	Left	Through	Right	TOTAL	GrandTotal
00:00:00	0	0	22	0	22	0	0	14	1	15	0	0	0	1	1	0	0	0	0	0	38
00:15:00	0	2	24	0	26	0	0	14	0	14	0	0	0	1	1	0	0	0	0	0	41
00:30:00	0	2	20	0	22	0	0	19	1	20	0	0	0	3	3	0	0	0	0	0	45
00:45:00	0	0	12	0	12	0	0	9	1	10	0	0	0	0	0	0	0	0	0	0	22
01:00:00	0	1	12	0	13	0	0	9	0	9	0	0	0	1	1	0	0	0	0	0	23
01:15:00	0	1	6	0	7	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	15
01:30:00	0	2	8	0	10	0	0	3	0	3	0	0	0	1	1	0	0	0	0	0	14
01:45:00	0	1	10	0	11	0	0	10	0	10	0	0	0	1	1	0	0	0	0	0	22
02:00:00	1	1	22	0	24	0	0	5	1	6	0	0	0	2	2	0	0	0	0	0	32
02:15:00	0	0	5	0	5	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	12
02:30:00	1	3	9	0	13	0	0	6	0	6	0	1	0	1	2	0	0	0	0	0	21
02:45:00	0	1	9	0	10	0	0	10	1	11	0	0	0	0	0	0	0	0	0	0	21
03:00:00	0	1	7	0	8	0	0	9	1	10	0	0	0	3	3	0	0	0	0	0	21
03:15:00	0	1	6	0	7	0	0	3	2	5	0	0	0	2	2	0	0	0	0	0	14
03:30:00	0	4	10	0	14	0	0	12	1	13	0	0	0	7	7	0	0	0	0	0	34
03:45:00	1	1	13	0	15	0	0	10	1	11	0	0	0	3	3	0	0	0	0	0	29
04:00:00	0	1	17	0	18	0	0	7	3	10	0	0	0	2	2	0	0	0	0	0	30
04:15:00	0	1	16	0	17	0	0	19	3	22	0	0	0	3	3	0	0	0	0	0	42
04:30:00	0	5	23	0	28	0	0	18	3	21	0	0	0	5	5	0	0	0	0	0	54
04:45:00	0	6	37	0	43	0	0	18	7	25	0	0	0	7	7	0	0	0	0	0	75
05:00:00	0	6	33	0	39	0	0	33	4	37	0	0	0	5	5	0	0	0	0	0	81
05:15:00	0	9	37	0	46	0	0	40	13	53	0	0	0	9	9	0	0	0	0	0	108
05:30:00	0	1	65	0	66	0	0	51	7	58	0	0	0	11	11	0	0	0	0	0	135
05:45:00	0	7	63	0	70	0	0	51	8	59	0	0	0	12	12	0	0	0	0	0	141
06:00:00	0	6	78	0	84	0	0	63	7	70	0	0	0	14	14	0	0	0	0	0	168
06:15:00	1	8	78	0	87	0	0	95	10	105	0	0	0	15	15	0	0	0	0	0	207
06:30:00	2	6	124	0	132	0	0	100	12	112	0	0	0	19	19	0	0	0	0	0	263
06:45:00	1	9	161	0	171	0	0	144	12	156	0	0	0	12	12	0	0	0	0	0	339
07:00:00	0	13	136	0	149	0	0	157	19	176	0	0	0	19	19	0	0	0	0	0	344
07:15:00	0	14	129	0	143	0	0	214	24	238	0	0	0	30	30	0	0	0	0	0	411
07:30:00	0	13	153	0	166	0	0	206	10	216	0	0	0	23	23	0	0	0	0	0	405
07:45:00	1	10	170	0	181	0	0	222	17	239	0	0	0	24	24	0	0	0	0	0	444
08:00:00	2	9	170	0	181	0	0	190	25	215	0	0	0	24	24	0	0	0	0	0	420
08:15:00	4	16	170	0	190	0	0	167	18	185	0	0	0	28	28	0	0	0	0	0	403
08:30:00	4	23	178	0	205	0	0	165	17	182	0	0	0	25	25	0	0	0	0	0	412
08:45:00	3	19	170	0	192	0	0	162	17	179	0	0	0	22	22	0	0	0	0	0	393
09:00:00	6	33	158	0	197	0	0	157	21	178	0	0	0	23	23	0	0	0	0	0	398
09:15:00	3	27	166	0	196	0	0	193	15	208	0	0	0	25	25	0	0	0	0	0	429

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064
County: Anne Arundel
Comments:

Date: 3/6/2019 12:00:00 AM
Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza
Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2						MD 2						Patriots Plaza									
09:30:00	1	18	199	0	218	0	0	168	17	185	0	0	0	28	28	0	0	0	0	0	431
09:45:00	12	22	216	0	250	0	0	182	19	201	0	0	0	23	23	0	0	0	0	0	474
10:00:00	7	17	206	0	230	0	0	188	9	197	0	0	0	25	25	0	0	0	0	0	452
10:15:00	5	17	190	0	212	0	0	193	9	202	0	0	0	25	25	0	0	0	0	0	439
10:30:00	15	12	225	0	252	0	0	172	15	187	0	0	0	20	20	0	0	0	0	0	459
10:45:00	9	19	235	0	263	0	0	200	15	215	0	0	0	27	27	0	0	0	0	0	505
11:00:00	3	12	230	0	245	0	0	178	5	183	0	0	0	19	19	0	0	0	0	0	447
11:15:00	8	7	247	0	262	0	0	182	9	191	0	0	0	17	17	0	0	0	0	0	470
11:30:00	15	15	246	0	276	0	0	238	6	244	0	0	0	17	17	0	0	0	0	0	537
11:45:00	10	13	255	0	278	0	0	193	5	198	0	0	0	16	16	0	0	0	0	0	492
12:00:00	11	15	269	0	295	0	0	214	11	225	0	0	0	23	23	0	0	0	0	0	543
12:15:00	9	8	250	0	267	0	0	196	8	204	0	0	0	17	17	0	0	0	0	0	488
12:30:00	14	16	243	0	273	0	0	208	19	227	0	0	0	19	19	0	0	0	0	0	519
12:45:00	13	16	242	0	271	0	0	233	8	241	0	0	0	25	25	0	0	0	0	0	537
13:00:00	14	14	258	0	286	0	0	215	11	226	0	0	0	27	27	0	0	0	0	0	539
13:15:00	7	11	276	0	294	0	0	248	10	258	0	0	0	17	17	0	0	0	0	0	569
13:30:00	13	10	233	0	256	0	0	210	12	222	0	0	0	16	16	0	0	0	0	0	494
13:45:00	12	13	289	0	314	0	0	205	16	221	0	0	0	27	27	0	0	0	0	0	562
14:00:00	6	14	277	0	297	0	0	251	10	261	0	0	0	18	18	0	0	0	0	0	576
14:15:00	10	16	252	0	278	0	0	189	8	197	0	0	0	18	18	0	0	0	0	0	493
14:30:00	10	11	310	0	331	0	0	194	6	200	0	0	0	25	25	0	0	0	0	0	556
14:45:00	16	11	334	0	361	0	0	181	14	195	0	0	0	23	23	0	0	0	0	0	579
15:00:00	10	16	322	0	348	0	0	231	7	238	0	0	0	20	20	0	0	0	0	0	606
15:15:00	12	10	332	0	354	0	0	229	4	233	0	0	0	16	16	0	0	0	0	0	603
15:30:00	15	7	340	0	362	0	0	228	8	236	0	0	0	17	17	0	0	0	0	0	615
15:45:00	8	10	303	0	321	0	0	233	10	243	0	0	0	17	17	0	0	0	0	0	581
16:00:00	10	17	297	0	324	0	0	199	5	204	0	0	0	18	18	0	0	0	0	0	546
16:15:00	13	22	325	0	360	0	0	269	10	279	0	0	0	18	18	0	0	0	0	0	657
16:30:00	19	14	325	0	358	0	0	265	6	271	0	0	0	17	17	0	0	0	0	0	646
16:45:00	11	9	350	0	370	0	0	267	6	273	0	0	0	8	8	0	0	0	0	0	651
17:00:00	33	12	377	0	422	0	0	279	13	292	0	0	0	13	13	0	0	0	0	0	727
17:15:00	13	19	387	0	419	0	0	224	11	235	0	0	0	21	21	0	0	0	0	0	675
17:30:00	12	15	374	0	401	0	0	281	5	286	0	0	0	16	16	0	0	0	0	0	703
17:45:00	12	7	358	0	377	0	0	249	12	261	0	0	0	21	21	0	0	0	0	0	659
18:00:00	14	16	319	0	349	0	0	222	11	233	0	0	0	11	11	0	0	0	0	0	593
18:15:00	12	16	307	0	335	0	0	241	5	246	0	0	0	12	12	0	0	0	0	0	593
18:30:00	13	8	266	0	287	0	0	212	2	214	0	0	0	20	20	0	0	0	0	0	521
18:45:00	5	9	224	0	238	0	0	191	3	194	0	0	0	15	15	0	0	0	0	0	447
19:00:00	5	5	237	0	247	0	0	190	5	195	0	0	0	15	15	0	0	0	0	0	457
19:15:00	8	10	234	0	252	0	0	196	5	201	0	0	0	17	17	0	0	0	0	0	470

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2						MD 2						Patriots Plaza									
19:30:00	12	5	195	0	212	0	0	152	3	155	0	0	0	29	29	0	0	0	0	0	396
19:45:00	7	3	173	0	183	0	0	154	4	158	0	0	0	5	5	0	0	0	0	0	346
20:00:00	10	5	183	0	198	0	0	126	1	127	0	0	0	7	7	0	0	0	0	0	332
20:15:00	6	2	153	0	161	0	0	141	2	143	0	0	0	4	4	0	0	0	0	0	308
20:30:00	4	4	119	0	127	0	0	114	2	116	0	0	0	8	8	0	0	0	0	0	251
20:45:00	3	3	122	0	128	0	0	87	1	88	0	0	0	7	7	0	0	0	0	0	223
21:00:00	9	2	130	0	141	0	0	138	3	141	0	0	0	5	5	0	0	0	0	0	287
21:15:00	0	0	115	0	115	0	0	90	1	91	0	0	0	8	8	0	0	0	0	0	214
21:30:00	1	4	95	0	100	0	0	83	7	90	0	0	0	4	4	0	0	0	0	0	194
21:45:00	3	5	89	0	97	0	0	71	0	71	0	0	0	5	5	0	0	0	0	0	173
22:00:00	7	1	65	0	73	0	0	62	2	64	0	0	0	2	2	0	0	0	0	0	139
22:15:00	1	3	60	0	64	0	0	60	0	60	0	0	0	2	2	0	0	0	0	0	126
22:30:00	4	1	51	0	56	0	0	43	0	43	0	0	0	1	1	0	0	0	0	0	100
22:45:00	0	0	24	0	24	0	0	43	0	43	0	0	0	2	2	0	0	0	0	0	69
23:00:00	1	1	45	0	47	0	0	42	2	44	0	0	0	3	3	0	0	0	0	0	94
23:15:00	0	1	36	0	37	0	0	31	0	31	0	0	0	2	2	0	0	0	0	0	70
23:30:00	3	3	33	0	39	0	0	22	1	23	0	0	0	0	0	0	0	0	0	0	62
23:45:00	3	0	20	0	23	0	0	16	0	16	0	0	0	1	1	0	0	0	0	0	40
TOTAL	**549**	**835**	**15394**	**0**	**16778**	**0**	**0**	**12739**	**681**	**13420**	**0**	**1**	**0**	**1242**	**1243**	**0**	**0**	**0**	**0**	**0**	**31441**
AMPEAK	**44**	**50**	**1017**	**0**	**1111**	**0**	**0**	**827**	**31**	**858**	**0**	**0**	**0**	**73**	**73**	**0**	**0**	**0**	**0**	**0**	**2042**
PMPEAK	**70**	**53**	**1496**	**0**	**1619**	**0**	**0**	**1033**	**41**	**1074**	**0**	**0**	**0**	**71**	**71**	**0**	**0**	**0**	**0**	**0**	**2764**
DAYPEAK	**70**	**53**	**1496**	**0**	**1619**	**0**	**0**	**1033**	**41**	**1074**	**0**	**0**	**0**	**71**	**71**	**0**	**0**	**0**	**0**	**0**	**2764**

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2			MD 2			Patriots Plaza					
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
00:00:00	0	0	0	0	0	0	0	0	0	0	0	0
00:15:00	0	0	0	0	0	0	0	0	0	0	0	0
00:30:00	0	0	0	0	0	0	0	0	0	0	0	0
00:45:00	0	0	0	0	0	0	0	0	0	0	0	0
01:00:00	0	0	0	0	0	0	0	0	0	0	0	0
01:15:00	0	0	0	0	0	0	0	0	0	0	0	0
01:30:00	0	0	0	0	0	0	0	0	0	0	0	0
01:45:00	0	0	0	0	0	0	0	0	0	0	0	0
02:00:00	0	0	0	0	0	0	0	0	0	0	0	0
02:15:00	0	0	0	0	0	0	0	0	0	0	0	0
02:30:00	0	0	0	0	0	0	0	0	0	0	0	0
02:45:00	0	0	0	0	0	0	0	0	0	0	0	0
03:00:00	0	0	0	0	0	0	0	0	0	0	0	0
03:15:00	0	0	0	0	0	0	0	0	0	0	0	0
03:30:00	0	0	0	0	0	0	0	0	0	0	0	0
03:45:00	0	0	0	0	0	0	0	0	0	0	0	0
04:00:00	0	0	0	0	0	0	0	0	0	0	0	0
04:15:00	0	0	0	0	0	0	0	0	0	0	0	0
04:30:00	0	0	0	0	0	0	0	0	0	0	0	0
04:45:00	0	0	0	0	0	0	0	0	0	0	0	0
05:00:00	0	0	0	0	0	0	0	0	0	0	0	0
05:15:00	0	0	0	0	0	0	0	1	0	0	0	0
05:30:00	0	0	0	0	0	0	0	0	0	0	0	0
05:45:00	0	0	0	0	0	0	0	0	0	0	0	0
06:00:00	0	0	0	0	0	0	0	0	0	0	0	0
06:15:00	0	0	0	0	0	0	0	0	0	0	0	0
06:30:00	0	0	0	0	0	0	0	0	0	0	0	0
06:45:00	0	0	0	0	0	0	0	0	0	0	0	0
07:00:00	0	0	0	0	0	0	0	0	0	0	0	0
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0
07:30:00	0	0	0	0	0	0	0	0	0	0	0	0
07:45:00	0	0	0	0	0	0	0	0	0	0	0	0
08:00:00	0	0	0	0	0	0	0	0	0	0	0	0
08:15:00	0	0	0	0	0	0	0	0	0	0	0	0
08:30:00	0	0	0	0	0	0	0	0	0	0	0	0
08:45:00	0	0	0	0	0	0	0	0	0	0	0	0
09:00:00	0	0	0	0	0	0	0	0	0	0	0	0
09:15:00	0	0	0	0	0	0	0	0	0	0	0	0

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2			MD 2			Patriots Plaza					
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
09:30:00	0	0	0	0	1	0	0	0	0	0	0	0
09:45:00	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	1	0	0	0	0
10:30:00	0	0	0	0	0	0	0	0	0	0	0	0
10:45:00	0	0	0	0	0	0	0	0	0	0	0	0
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	1	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	1	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	2	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	1	0	0	0	0
13:15:00	0	0	0	0	2	0	0	2	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	0	0
14:15:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30:00	0	0	0	0	0	0	0	0	0	0	0	0
14:45:00	0	0	0	0	1	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	1	0	0	0	0	0	0	0
15:30:00	0	0	0	0	1	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	1	0	0	1	0	0	0	0
16:30:00	0	0	0	0	0	0	0	1	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	1	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	1	0	0	0	0
18:00:00	0	0	0	0	0	0	0	1	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	1	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

	MD 2			MD 2			Patriots Plaza					
Begin Hour	**School Children**	**Pedestrians**	**Bicycles**	**School Childer**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**	**School Children**	**Pedestrians**	**Bicycles**
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	0	0	0	0	0
19:30:00	0	0	0	0	0	0	0	0	0	0	0	0
19:45:00	0	0	0	0	0	0	0	0	0	0	0	0
20:00:00	0	0	0	0	0	0	0	0	0	0	0	0
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30:00	0	0	0	0	0	0	0	0	0	0	0	0
20:45:00	0	0	0	0	0	0	0	2	0	0	0	0
21:00:00	0	0	0	0	0	0	0	0	0	0	0	0
21:15:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30:00	0	0	0	0	0	0	0	0	0	0	0	0
21:45:00	0	0	0	0	0	0	0	1	0	0	0	0
22:00:00	0	0	0	0	0	0	0	0	0	0	0	0
22:15:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30:00	0	0	0	0	0	0	0	0	0	0	0	0
22:45:00	0	0	0	0	0	0	0	0	0	0	0	0
23:00:00	0	0	0	0	0	0	0	0	0	0	0	0
23:15:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30:00	0	0	0	0	0	0	0	0	0	0	0	0
23:45:00	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**15**	**0**	**0**	**0**	**0**
AMPEAK	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
PMPEAK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
DAYPEAK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

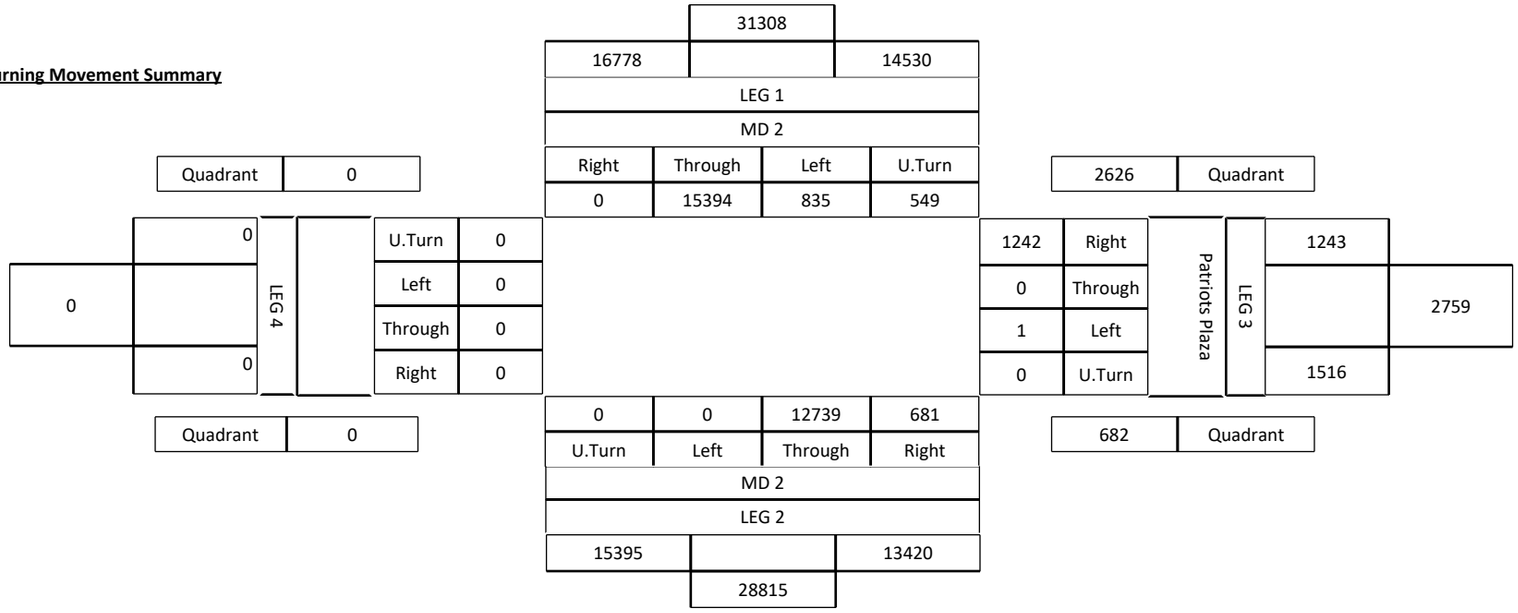
Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

MD 2 | MD 2 | Patriots Plaza

Turning Movement Summary



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

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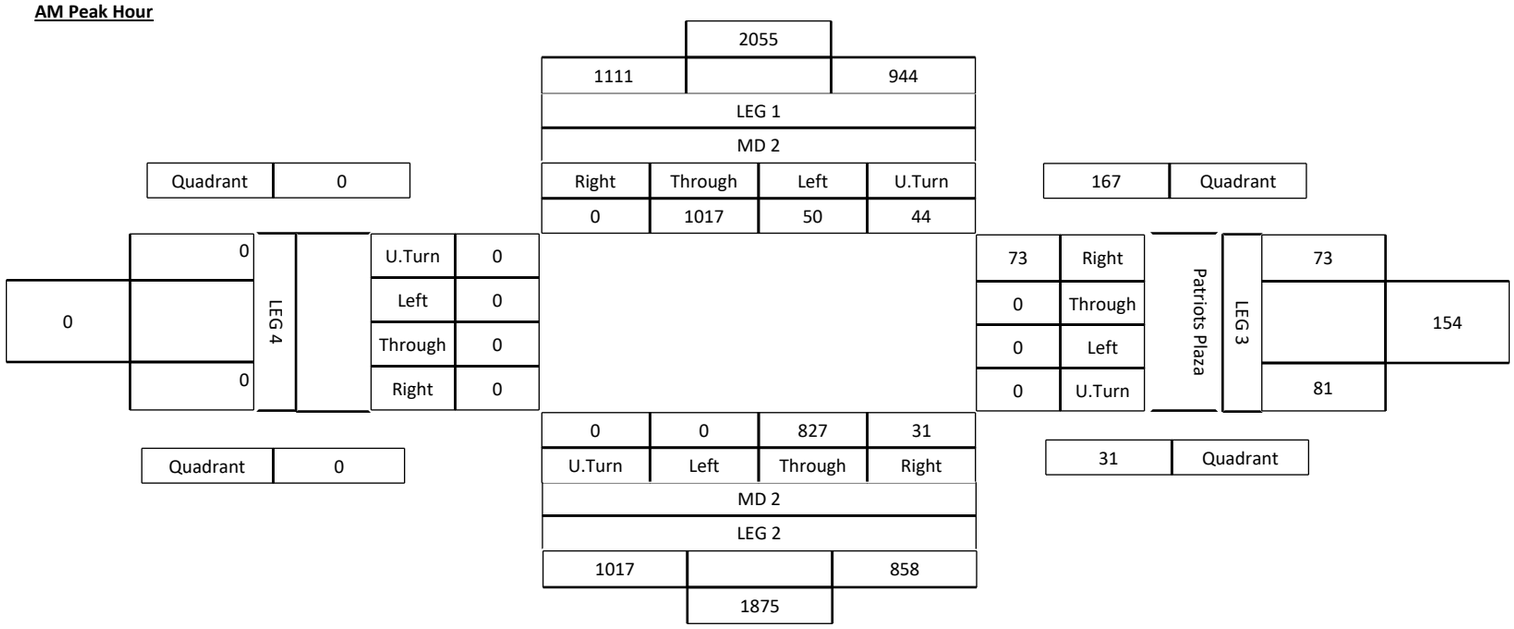
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

MD 2 | MD 2 | Patriots Plaza

AM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

Station ID: S2019020064 | County: Anne Arundel | Comments:

Date: 3/6/2019 12:00:00 AM | Town: none

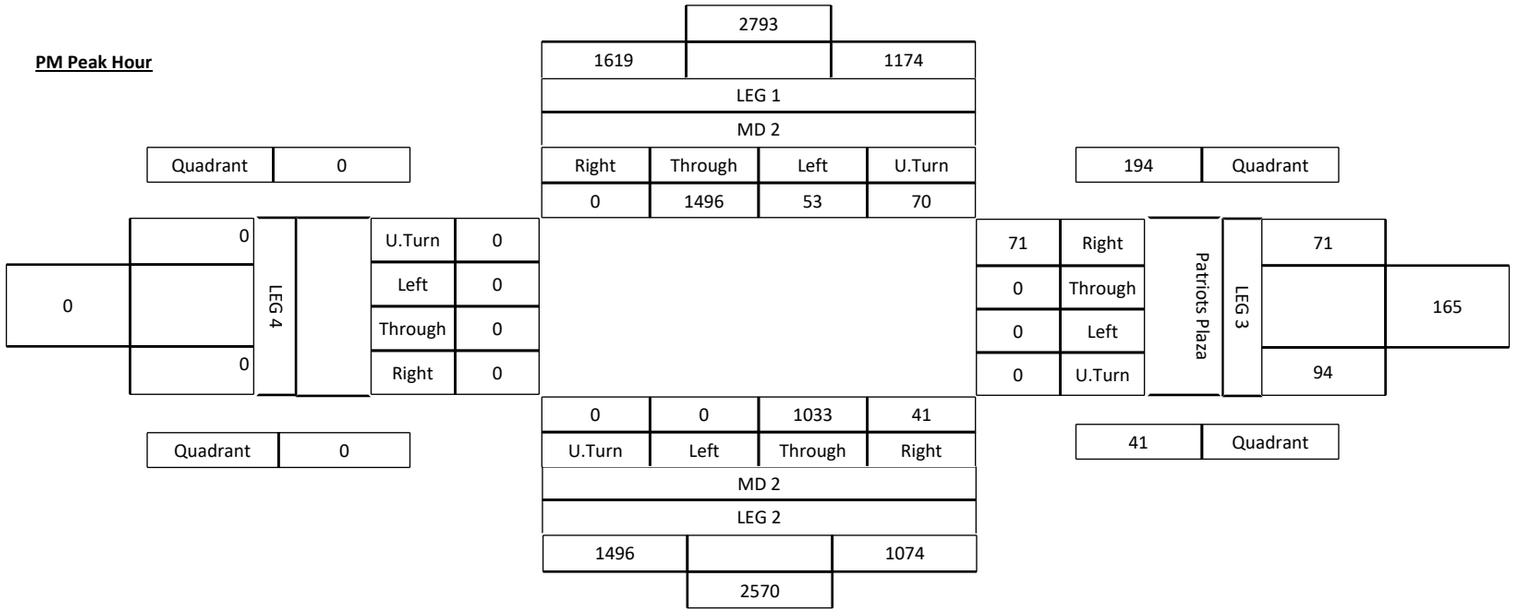
Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza | Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39

MD 2 | MD 2 | Patriots Plaza

PM Peak Hour



Maryland Department of Transportation
State Highway Administration
Data Services Division

Turning Movement Summary Report

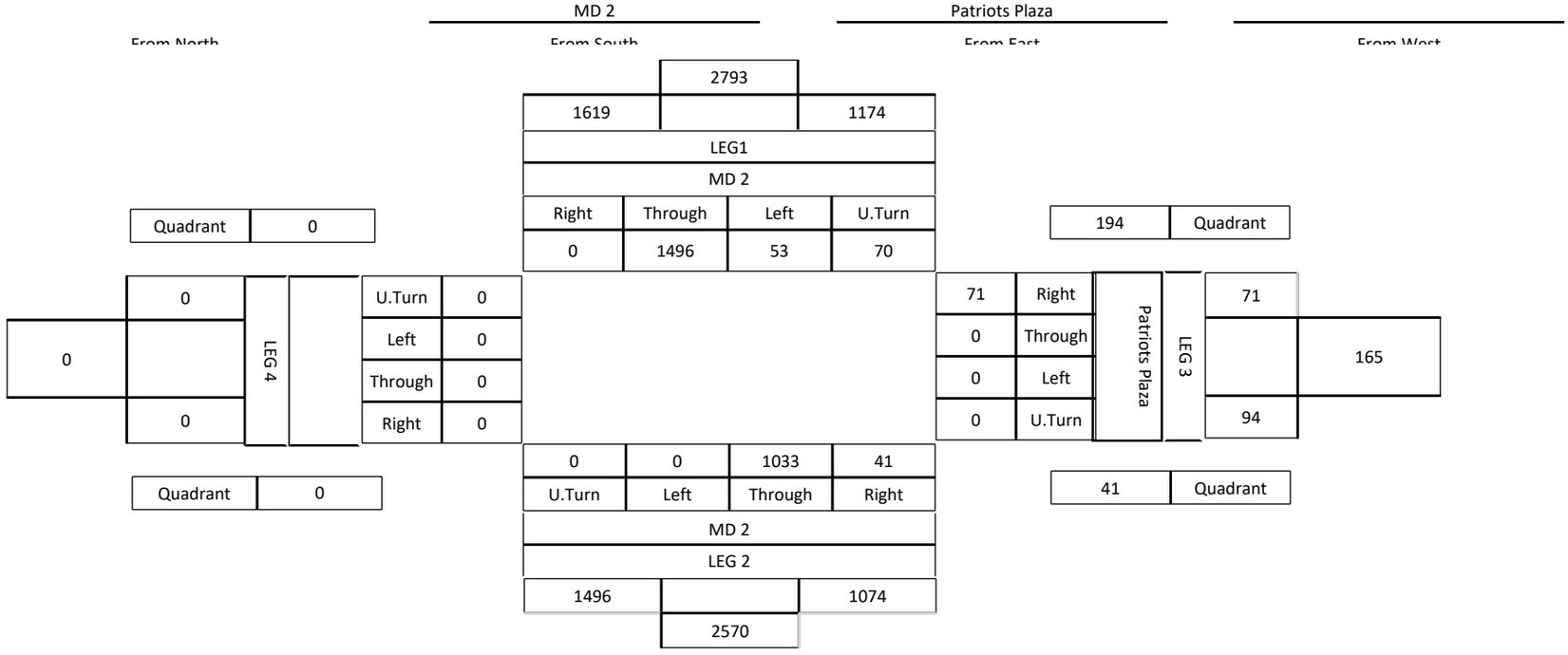
Station ID: S2019020064 County: Anne Arundel Comments:

Date: 3/6/2019 12:00:00 AM Town: none

Location: MD 2 at Median Crossover 50ft north of Entrance to Patriots Plaza Weather: Clear

Interval: 60 Min

PEAK	AM PERIOD	Start	End	Volume	LOS	V/C	PM PERIOD	Start	End	Volume	LOS	V/C
Hours	6:00AM-12:00PM	11:15	12:00	2042	A	0.28	12:00PM-19:00PM	17:00	17:45	2764	A	0.39



Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather: SUNNY
Counted By: GARY
Town:
Country: ANNE ARUNDEL

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

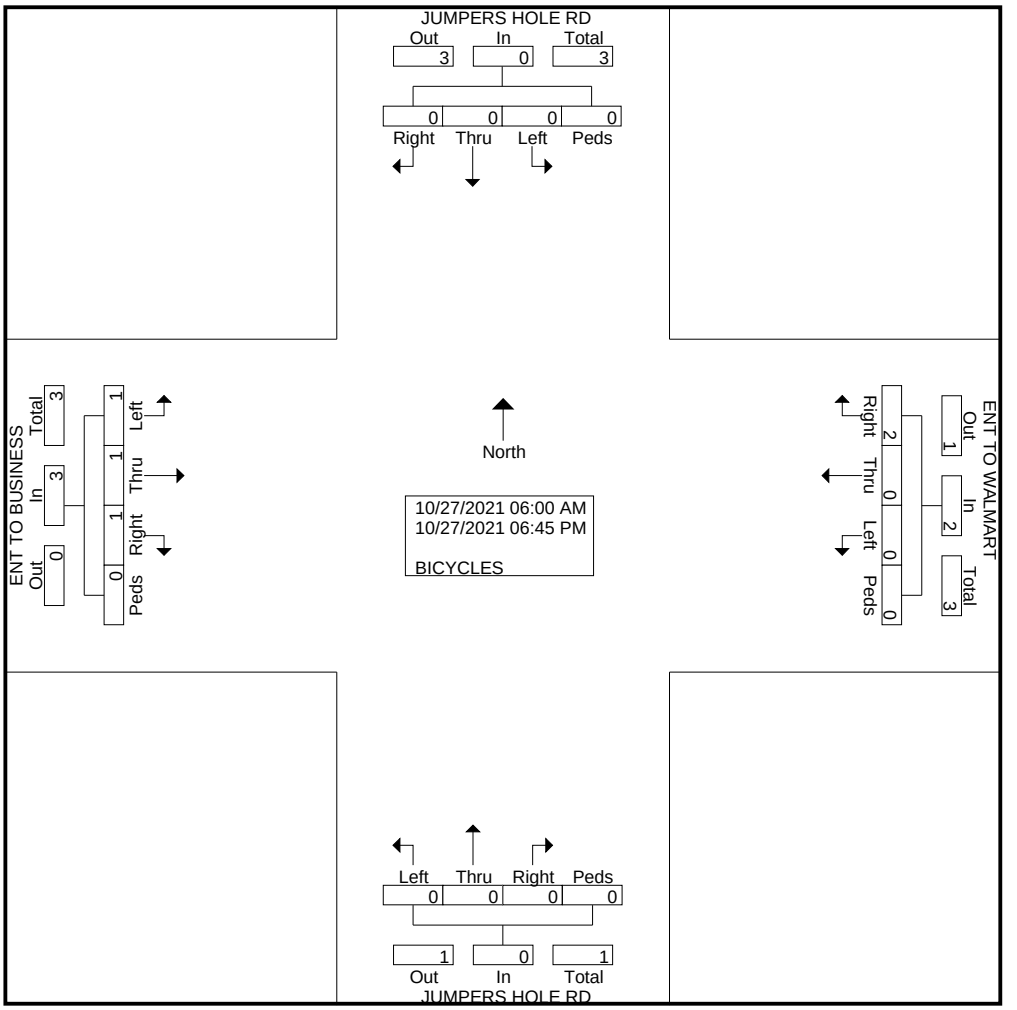
Groups Printed- BICYCLES

	JUMPERS HOLE RD From North					ENT TO WALMART From East					JUMPERS HOLE RD From South					ENT TO BUSINESS From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
*** BREAK ***																					
06:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	2
*** BREAK ***																					
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	2
*** BREAK ***																					
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
*** BREAK ***																					
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
*** BREAK ***																					
04:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Grand Total	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	1	1	0	3	5
Apprch %	0	0	0	0		0	0	100	0		0	0	0	0		33.3	33.3	33.3	0		
Total %	0	0	0	0	0	0	0	40	0	40	0	0	0	0	0	20	20	20	0	60	

Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 2



Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather: SUNNY
Counted By: GARY
Town:
Country: ANNE ARUNDEL

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					ENT TO WALMART From East					JUMPERS HOLE RD From South					ENT TO BUSINESS From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	4	58	2	0	64	2	0	0	0	2	0	20	1	0	21	4	1	3	1	9	96
06:15 AM	12	77	2	0	91	2	0	4	0	6	0	30	1	0	31	4	0	1	0	5	133
06:30 AM	15	90	5	0	110	5	0	4	0	9	0	30	2	0	32	1	0	3	0	4	155
06:45 AM	20	108	4	1	133	7	0	12	1	20	0	47	3	0	50	3	3	2	0	8	211
Total	51	333	13	1	398	16	0	20	1	37	0	127	7	0	134	12	4	9	1	26	595
07:00 AM	16	135	6	2	159	11	0	13	0	24	0	53	4	0	57	2	0	4	0	6	246
07:15 AM	15	154	4	0	173	7	1	9	0	17	2	61	2	0	65	0	1	2	0	3	258
07:30 AM	23	129	9	0	161	5	0	11	0	16	0	72	2	0	74	5	0	2	0	7	258
07:45 AM	27	153	8	0	188	9	1	11	0	21	2	81	2	1	86	5	2	4	0	11	306
Total	81	571	27	2	681	32	2	44	0	78	4	267	10	1	282	12	3	12	0	27	1068
08:00 AM	23	118	6	0	147	5	0	11	0	16	1	71	2	0	74	8	1	5	0	14	251
08:15 AM	22	119	1	0	142	11	0	13	0	24	0	74	5	0	79	2	1	8	0	11	256
08:30 AM	24	83	7	1	115	15	1	14	0	30	3	79	9	0	91	11	1	7	0	19	255
08:45 AM	37	133	8	0	178	9	0	15	0	24	6	82	8	1	97	3	0	6	0	9	308
Total	106	453	22	1	582	40	1	53	0	94	10	306	24	1	341	24	3	26	0	53	1070
09:00 AM	44	91	9	0	144	10	1	12	0	23	1	73	7	0	81	6	4	4	0	14	262
09:15 AM	53	107	7	2	169	12	1	21	0	34	7	95	10	0	112	14	3	4	0	21	336
09:30 AM	50	110	8	0	168	16	0	18	0	34	11	114	3	0	128	9	2	9	0	20	350
09:45 AM	41	94	5	0	140	34	3	26	0	63	9	84	8	0	101	8	6	9	0	23	327
Total	188	402	29	2	621	72	5	77	0	154	28	366	28	0	422	37	15	26	0	78	1275
10:00 AM	41	88	6	0	135	27	0	18	0	45	4	93	10	1	108	6	3	3	0	12	300
10:15 AM	37	107	6	0	150	15	2	22	0	39	1	114	11	0	126	8	5	7	0	20	335
10:30 AM	58	95	0	0	153	21	3	36	1	61	4	95	7	0	106	4	2	8	0	14	334
10:45 AM	46	125	4	0	175	15	2	22	0	39	4	112	6	0	122	1	2	8	0	11	347
Total	182	415	16	0	613	78	7	98	1	184	13	414	34	1	462	19	12	26	0	57	1316
11:00 AM	39	89	0	0	128	27	1	21	1	50	3	127	12	0	142	7	2	4	0	13	333
11:15 AM	45	98	1	0	144	21	1	24	0	46	3	112	5	0	120	8	2	7	0	17	327
11:30 AM	43	104	5	1	153	22	1	31	2	56	3	119	13	0	135	5	3	8	0	16	360
11:45 AM	43	93	3	0	139	18	2	35	0	55	0	134	8	0	142	14	2	13	0	29	365
Total	170	384	9	1	564	88	5	111	3	207	9	492	38	0	539	34	9	32	0	75	1385
12:00 PM	49	117	2	0	168	22	0	26	0	48	6	136	12	0	154	6	4	8	0	18	388
12:15 PM	53	103	2	1	159	29	3	19	0	51	8	136	7	0	151	6	2	8	0	16	377
12:30 PM	55	116	3	0	174	26	0	33	1	60	2	151	7	0	160	10	4	6	0	20	414
12:45 PM	55	118	1	1	175	25	2	26	0	53	3	148	8	0	159	8	5	18	0	31	418
Total	212	454	8	2	676	102	5	104	1	212	19	571	34	0	624	30	15	40	0	85	1597
01:00 PM	60	95	5	0	160	25	3	24	0	52	1	135	13	0	149	5	4	5	0	14	375
01:15 PM	49	115	2	0	166	21	1	26	0	48	2	151	4	0	157	4	0	4	0	8	379
01:30 PM	44	112	7	1	164	19	0	32	0	51	4	141	8	0	153	9	1	5	0	15	383
01:45 PM	66	91	5	0	162	21	4	37	0	62	2	126	15	0	143	8	1	8	0	17	384
Total	219	413	19	1	652	86	8	119	0	213	9	553	40	0	602	26	6	22	0	54	1521
02:00 PM	37	93	6	1	137	21	0	37	0	58	1	126	7	0	134	7	5	5	0	17	346
02:15 PM	29	108	4	0	141	18	0	17	0	35	4	151	6	0	161	6	3	3	0	12	349
02:30 PM	48	105	1	2	156	28	3	29	0	60	3	157	7	0	167	12	6	4	0	22	405

Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					ENT TO WALMART From East					JUMPERS HOLE RD From South					ENT TO BUSINESS From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:45 PM	41	88	5	0	134	19	2	42	0	63	4	150	4	0	158	10	3	4	0	17	372
Total	155	394	16	3	568	86	5	125	0	216	12	584	24	0	620	35	17	16	0	68	1472
03:00 PM	36	98	1	0	135	29	2	37	1	69	1	141	8	0	150	8	1	3	0	12	366
03:15 PM	46	104	2	0	152	25	1	29	0	55	1	155	11	0	167	5	5	8	0	18	392
03:30 PM	40	118	4	0	162	23	1	36	0	60	1	165	8	0	174	7	2	2	0	11	407
03:45 PM	51	125	3	0	179	19	3	33	0	55	4	155	14	0	173	6	4	3	0	13	420
Total	173	445	10	0	628	96	7	135	1	239	7	616	41	0	664	26	12	16	0	54	1585
04:00 PM	50	123	4	0	177	27	1	44	0	72	2	170	8	1	181	13	4	5	0	22	452
04:15 PM	44	118	5	0	167	31	0	25	0	56	2	177	6	0	185	5	1	7	0	13	421
04:30 PM	44	111	6	0	161	19	2	46	0	67	4	172	10	0	186	15	3	6	0	24	438
04:45 PM	48	130	3	0	181	19	2	37	0	58	2	175	12	0	189	9	0	0	0	9	437
Total	186	482	18	0	686	96	5	152	0	253	10	694	36	1	741	42	8	18	0	68	1748
05:00 PM	48	141	11	0	200	19	0	47	0	66	4	175	5	0	184	8	3	3	1	15	465
05:15 PM	49	127	11	1	188	16	2	36	0	54	2	211	6	1	220	5	4	6	0	15	477
05:30 PM	61	132	9	0	202	21	1	36	0	58	2	197	6	0	205	7	1	3	0	11	476
05:45 PM	62	110	0	0	172	22	1	53	0	76	2	170	6	0	178	11	3	5	0	19	445
Total	220	510	31	1	762	78	4	172	0	254	10	753	23	1	787	31	11	17	1	60	1863
06:00 PM	54	118	2	0	174	31	3	40	0	74	9	189	3	0	201	10	6	0	0	16	465
06:15 PM	53	121	3	1	178	23	2	47	0	72	3	198	7	0	208	6	2	5	0	13	471
06:30 PM	47	102	2	0	151	16	0	20	0	36	3	185	13	0	201	8	3	5	0	16	404
06:45 PM	63	105	3	0	171	16	1	40	0	57	2	178	8	0	188	7	2	0	0	9	425
Total	217	446	10	1	674	86	6	147	0	239	17	750	31	0	798	31	13	10	0	54	1765
Grand Total	2160	5702	228	15	8105	956	60	1357	7	2380	148	6493	370	5	7016	359	128	270	2	759	18260
Apprch %	26.7	70.4	2.8	0.2		40.2	2.5	57	0.3		2.1	92.5	5.3	0.1		47.3	16.9	35.6	0.3		
Total %	11.8	31.2	1.2	0.1	44.4	5.2	0.3	7.4	0	13	0.8	35.6	2	0	38.4	2	0.7	1.5	0	4.2	

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7055 Samuel Morse Dr. Ste. 100
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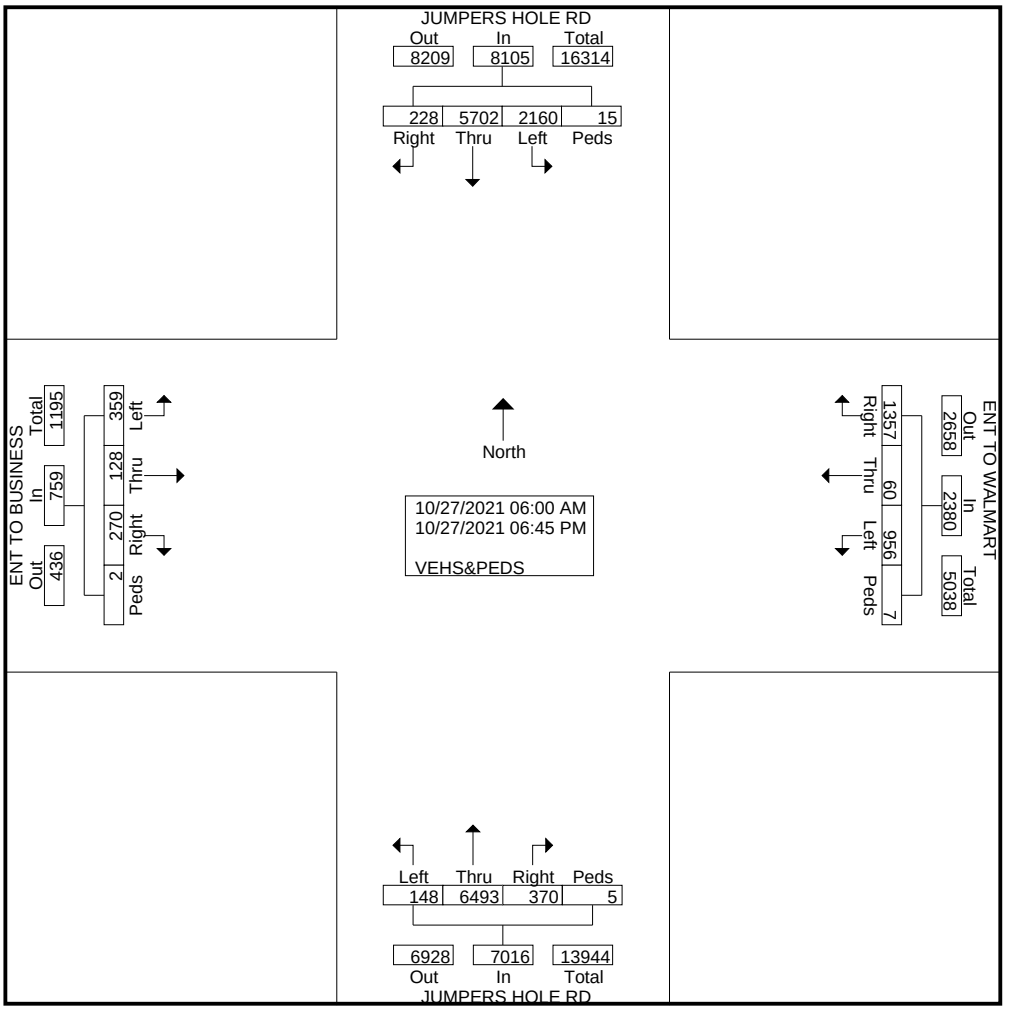
443-741-3500

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 3



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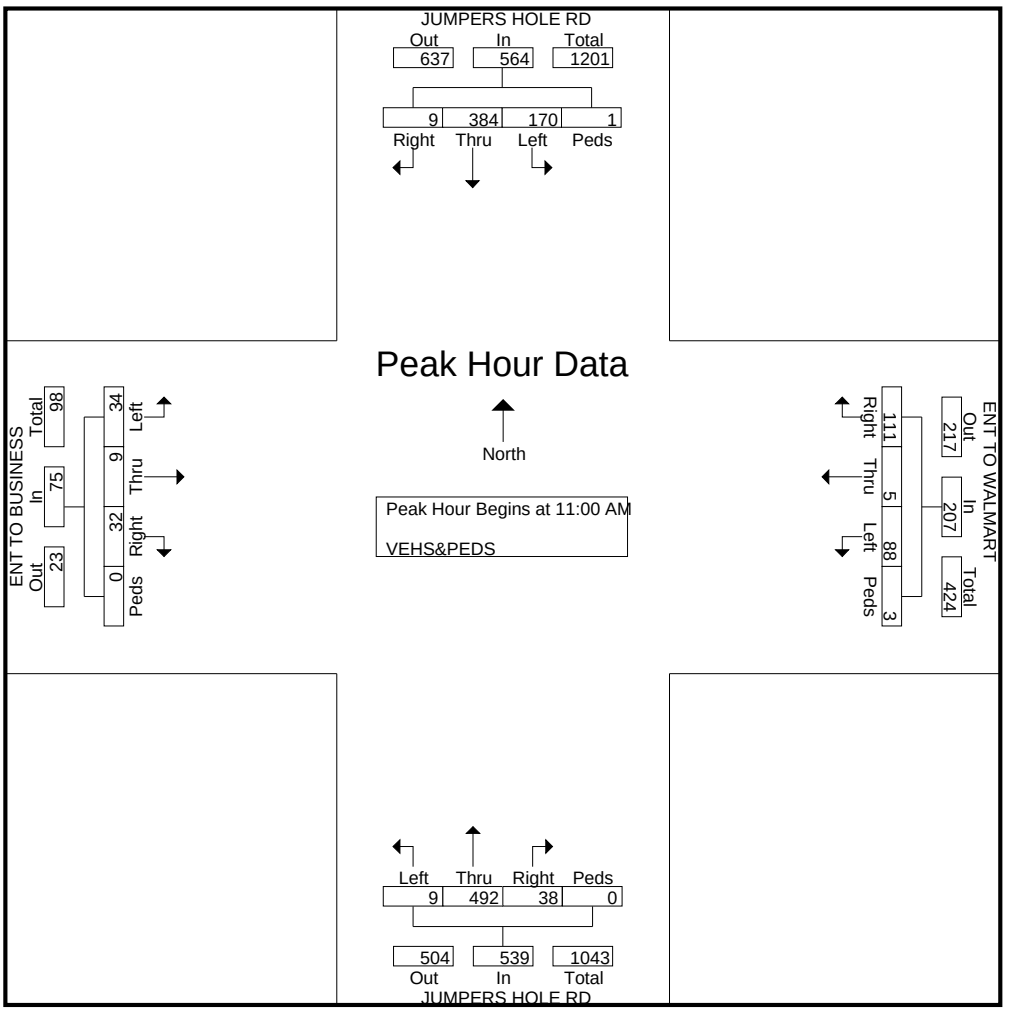
443-741-3500

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 4

	JUMPERS HOLE RD From North					ENT TO WALMART From East					JUMPERS HOLE RD From South					ENT TO BUSINESS From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	39	89	0	0	128	**27**	1	21	1	50	**3**	127	12	0	**142**	7	2	4	0	13	333
11:15 AM	**45**	98	1	0	144	21	1	24	0	46	3	112	5	0	120	8	2	7	0	17	327
11:30 AM	43	**104**	**5**	**1**	**153**	22	1	31	**2**	**56**	3	119	**13**	0	135	5	**3**	8	0	16	360
11:45 AM	43	93	3	0	139	18	**2**	**35**	0	55	0	**134**	8	0	142	**14**	2	**13**	0	**29**	**365**
Total Volume	170	384	9	1	564	88	5	111	3	207	9	492	38	0	539	34	9	32	0	75	1385
% App. Total	30.1	68.1	1.6	0.2		42.5	2.4	53.6	1.4		1.7	91.3	7.1	0		45.3	12	42.7	0		
PHF	.944	.923	.450	.250	.922	.815	.625	.793	.375	.924	.750	.918	.731	.000	.949	.607	.750	.615	.000	.647	.949



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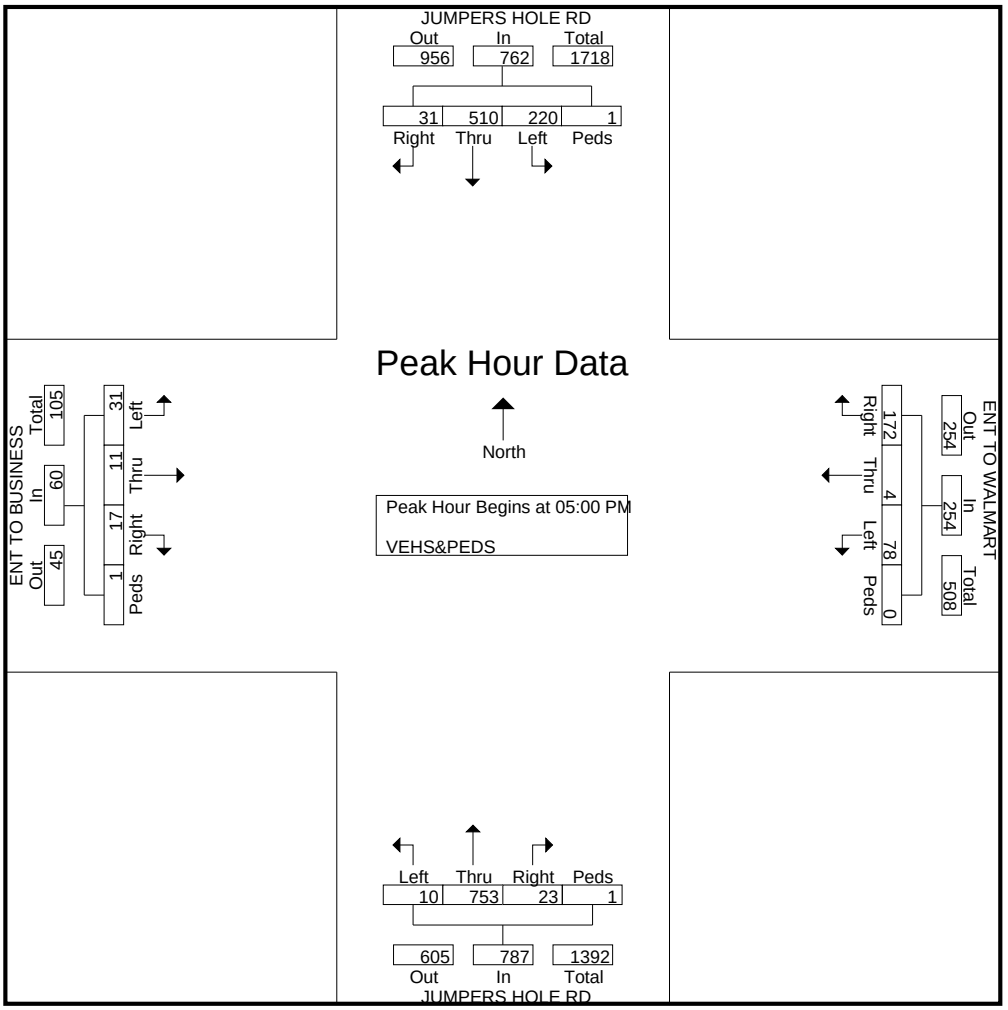
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT ENT TO WALMART
Site Code : 00000000
Start Date : 10/27/2021
Page No : 5

	JUMPERS HOLE RD From North					ENT TO WALMART From East					JUMPERS HOLE RD From South					ENT TO BUSINESS From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	48	**141**	**11**	0	200	19	0	47	0	66	**4**	175	5	0	184	8	3	3	**1**	15	465
05:15 PM	49	127	11	**1**	188	16	**2**	36	0	54	2	**211**	**6**	**1**	**220**	5	**4**	**6**	0	15	**477**
05:30 PM	61	132	9	0	**202**	21	1	36	0	58	2	197	6	0	205	7	1	3	0	11	476
05:45 PM	**62**	110	0	0	172	**22**	1	**53**	0	**76**	2	170	6	0	178	**11**	3	5	0	**19**	445
Total Volume	220	510	31	1	762	78	4	172	0	254	10	753	23	1	787	31	11	17	1	60	1863
% App. Total	28.9	66.9	4.1	0.1		30.7	1.6	67.7	0		1.3	95.7	2.9	0.1		51.7	18.3	28.3	1.7		
PHF	.887	.904	.705	.250	.943	.886	.500	.811	.000	.836	.625	.892	.958	.250	.894	.705	.688	.708	.250	.789	.976



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7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather:CLEAR
Counted By: DON
Town:
Country: ANNE ARUNDEL

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

Groups Printed- BICYCLES

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
*** BREAK ***																					
11:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
*** BREAK ***																					
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
02:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
*** BREAK ***																					
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
*** BREAK ***																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	1	0	2	0	0	2	0	0	0	0	0	3
*** BREAK ***																					
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Grand Total	0	2	0	0	2	0	0	0	2	2	0	8	0	0	8	0	0	0	1	1	13
Apprch %	0	100	0	0		0	0	0	100		0	100	0	0		0	0	0	100		
Total %	0	15.4	0	0	15.4	0	0	0	15.4	15.4	0	61.5	0	0	61.5	0	0	0	7.7	7.7	

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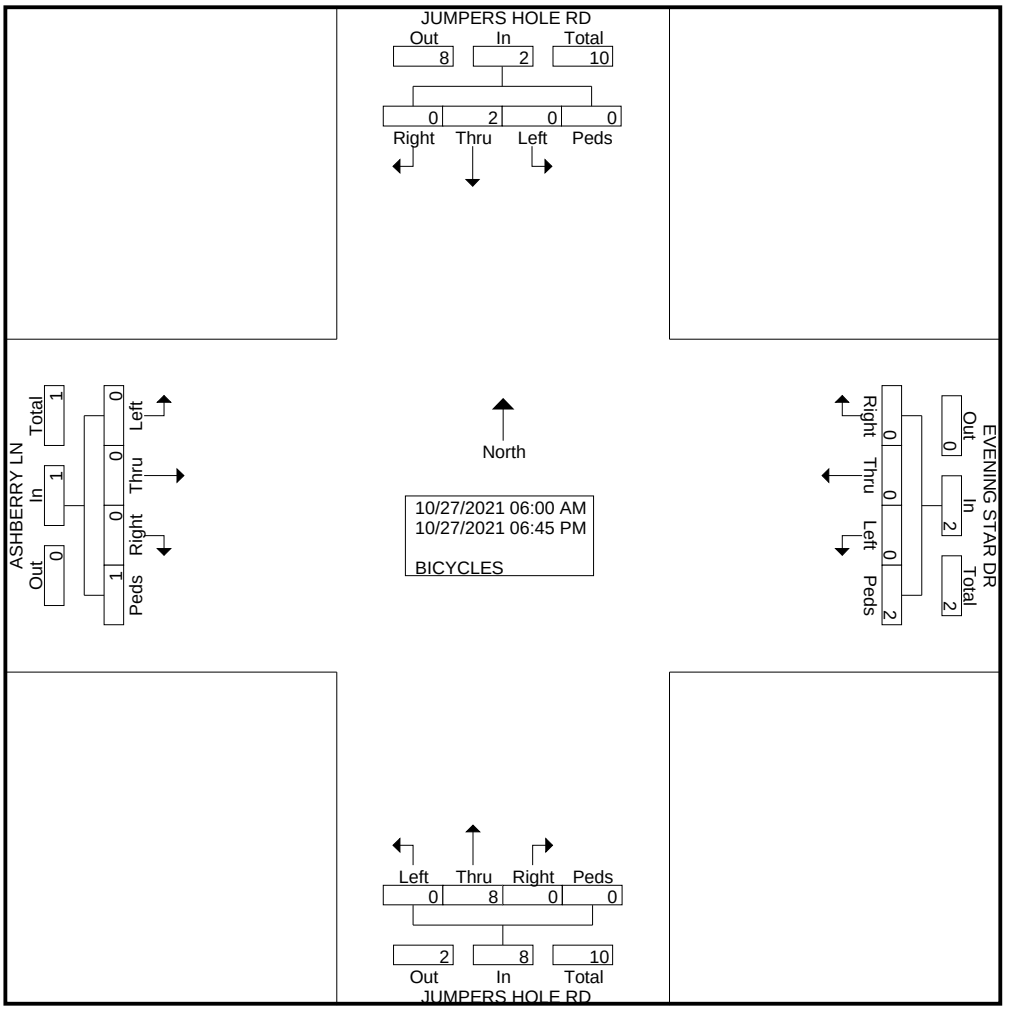
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021



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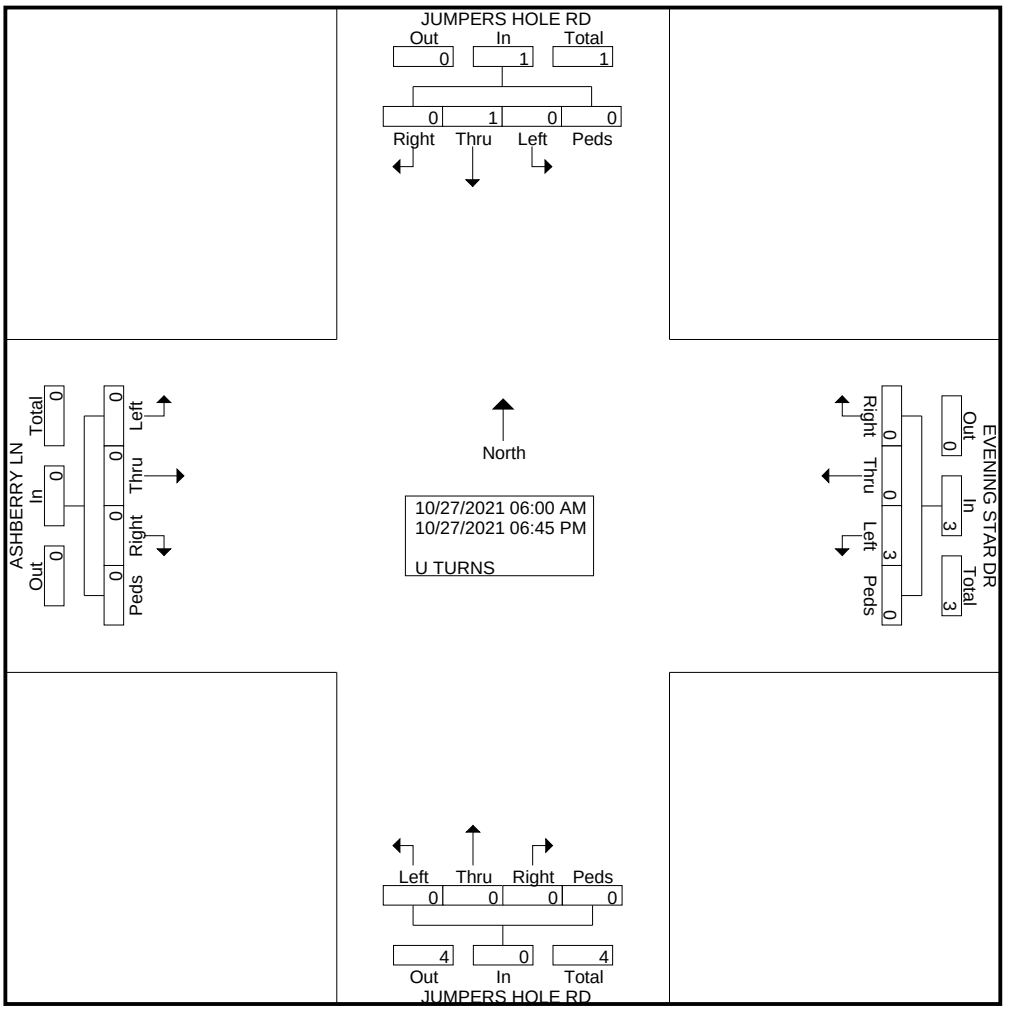
7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather:CLEAR
Counted By: DON
Town:
Country: ANNE ARUNDEL

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

Groups Printed- U TURNS

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
*** BREAK ***																					
08:45 AM	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
*** BREAK ***																					
10:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Grand Total	0	1	0	0	1	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
Apprch %	0	100	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	25	0	0	25	75	0	0	0	75	0	0	0	0	0	0	0	0	0	0	



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Columbia, Maryland 21045
443-741-3500

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7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather:CLEAR
Counted By: DON
Town:
Country: ANNE ARUNDEL

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	1	49	0	0	50	4	0	10	0	14	1	24	0	0	25	2	0	5	0	7	96
06:15 AM	5	77	1	0	83	8	0	5	0	13	0	36	2	0	38	6	0	6	1	13	147
06:30 AM	2	98	0	0	100	7	0	6	0	13	1	36	0	0	37	4	0	8	0	12	162
06:45 AM	3	101	1	0	105	10	0	12	0	22	0	52	1	0	53	9	0	12	0	21	201
Total	11	325	2	0	338	29	0	33	0	62	2	148	3	0	153	21	0	31	1	53	606
07:00 AM	2	133	3	0	138	5	0	14	1	20	1	81	2	0	84	3	0	16	0	19	261
07:15 AM	4	132	1	0	137	12	0	17	0	29	0	67	1	0	68	3	0	17	0	20	254
07:30 AM	6	131	1	1	139	9	0	9	1	19	0	88	5	0	93	4	0	11	0	15	266
07:45 AM	11	170	1	0	182	8	0	15	0	23	2	85	8	0	95	6	0	7	0	13	313
Total	23	566	6	1	596	34	0	55	2	91	3	321	16	0	340	16	0	51	0	67	1094
08:00 AM	5	114	0	0	119	10	1	18	0	29	1	80	2	0	83	4	1	9	0	14	245
08:15 AM	9	128	4	0	141	5	0	15	0	20	0	97	3	0	100	6	0	11	0	17	278
08:30 AM	9	111	0	0	120	2	0	13	0	15	0	104	2	0	106	5	0	13	0	18	259
08:45 AM	7	145	1	0	153	7	0	18	0	25	2	90	6	0	98	4	0	17	1	22	298
Total	30	498	5	0	533	24	1	64	0	89	3	371	13	0	387	19	1	50	1	71	1080
09:00 AM	14	157	3	0	174	4	0	10	0	14	1	82	6	0	89	2	0	3	0	5	282
09:15 AM	10	161	3	0	174	7	0	9	0	16	0	130	6	0	136	4	0	5	0	9	335
09:30 AM	15	163	1	0	179	4	0	7	1	12	1	133	5	0	139	2	0	7	0	9	339
09:45 AM	5	143	0	0	148	7	0	10	1	18	0	123	3	0	126	3	0	7	0	10	302
Total	44	624	7	0	675	22	0	36	2	60	2	468	20	0	490	11	0	22	0	33	1258
10:00 AM	7	133	2	0	142	1	0	7	1	9	1	116	2	0	119	2	1	5	0	8	278
10:15 AM	14	143	2	0	159	3	0	19	0	22	1	126	5	0	132	3	0	7	0	10	323
10:30 AM	6	161	0	0	167	7	0	8	0	15	0	137	5	1	143	2	0	9	0	11	336
10:45 AM	11	156	1	0	168	9	0	11	2	22	0	139	3	0	142	2	0	13	0	15	347
Total	38	593	5	0	636	20	0	45	3	68	2	518	15	1	536	9	1	34	0	44	1284
11:00 AM	8	111	3	0	122	10	0	6	0	16	0	147	10	0	157	4	0	4	0	8	303
11:15 AM	15	147	1	1	164	4	0	15	1	20	2	126	4	2	134	5	0	2	2	9	327
11:30 AM	6	136	0	1	143	9	2	13	2	26	0	154	9	1	164	4	1	4	0	9	342
11:45 AM	12	138	3	0	153	7	2	10	0	19	2	179	8	0	189	2	0	3	0	5	366
Total	41	532	7	2	582	30	4	44	3	81	4	606	31	3	644	15	1	13	2	31	1338
12:00 PM	5	160	3	0	168	1	1	9	2	13	2	149	9	0	160	2	0	9	0	11	352
12:15 PM	11	150	1	0	162	3	0	13	2	18	0	153	7	1	161	2	0	3	0	5	346
12:30 PM	10	169	2	0	181	4	0	8	2	14	2	185	14	1	202	0	0	6	0	6	403
12:45 PM	10	168	5	1	184	5	0	15	2	22	1	183	4	0	188	1	1	14	2	18	412
Total	36	647	11	1	695	13	1	45	8	67	5	670	34	2	711	5	1	32	2	40	1513
01:00 PM	7	152	1	0	160	3	0	9	1	13	1	161	6	0	168	1	0	9	0	10	351
01:15 PM	8	152	2	0	162	3	0	14	0	17	0	180	3	0	183	5	0	6	1	12	374
01:30 PM	8	165	1	0	174	4	0	14	1	19	0	169	6	0	175	1	0	7	0	8	376
01:45 PM	8	156	2	0	166	7	0	9	2	18	0	178	6	0	184	6	0	4	0	10	378
Total	31	625	6	0	662	17	0	46	4	67	1	688	21	0	710	13	0	26	1	40	1479
02:00 PM	7	125	2	0	134	2	0	17	0	19	4	163	6	0	173	3	0	10	0	13	339
02:15 PM	10	135	4	0	149	6	0	13	1	20	2	161	10	0	173	1	0	9	0	10	352
02:30 PM	11	140	2	0	153	6	1	14	0	21	0	188	9	0	197	2	0	7	1	10	381

Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 2

Groups Printed- VEHS&PEDS

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:45 PM	9	126	4	0	139	5	0	8	2	15	1	196	9	0	206	1	0	4	0	5	365
Total	37	526	12	0	575	19	1	52	3	75	7	708	34	0	749	7	0	30	1	38	1437
03:00 PM	6	130	5	0	141	4	0	10	2	16	4	178	8	0	190	3	0	6	0	9	356
03:15 PM	5	150	3	0	158	2	0	9	0	11	3	187	7	0	197	1	0	3	2	6	372
03:30 PM	7	155	2	0	164	4	0	9	0	13	3	188	11	0	202	1	0	13	2	16	395
03:45 PM	14	162	2	0	178	5	0	10	0	15	3	179	12	0	194	1	0	9	0	10	397
Total	32	597	12	0	641	15	0	38	2	55	13	732	38	0	783	6	0	31	4	41	1520
04:00 PM	13	171	0	0	184	7	0	14	0	21	2	222	7	0	231	0	0	7	1	8	444
04:15 PM	25	164	6	2	197	5	0	11	1	17	3	196	6	0	205	3	0	8	2	13	432
04:30 PM	8	146	4	0	158	2	0	14	2	18	6	205	9	2	222	1	1	9	1	12	410
04:45 PM	23	176	5	0	204	3	0	12	0	15	3	207	10	0	220	1	0	6	0	7	446
Total	69	657	15	2	743	17	0	51	3	71	14	830	32	2	878	5	1	30	4	40	1732
05:00 PM	15	186	2	0	203	7	1	12	1	21	2	216	15	0	233	4	0	8	0	12	469
05:15 PM	15	170	1	0	186	6	0	24	0	30	5	227	17	0	249	1	1	4	0	6	471
05:30 PM	16	194	7	0	217	6	1	18	0	25	4	219	12	0	235	3	0	9	1	13	490
05:45 PM	16	183	9	0	208	2	0	13	1	16	2	235	8	0	245	8	0	6	0	14	483
Total	62	733	19	0	814	21	2	67	2	92	13	897	52	0	962	16	1	27	1	45	1913
06:00 PM	17	170	7	0	194	7	0	11	1	19	8	222	12	0	242	4	0	5	0	9	464
06:15 PM	13	156	3	0	172	10	0	17	0	27	4	230	5	0	239	10	1	9	2	22	460
06:30 PM	11	137	6	0	154	4	0	10	1	15	4	208	11	0	223	2	0	11	0	13	405
06:45 PM	15	157	5	0	177	8	0	13	0	21	0	209	13	0	222	5	1	8	0	14	434
Total	56	620	21	0	697	29	0	51	2	82	16	869	41	0	926	21	2	33	2	58	1763
Grand Total	510	7543	128	6	8187	290	9	627	34	960	85	7826	350	8	8269	164	8	410	19	601	18017
Apprch %	6.2	92.1	1.6	0.1		30.2	0.9	65.3	3.5		1	94.6	4.2	0.1		27.3	1.3	68.2	3.2		
Total %	2.8	41.9	0.7	0	45.4	1.6	0	3.5	0.2	5.3	0.5	43.4	1.9	0	45.9	0.9	0	2.3	0.1	3.3	

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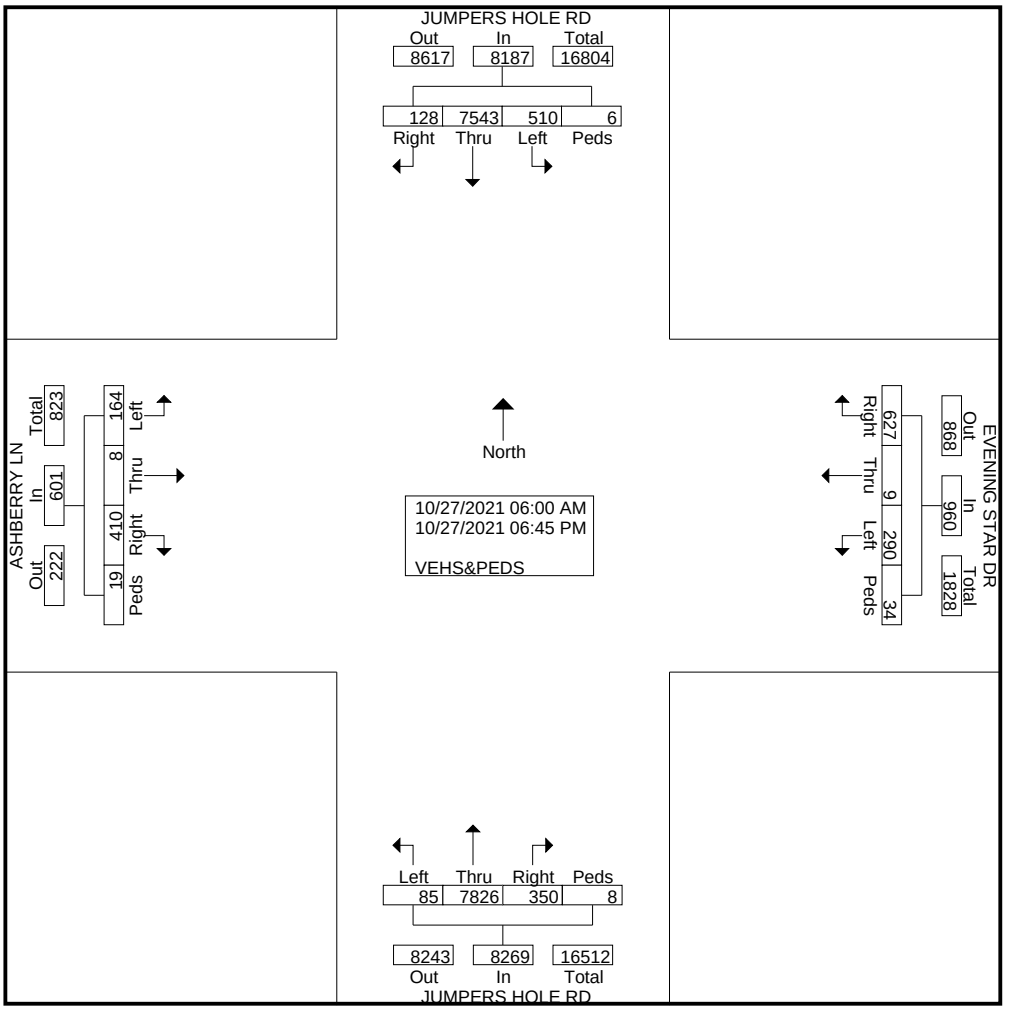
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 3



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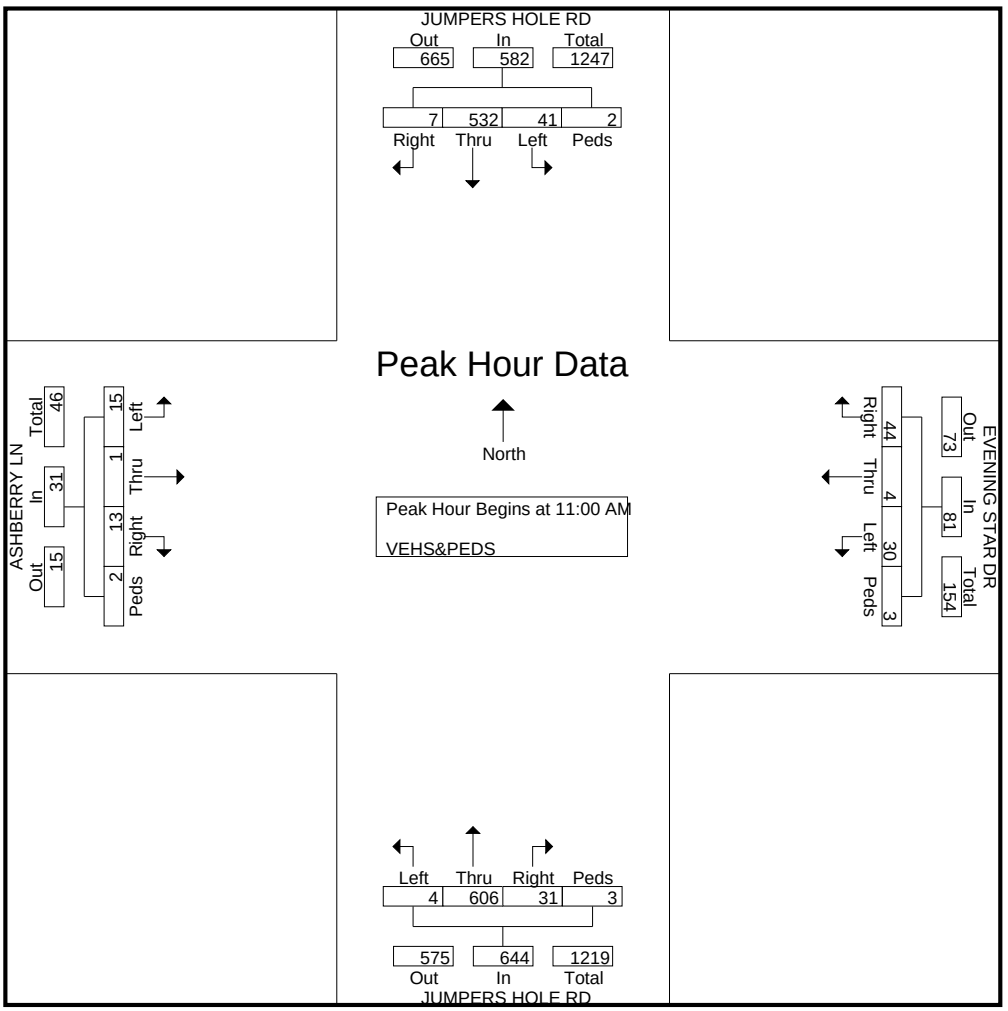
File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 4

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	8	111	**3**	0	122	**10**	0	6	0	16	0	147	**10**	0	157	4	0	**4**	0	8	303
11:15 AM	**15**	**147**	1	**1**	**164**	4	0	**15**	1	20	**2**	126	4	**2**	134	**5**	0	2	**2**	**9**	327
11:30 AM	6	136	0	1	143	9	**2**	13	**2**	**26**	0	154	9	1	164	4	**1**	4	0	9	342
11:45 AM	12	138	3	0	153	7	2	10	0	19	2	**179**	8	0	**189**	2	0	3	0	5	**366**
Total Volume	41	532	7	2	582	30	4	44	3	81	4	606	31	3	644	15	1	13	2	31	1338
% App. Total	7	91.4	1.2	0.3		37	4.9	54.3	3.7		0.6	94.1	4.8	0.5		48.4	3.2	41.9	6.5		
PHF	.683	.905	.583	.500	.887	.750	.500	.733	.375	.779	.500	.846	.775	.375	.852	.750	.250	.813	.250	.861	.914



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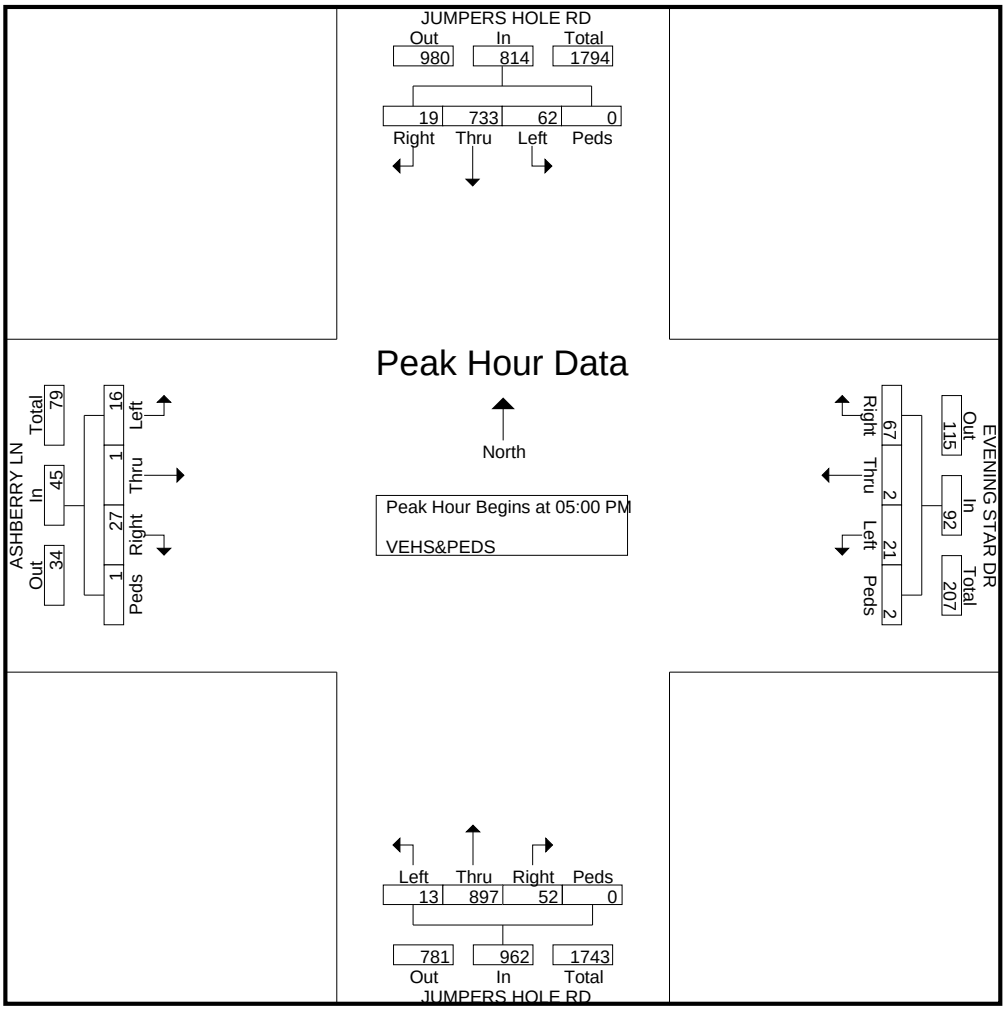
7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : JUMPERS HOLE RD AT EVENING STAR DR_DON 1
Site Code : 00000000
Start Date : 10/27/2021
Page No : 5

	JUMPERS HOLE RD From North					EVENING STAR DR From East					JUMPERS HOLE RD From South					ASHBERRY LN From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	15	186	2	0	203	**7**	**1**	12	**1**	21	2	216	15	0	233	4	0	8	0	12	469
05:15 PM	15	170	1	0	186	6	0	**24**	0	**30**	**5**	227	**17**	0	**249**	1	**1**	4	0	6	471
05:30 PM	**16**	**194**	7	0	**217**	6	1	18	0	25	4	219	12	0	235	3	0	**9**	**1**	13	**490**
05:45 PM	16	183	**9**	0	208	2	0	13	1	16	2	**235**	8	0	245	**8**	0	6	0	**14**	483
Total Volume	62	733	19	0	814	21	2	67	2	92	13	897	52	0	962	16	1	27	1	45	1913
% App. Total	7.6	90	2.3	0		22.8	2.2	72.8	2.2		1.4	93.2	5.4	0		35.6	2.2	60	2.2		
PHF	.969	.945	.528	.000	.938	.750	.500	.698	.500	.767	.650	.954	.765	.000	.966	.500	.250	.750	.250	.804	.976



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Columbia, Maryland 21045
443-741-3500

Weather: CLEAR
DON
Town:
Country: ANNE ARUNDEL

File Name : MD 2 AT WISHING ROCK RD_ DON
Site Code : 00000000
Start Date : 10/27/2021
Page No : 1

Groups Printed- VEHS&PEDS

	WISHING ROCK RD From North					MD 2 From East					From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	32	1	0	33	0	0	0	0	0	0	0	0	0	0	33
06:15 AM	0	0	0	0	0	0	39	1	0	40	0	0	0	0	0	0	0	0	0	0	40
06:30 AM	0	0	0	0	0	0	69	2	0	71	0	0	0	0	0	0	0	0	0	0	71
06:45 AM	0	0	0	0	0	0	85	8	0	93	0	0	0	0	0	0	0	0	0	0	93
Total	0	0	0	0	0	0	225	12	0	237	0	0	0	0	0	0	0	0	0	0	237
07:00 AM	0	0	2	0	2	0	102	4	0	106	0	0	0	0	0	0	0	0	0	0	108
07:15 AM	0	0	2	0	2	0	106	1	0	107	0	0	0	0	0	0	0	0	0	0	109
07:30 AM	0	0	2	0	2	0	126	1	0	127	0	0	0	0	0	0	0	0	0	0	129
07:45 AM	0	0	5	0	5	0	155	7	0	162	0	0	0	0	0	0	0	0	0	0	167
Total	0	0	11	0	11	0	489	13	0	502	0	0	0	0	0	0	0	0	0	0	513
08:00 AM	0	0	3	0	3	0	125	1	0	126	0	0	0	0	0	0	0	0	0	0	129
08:15 AM	0	0	4	0	4	0	133	3	0	136	0	0	0	0	0	0	0	0	0	0	140
08:30 AM	0	0	1	0	1	0	105	4	0	109	0	0	0	0	0	0	0	0	0	0	110
08:45 AM	0	0	4	0	4	0	158	4	0	162	0	0	0	0	0	0	0	0	0	0	166
Total	0	0	12	0	12	0	521	12	0	533	0	0	0	0	0	0	0	0	0	0	545
09:00 AM	0	0	4	0	4	0	136	2	0	138	0	0	0	0	0	0	0	0	0	0	142
09:15 AM	0	0	2	0	2	0	155	2	0	157	0	0	0	0	0	0	0	0	0	0	159
09:30 AM	0	0	0	0	0	0	173	5	0	178	0	0	0	0	0	0	0	0	0	0	178
09:45 AM	0	0	0	0	0	0	203	4	0	207	0	0	0	0	0	0	0	0	0	0	207
Total	0	0	6	0	6	0	667	13	0	680	0	0	0	0	0	0	0	0	0	0	686
10:00 AM	0	0	4	0	4	0	170	2	0	172	0	0	0	0	0	0	0	0	0	0	176
10:15 AM	0	0	4	0	4	0	192	4	0	196	0	0	0	0	0	0	0	0	0	0	200
10:30 AM	0	0	5	0	5	0	156	3	0	159	0	0	0	0	0	0	0	0	0	0	164
10:45 AM	0	0	2	1	3	0	186	0	0	186	0	0	0	0	0	0	0	0	1	1	190
Total	0	0	15	1	16	0	704	9	0	713	0	0	0	0	0	0	0	0	1	1	730
11:00 AM	0	0	2	0	2	0	200	1	0	201	0	0	0	0	0	0	0	0	0	0	203
11:15 AM	0	0	2	0	2	0	211	1	0	212	0	0	0	0	0	0	0	0	0	0	214
11:30 AM	0	0	0	0	0	0	193	3	0	196	0	0	0	0	0	0	0	0	0	0	196
11:45 AM	0	0	3	0	3	0	236	4	0	240	0	0	0	0	0	0	0	0	0	0	243
Total	0	0	7	0	7	0	840	9	0	849	0	0	0	0	0	0	0	0	0	0	856
12:00 PM	0	0	9	0	9	0	189	8	0	197	0	0	0	0	0	0	0	0	0	0	206
12:15 PM	0	0	5	0	5	0	238	5	0	243	0	0	0	0	0	0	0	0	0	0	248
12:30 PM	0	0	4	0	4	0	225	9	0	234	0	0	0	0	0	0	0	0	0	0	238
12:45 PM	0	0	5	0	5	0	196	0	0	196	0	0	0	0	0	0	0	0	0	0	201
Total	0	0	23	0	23	0	848	22	0	870	0	0	0	0	0	0	0	0	0	0	893
01:00 PM	0	0	0	0	0	0	253	2	0	255	0	0	0	0	0	0	0	0	0	0	255
01:15 PM	0	0	3	0	3	0	196	3	0	199	0	0	0	0	0	0	0	0	0	0	202
01:30 PM	0	0	2	0	2	0	232	7	0	239	0	0	0	0	0	0	0	0	0	0	241
01:45 PM	0	0	5	0	5	0	199	2	0	201	0	0	0	0	0	0	0	0	0	0	206
Total	0	0	10	0	10	0	880	14	0	894	0	0	0	0	0	0	0	0	0	0	904
02:00 PM	0	0	4	0	4	0	180	1	0	181	0	0	0	0	0	0	0	0	0	0	185
02:15 PM	0	0	3	0	3	0	214	3	0	217	0	0	0	0	0	0	0	0	0	0	220
02:30 PM	0	0	3	0	3	0	194	3	0	197	0	0	0	0	0	0	0	0	0	0	200

Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 2 AT WISHING ROCK RD_ DON
Site Code : 00000000
Start Date : 10/27/2021
Page No : 2

Groups Printed- VEHS&PEDS

	WISHING ROCK RD From North					MD 2 From East					From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:45 PM	0	0	2	0	2	0	194	4	0	198	0	0	0	0	0	0	0	0	0	0	200
Total	0	0	12	0	12	0	782	11	0	793	0	0	0	0	0	0	0	0	0	0	805
03:00 PM	0	0	2	0	2	0	193	1	0	194	0	0	0	0	0	0	0	0	0	0	196
03:15 PM	0	0	7	0	7	0	195	3	0	198	0	0	0	0	0	0	0	0	0	0	205
03:30 PM	0	0	4	1	5	0	228	1	0	229	0	0	0	0	0	0	0	0	2	2	236
03:45 PM	0	0	7	0	7	0	241	5	0	246	0	0	0	0	0	0	0	0	0	0	253
Total	0	0	20	1	21	0	857	10	0	867	0	0	0	0	0	0	0	0	2	2	890
04:00 PM	0	0	3	0	3	0	203	1	0	204	0	0	0	0	0	0	0	0	0	0	207
04:15 PM	0	0	4	0	4	0	235	4	0	239	0	0	0	0	0	0	0	0	0	0	243
04:30 PM	0	0	6	0	6	0	235	4	0	239	0	0	0	0	0	0	0	0	0	0	245
04:45 PM	0	0	3	0	3	0	253	2	0	255	0	0	0	0	0	0	0	0	0	0	258
Total	0	0	16	0	16	0	926	11	0	937	0	0	0	0	0	0	0	0	0	0	953
05:00 PM	0	0	1	0	1	0	239	2	0	241	0	0	0	0	0	0	0	0	0	0	242
05:15 PM	0	0	6	0	6	0	256	1	0	257	0	0	0	0	0	0	0	0	0	0	263
05:30 PM	0	0	0	0	0	0	243	1	0	244	0	0	0	0	0	0	0	0	0	0	244
05:45 PM	0	0	0	0	0	0	207	2	0	209	0	0	0	0	0	0	0	0	0	0	209
Total	0	0	7	0	7	0	945	6	0	951	0	0	0	0	0	0	0	0	0	0	958
06:00 PM	0	0	4	0	4	0	234	0	0	234	0	0	0	0	0	0	0	0	0	0	238
06:15 PM	0	0	3	0	3	0	237	0	0	237	0	0	0	0	0	0	0	0	0	0	240
06:30 PM	0	0	4	0	4	0	232	2	0	234	0	0	0	0	0	0	0	0	0	0	238
06:45 PM	0	0	1	0	1	0	200	1	0	201	0	0	0	0	0	0	0	0	0	0	202
Total	0	0	12	0	12	0	903	3	0	906	0	0	0	0	0	0	0	0	0	0	918
Grand Total	0	0	151	2	153	0	9587	145	0	9732	0	0	0	0	0	0	0	0	3	3	9888
Apprch %	0	0	98.7	1.3		0	98.5	1.5	0		0	0	0	0		0	0	0	100		
Total %	0	0	1.5	0	1.5	0	97	1.5	0	98.4	0	0	0	0	0	0	0	0	0	0	

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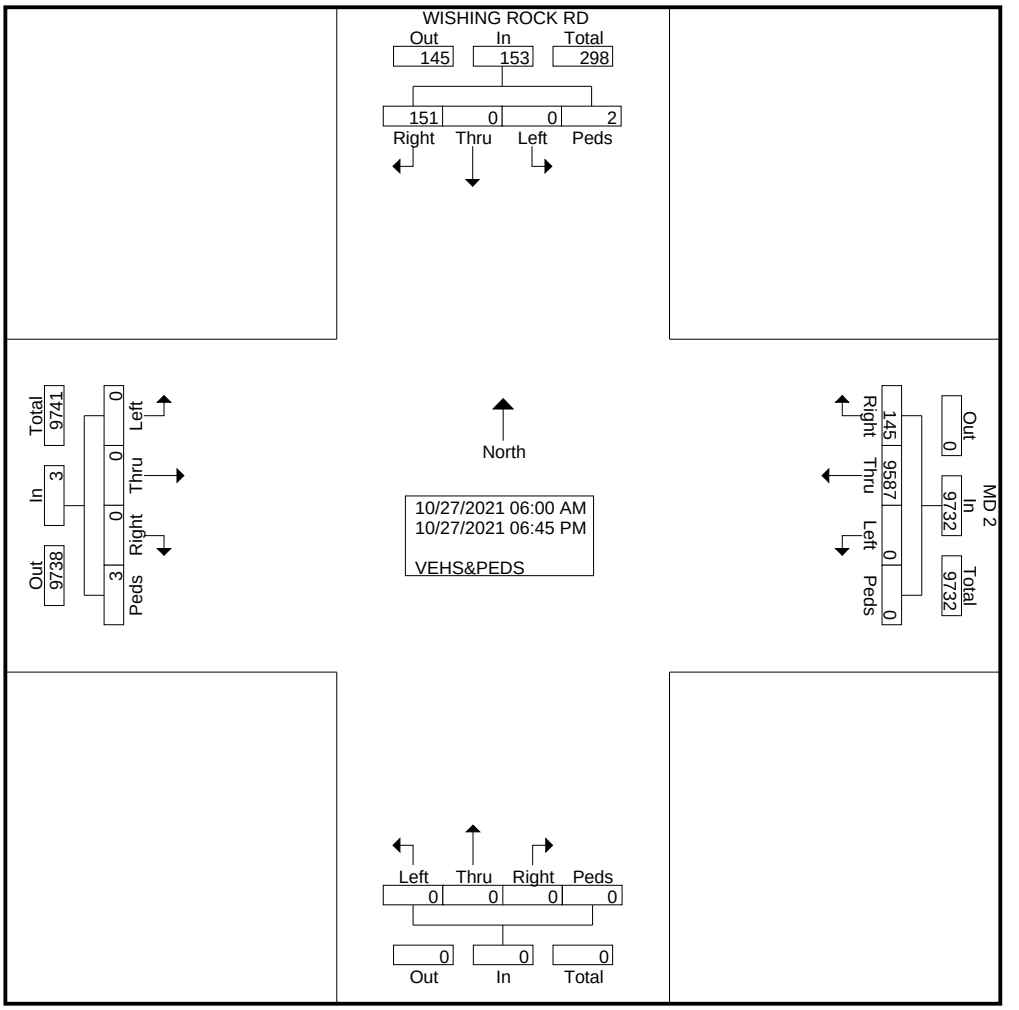
443-741-3500

File Name : MD 2 AT WISHING ROCK RD_ DON
Site Code : 00000000
Start Date : 10/27/2021
Page No : 3



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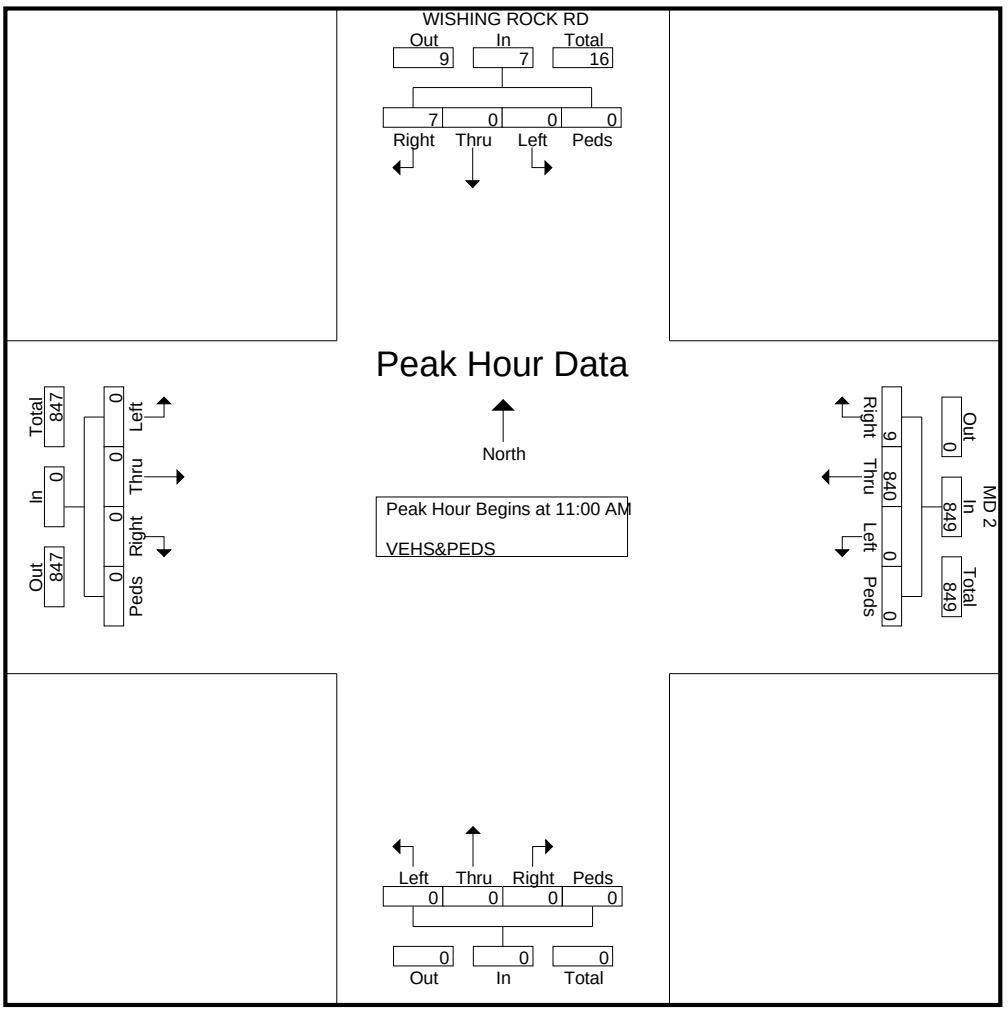
7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 2 AT WISHING ROCK RD_ DON
Site Code : 00000000
Start Date : 10/27/2021
Page No : 4

	WISHING ROCK RD From North					MD 2 From East					From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	2	0	2	0	200	1	0	201	0	0	0	0	0	0	0	0	0	0	203
11:15 AM	0	0	2	0	2	0	211	1	0	212	0	0	0	0	0	0	0	0	0	0	214
11:30 AM	0	0	0	0	0	0	193	3	0	196	0	0	0	0	0	0	0	0	0	0	196
11:45 AM	0	0	**3**	0	**3**	0	**236**	**4**	0	**240**	0	0	0	0	0	0	0	0	0	0	**243**
Total Volume	0	0	7	0	7	0	840	9	0	849	0	0	0	0	0	0	0	0	0	0	856
% App. Total	0	0	100	0		0	98.9	1.1	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.583	.000	.583	.000	.890	.563	.000	.884	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.881



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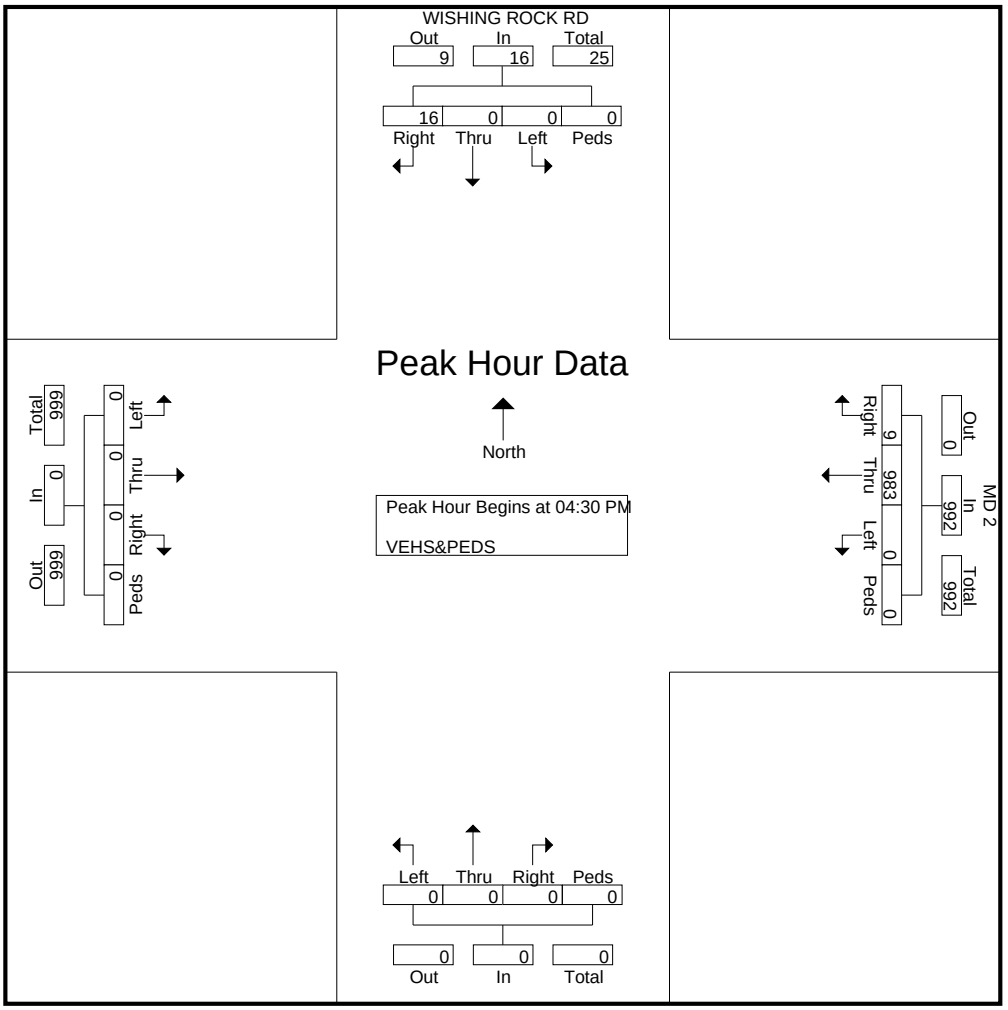
7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 2 AT WISHING ROCK RD_ DON
Site Code : 00000000
Start Date : 10/27/2021
Page No : 5

	WISHING ROCK RD From North					MD 2 From East					From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	**6**	0	**6**	0	235	**4**	0	239	0	0	0	0	0	0	0	0	0	0	245
04:45 PM	0	0	3	0	3	0	253	2	0	255	0	0	0	0	0	0	0	0	0	0	258
05:00 PM	0	0	1	0	1	0	239	2	0	241	0	0	0	0	0	0	0	0	0	0	242
05:15 PM	0	0	6	0	6	0	**256**	1	0	**257**	0	0	0	0	0	0	0	0	0	0	**263**
Total Volume	0	0	16	0	16	0	983	9	0	992	0	0	0	0	0	0	0	0	0	0	1008
% App. Total	0	0	100	0		0	99.1	0.9	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.667	.000	.667	.000	.960	.563	.000	.965	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.958



Sabra & Associates

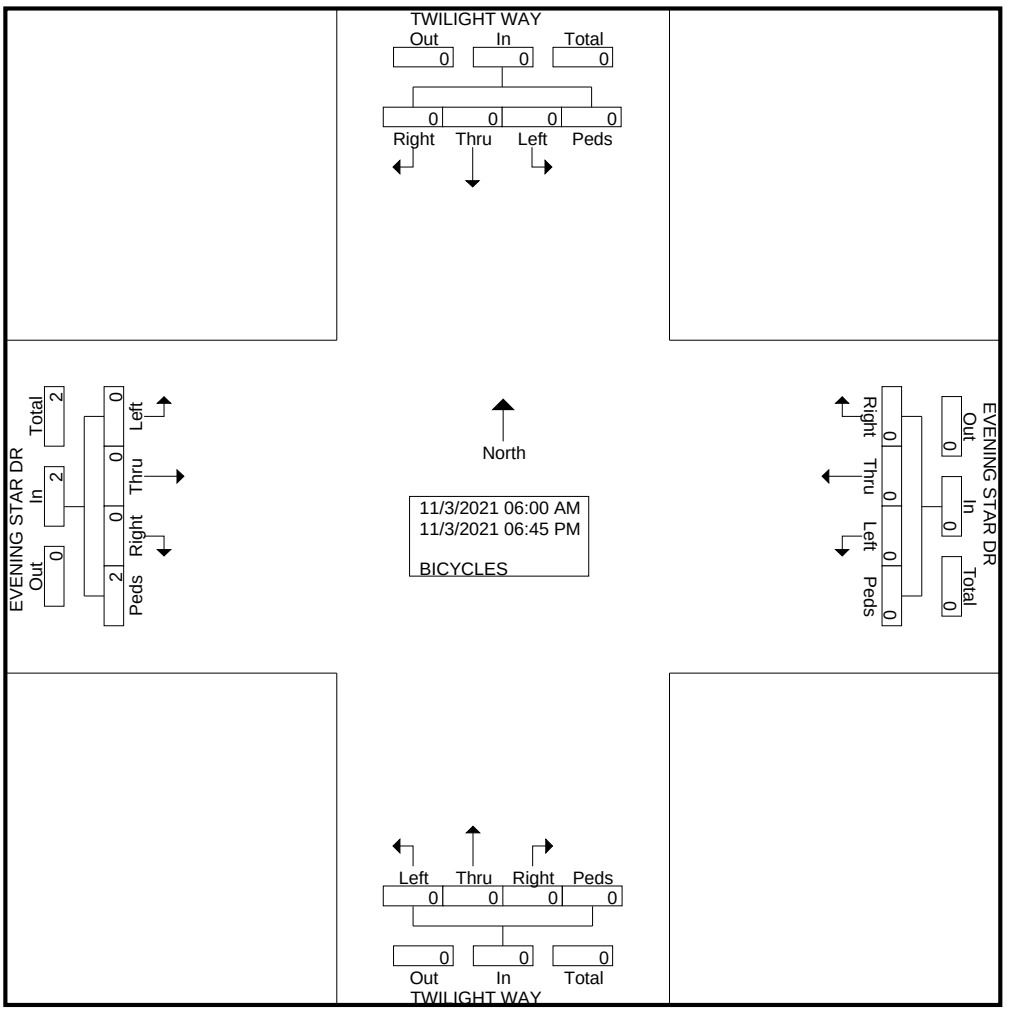
7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather: SUNNY
Counted By: GARY
Town:
Country: ANNE ARUNDEL

File Name : TWILIGHT WAY AT EVENING STAR DR
Site Code : 00000000
Start Date : 11/3/2021
Page No : 1

Groups Printed- BICYCLES

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
*** BREAK ***																					
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	



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443-741-3500

Weather: SUNNY
Counted By: GARY
Town:
Country: ANNE ARUNDEL

File Name : TWILIGHT WAY AT EVENING STAR DR
Site Code : 00000000
Start Date : 11/3/2021
Page No : 1

Groups Printed- U TURNS

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
*** BREAK ***																					
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***																					
06:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	0	0	0	2	3
Apprch %	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
Total %	0	0	0	0	0	33.3	0	0	0	33.3	0	0	0	0	0	66.7	0	0	0	66.7	

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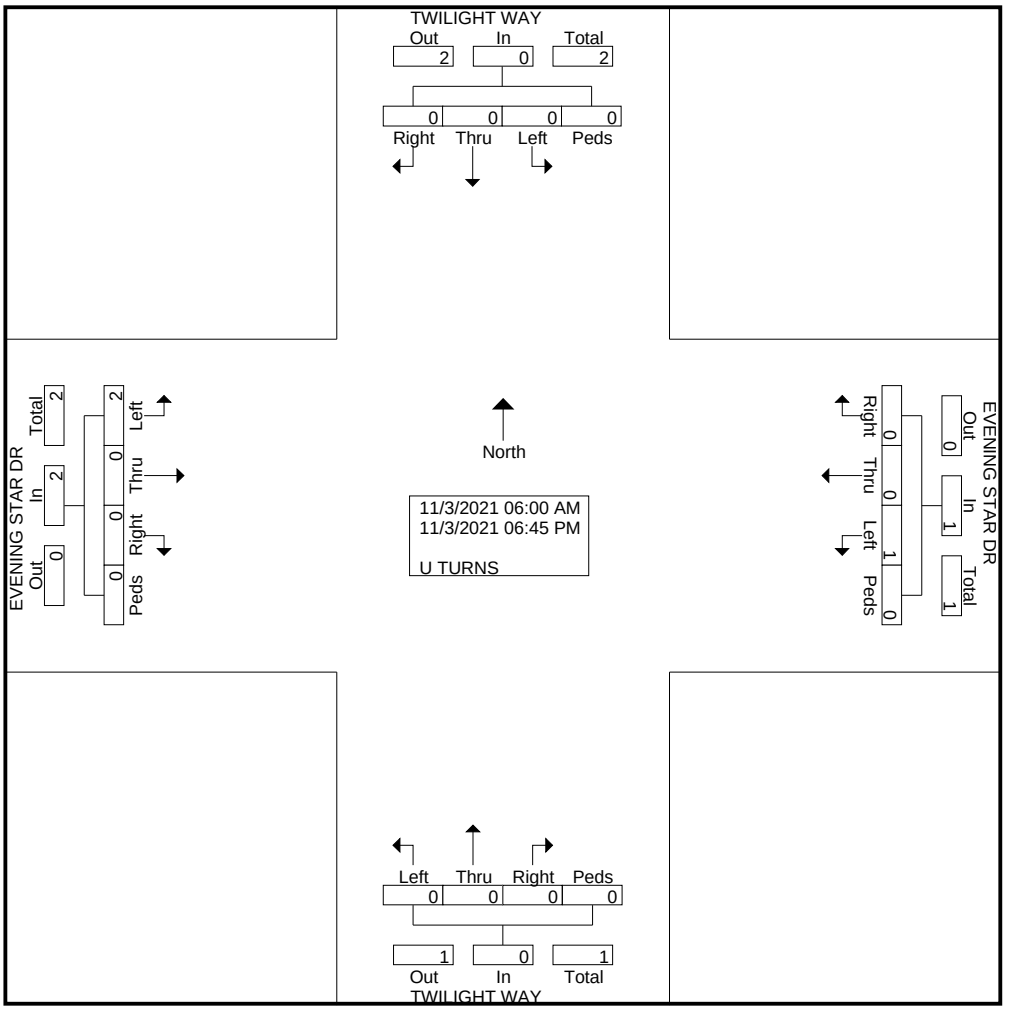

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Weather: SUNNY
Counted By: GARY
Town:
Country: ANNE ARUNDEL

File Name : TWILIGHT WAY AT EVENING STAR DR
Site Code : 00000000
Start Date : 11/3/2021
Page No : 1

Groups Printed- VEHS&PEDS

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	4	2	0	6	3	3	0	0	6	1	0	2	0	3	1	0	5	0	6	21
06:15 AM	0	4	1	0	5	6	5	0	0	11	0	0	2	0	2	0	2	3	0	5	23
06:30 AM	0	3	0	2	5	9	5	0	0	14	2	0	2	1	5	0	2	3	0	5	29
06:45 AM	0	4	1	3	8	15	12	0	0	27	0	2	2	1	5	0	6	8	0	14	54
Total	0	15	4	5	24	33	25	0	0	58	3	2	8	2	15	1	10	19	0	30	127
07:00 AM	0	6	2	1	9	21	11	1	1	34	1	0	2	1	4	2	1	6	0	9	56
07:15 AM	0	2	2	0	4	14	10	0	0	24	1	1	3	3	8	2	1	9	2	14	50
07:30 AM	0	2	1	2	5	24	8	0	0	32	2	3	1	2	8	1	4	5	1	11	56
07:45 AM	1	4	2	4	11	13	10	0	1	24	2	1	4	3	10	0	3	4	0	7	52
Total	1	14	7	7	29	72	39	1	2	114	6	5	10	9	30	5	9	24	3	41	214
08:00 AM	0	6	1	1	8	10	7	0	0	17	2	2	4	0	8	1	6	7	2	16	49
08:15 AM	1	7	1	1	10	18	11	0	0	29	4	0	4	1	9	0	3	8	1	12	60
08:30 AM	0	6	1	1	8	10	8	0	0	18	0	2	6	1	9	1	2	7	0	10	45
08:45 AM	0	4	2	2	8	8	9	1	0	18	2	0	2	1	5	0	3	8	0	11	42
Total	1	23	5	5	34	46	35	1	0	82	8	4	16	3	31	2	14	30	3	49	196
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09:30 AM	1	2	0	1	4	10	5	1	0	16	3	0	2	0	5	1	3	2	0	6	31
09:45 AM	0	1	0	2	3	2	6	1	0	9	4	2	1	0	7	1	5	8	0	14	33
Total	2	9	7	5	23	23	25	3	0	51	12	5	10	3	30	4	20	16	1	41	145
10:00 AM	1	5	1	0	7	3	5	0	0	8	3	0	2	0	5	1	3	5	0	9	29
10:15 AM	0	0	3	0	3	5	6	1	0	12	6	0	2	0	8	1	4	5	0	10	33
10:30 AM	0	3	0	1	4	3	2	0	0	5	4	0	2	0	6	0	1	5	0	6	21
10:45 AM	0	2	2	1	5	5	1	1	0	7	1	3	3	0	7	0	4	4	0	8	27
Total	1	10	6	2	19	16	14	2	0	32	14	3	9	0	26	2	12	19	0	33	110
11:00 AM	0	2	0	0	2	11	6	1	0	18	3	1	4	0	8	2	3	9	0	14	42
11:15 AM	0	2	1	0	3	8	6	1	1	16	8	0	2	2	12	2	3	6	0	11	42
11:30 AM	0	1	0	0	1	7	5	1	0	13	7	2	6	0	15	0	7	4	0	11	40
11:45 AM	2	0	1	0	3	7	4	2	0	13	4	2	2	1	9	0	8	2	0	10	35
Total	2	5	2	0	9	33	21	5	1	60	22	5	14	3	44	4	21	21	0	46	159
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12:15 PM	2	2	0	1	5	7	6	0	2	15	5	3	6	0	14	0	6	6	0	12	46
12:30 PM	0	2	3	0	5	5	5	1	0	11	10	1	7	0	18	2	2	9	1	14	48
12:45 PM	3	2	1	0	6	6	5	1	0	12	4	0	5	0	9	0	2	3	2	7	34
Total	5	8	5	1	19	21	18	3	2	44	25	6	20	1	52	2	15	23	3	43	158
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01:15 PM	0	2	3	1	6	6	6	0	0	12	5	3	6	1	15	1	7	5	1	14	47
01:30 PM	0	0	0	1	1	2	7	1	0	10	2	2	8	0	12	0	6	6	0	12	35
01:45 PM	1	2	1	1	5	3	0	4	0	7	9	0	3	1	13	2	3	8	2	15	40
Total	2	4	4	4	14	17	19	6	0	42	21	6	22	2	51	4	21	27	4	56	163
02:00 PM	0	4	0	0	4	6	6	1	0	13	5	1	7	0	13	0	4	6	0	10	40
02:15 PM	1	0	0	0	1	10	8	2	0	20	7	2	3	1	13	2	9	3	0	14	48
02:30 PM	1	2	1	1	5	4	7	0	0	11	8	7	7	2	24	1	4	8	0	13	53

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Groups Printed- VEHS&PEDS

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:45 PM	0	3	1	3	7	10	1	0	0	11	14	2	4	2	22	3	5	7	1	16	56
Total	2	9	2	4	17	30	22	3	0	55	34	12	21	5	72	6	22	24	1	53	197
03:00 PM	0	2	1	3	6	0	2	1	0	3	8	1	9	2	20	0	5	6	1	12	41
03:15 PM	0	1	0	0	1	6	6	0	0	12	10	6	6	1	23	1	5	2	0	8	44
03:30 PM	0	2	1	0	3	10	6	2	0	18	4	3	10	0	17	1	4	7	1	13	51
03:45 PM	1	2	1	3	7	8	6	0	0	14	5	4	9	1	19	0	16	10	0	26	66
Total	1	7	3	6	17	24	20	3	0	47	27	14	34	4	79	2	30	25	2	59	202
04:00 PM	1	3	1	5	10	2	2	1	0	5	10	0	17	0	27	7	11	4	0	22	64
04:15 PM	3	0	2	17	22	5	5	0	0	10	10	3	19	2	34	4	6	5	2	17	83
04:30 PM	1	1	1	0	3	5	6	1	1	13	10	9	11	2	32	2	7	12	4	25	73
04:45 PM	0	2	2	2	6	4	4	2	0	10	12	4	9	2	27	4	10	11	3	28	71
Total	5	6	6	24	41	16	17	4	1	38	42	16	56	6	120	17	34	32	9	92	291
05:00 PM	0	1	5	1	7	6	1	0	0	7	11	3	13	1	28	0	8	9	0	17	59
05:15 PM	0	2	1	3	6	5	8	0	0	13	7	7	13	0	27	1	10	12	3	26	72
05:30 PM	0	3	2	0	5	8	3	1	0	12	15	8	14	7	44	0	10	10	3	23	84
05:45 PM	0	0	1	2	3	11	4	2	0	17	12	3	15	0	30	4	10	8	2	24	74
Total	0	6	9	6	21	30	16	3	0	49	45	21	55	8	129	5	38	39	8	90	289
06:00 PM	2	3	0	1	6	9	7	2	0	18	11	4	15	0	30	2	13	6	6	27	81
06:15 PM	1	6	1	2	10	11	4	1	0	16	15	4	15	0	34	2	14	10	2	28	88
06:30 PM	0	3	0	0	3	5	4	0	0	9	18	9	9	1	37	1	9	15	1	26	75
06:45 PM	0	3	0	3	6	9	3	0	0	12	10	3	8	0	21	1	9	1	2	13	52
Total	3	15	1	6	25	34	18	3	0	55	54	20	47	1	122	6	45	32	11	94	296
Grand Total	25	131	61	75	292	395	289	37	6	727	313	119	322	47	801	60	291	331	45	727	2547
Apprch %	8.6	44.9	20.9	25.7		54.3	39.8	5.1	0.8		39.1	14.9	40.2	5.9		8.3	40	45.5	6.2		
Total %	1	5.1	2.4	2.9	11.5	15.5	11.3	1.5	0.2	28.5	12.3	4.7	12.6	1.8	31.4	2.4	11.4	13	1.8	28.5	

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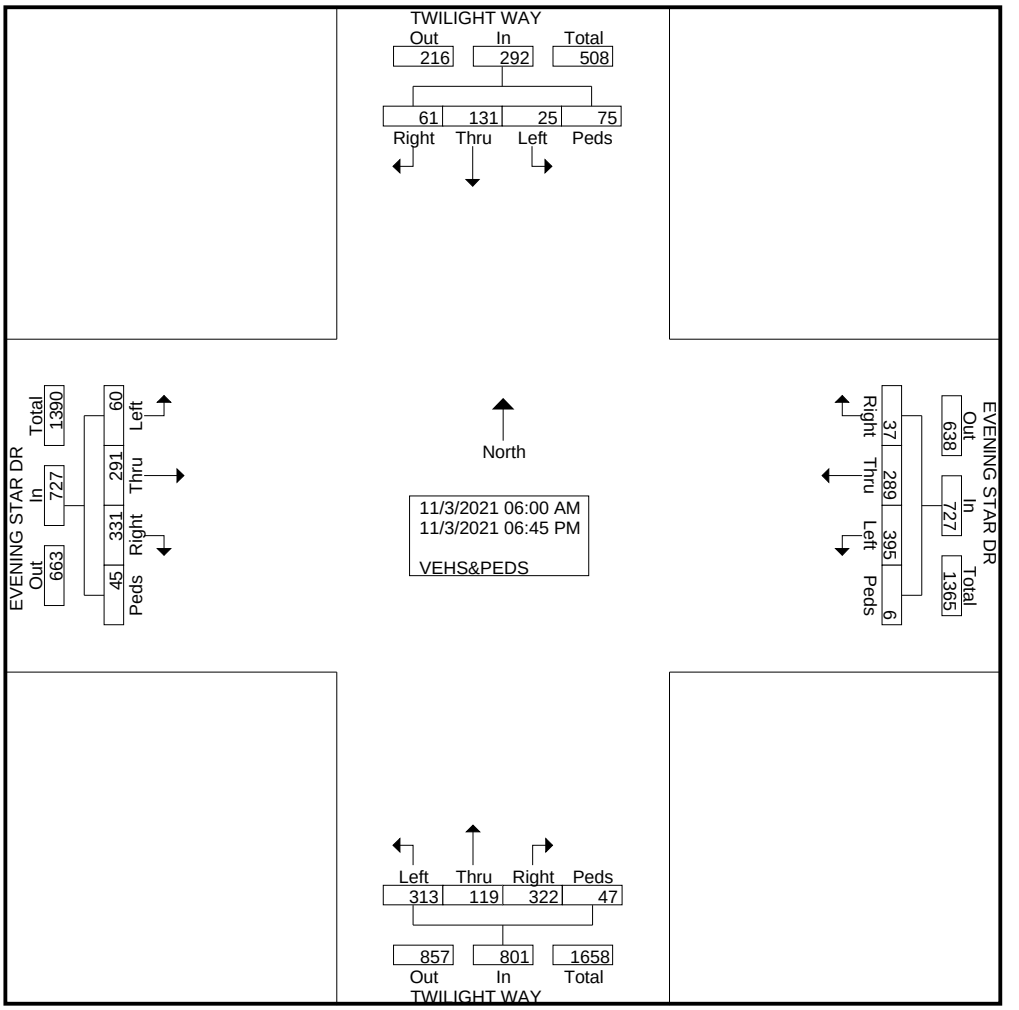
Page No : 3



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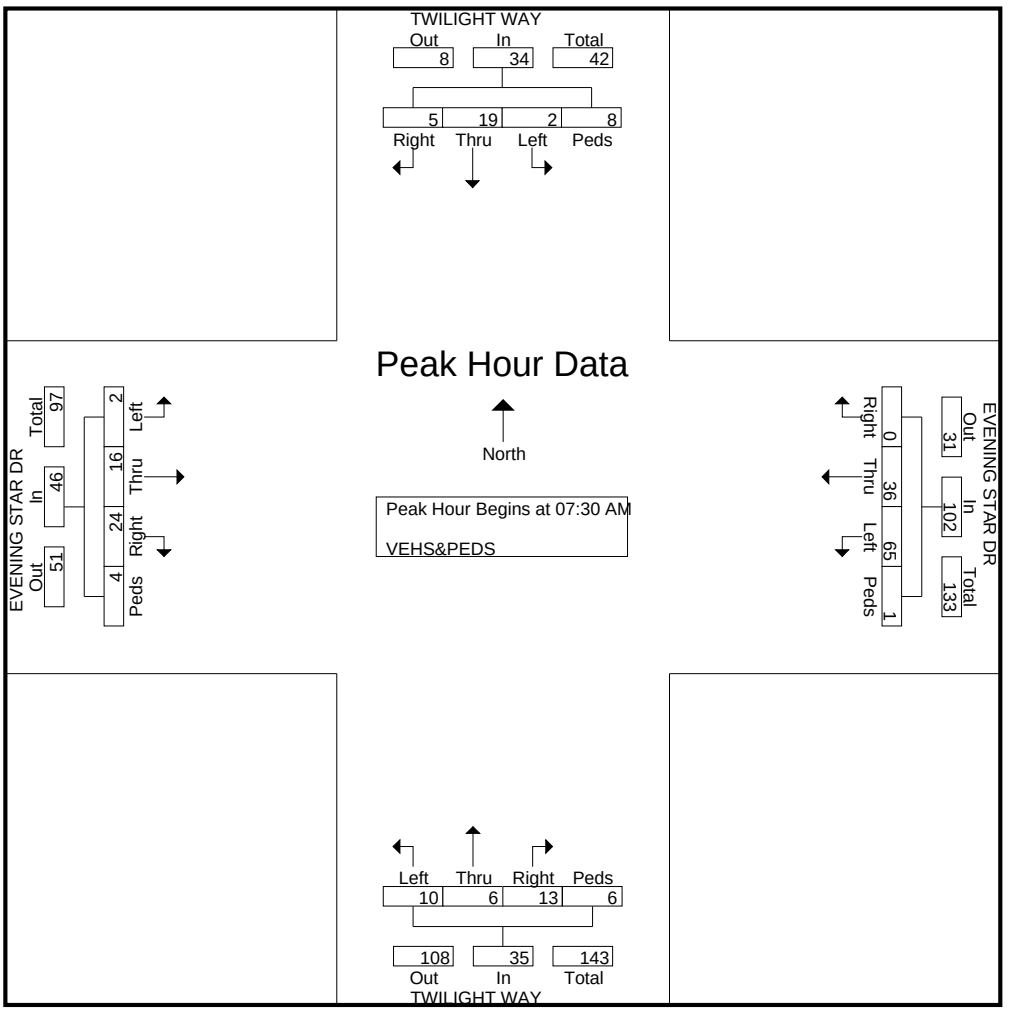
Site Code : 00000000
Start Date : 11/3/2021
Page No : 4

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	2	1	2	5	**24**	8	0	0	**32**	2	**3**	1	2	8	**1**	4	5	1	11	56
07:45 AM	**1**	4	**2**	**4**	**11**	13	10	0	**1**	24	2	1	**4**	**3**	**10**	0	3	4	0	7	52
08:00 AM	0	6	1	1	8	10	7	0	0	17	2	2	4	0	8	1	**6**	7	**2**	**16**	49
08:15 AM	1	**7**	1	1	10	18	**11**	0	0	29	**4**	0	4	1	9	0	3	**8**	1	12	**60**
Total Volume	2	19	5	8	34	65	36	0	1	102	10	6	13	6	35	2	16	24	4	46	217
% App. Total	5.9	55.9	14.7	23.5		63.7	35.3	0	1		28.6	17.1	37.1	17.1		4.3	34.8	52.2	8.7		
PHF	.500	.679	.625	.500	.773	.677	.818	.000	.250	.797	.625	.500	.813	.500	.875	.500	.667	.750	.500	.719	.904



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File Name : TWILIGHT WAY AT EVENING STAR DR
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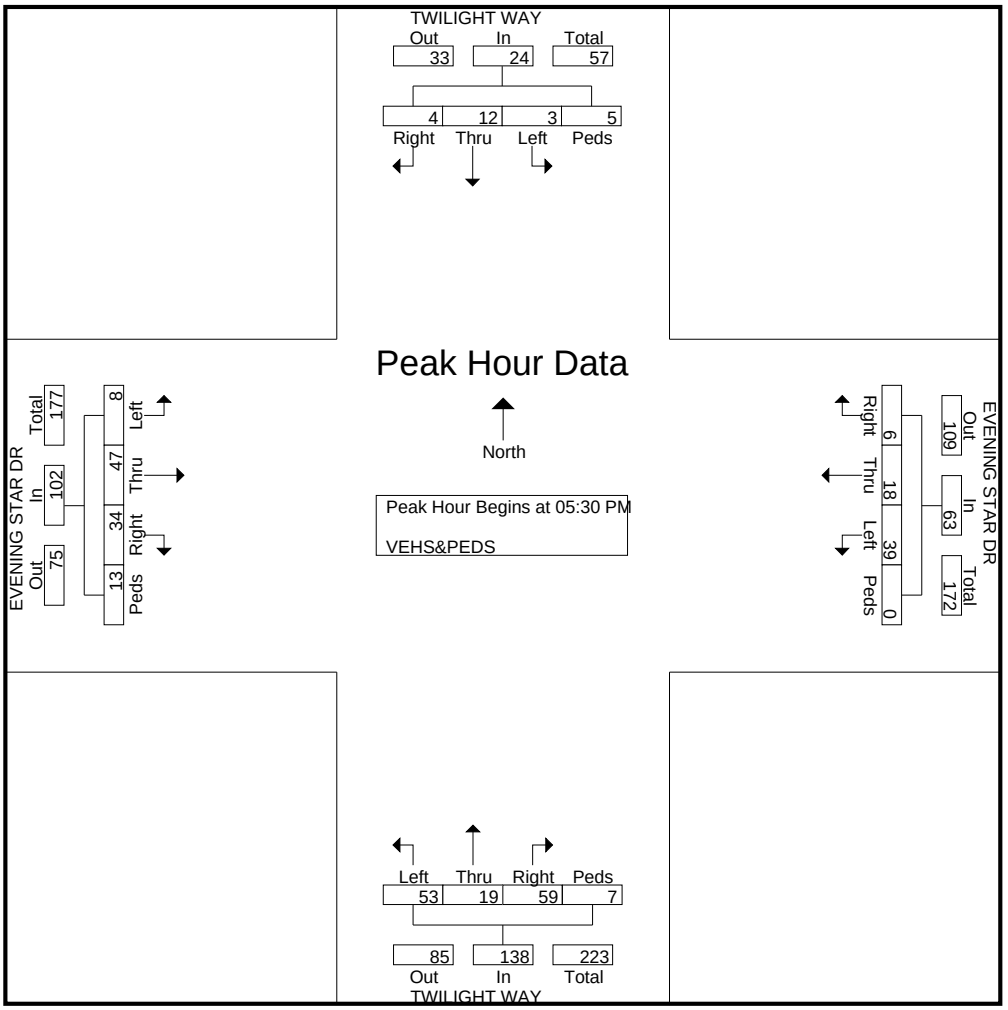
Start Date : 11/3/2021
Page No : 5

	TWILIGHT WAY From North					EVENING STAR DR From East					TWILIGHT WAY From South					EVENING STAR DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:30 PM																					
05:30 PM	0	3	**2**	0	5	8	3	1	0	12	**15**	**8**	14	**7**	**44**	0	10	**10**	3	23	84
05:45 PM	0	0	1	**2**	3	**11**	4	**2**	0	17	12	3	**15**	0	30	**4**	10	8	2	24	74
06:00 PM	**2**	3	0	1	6	9	**7**	2	0	**18**	11	4	15	0	30	2	13	6	**6**	27	81
06:15 PM	1	**6**	1	2	**10**	11	4	1	0	16	15	4	15	0	34	2	**14**	10	2	**28**	**88**
Total Volume	3	12	4	5	24	39	18	6	0	63	53	19	59	7	138	8	47	34	13	102	327
% App. Total	12.5	50	16.7	20.8		61.9	28.6	9.5	0		38.4	13.8	42.8	5.1		7.8	46.1	33.3	12.7		
PHF	.375	.500	.500	.625	.600	.886	.643	.750	.000	.875	.883	.594	.983	.250	.784	.500	.839	.850	.542	.911	.929



APPENDIX D: WARRANT ANALYSIS

PREPARED BY

Mead & Hunt

PRELIMINARY DRAFT

Traffic Warrant Analysis

For the Intersection of:

Jumpers Hole Road and Ashberry Lane / Evening Star Drive

March 2022

ANNE ARUNDEL COUNTY
MARYLAND

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1. Introduction

The Anne Arundel County Department of Public Works requested an updated traffic signal warrant analysis be conducted at the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive, as part of the ongoing transportation planning effort for the Jumpers Hole Road corridor. A prior signal warrant analysis conducted in July of 2017 found that the signal was not warranted, based on insufficient side street volume. However, additional development along Evening Star Drive in subsequent years has resulted in increased traffic volumes and the degradation of traffic operations on the stop-controlled side-street approaches at the intersection with Jumpers Hole Road. The purpose of this analysis is to reassess the latest intersection volumes and safety history to determine if signalization of the intersection is now warranted.

Recent traffic data, including turning movement counts, pedestrian counts, speed data, and crash data were collected in November 2021 and evaluated in the study. The study was performed in accordance with the most recent (2011) version of the Maryland Manual on Uniform Traffic Control Devices. An aerial satellite image of the intersection is shown below in **Figure 1**.

FIGURE 1: AERIAL SITE MAP

2. Executive Summary

The intersection of Jumpers Hole Road at Ashberry Lane/Evening Star Drive meets three (3) of the nine (9) signal warrants, satisfying the minimum requirements for a traffic signal. According to the MdMUTCD, the satisfaction of a traffic signal warrant or warrants shall not, in itself, require the installation of a traffic control signal. Additional details and recommendations for the proposed traffic operations of the traffic signal can be found in the "*Roads and Bridges Planning Study for Jumpers Hole Road – Final Report*" which **recommends the installation of the traffic signal at Jumpers Hole Road and Ashberry Lane/Evening Star Drive**.

3. Signal Warrant Analysis

A traffic signal warrant analysis was performed for the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive. The traffic signal warrant analysis is based on the warrants outlined in Section 4C of the Maryland Manual on Uniform Traffic Control Devices (MdMUTCD), 2011 Edition.

The major street, Jumpers Hole Road, has one lane on each approach for through traffic. The minor streets, Ashberry Lane has two-lanes and Evening Star Drive has one-lane[1], for the purposes of this study we will consider the minor street to have one-lane approaches in the signal warrant analyses. Intersection turning movement counts were collected for 13-hours in November of 2021, when County schools were still in session; the counts are attached at the end of this analysis.

Speed data was collected for 48-hrs using pneumatic tubes placed on Jumpers Hole Road between Woodholme Circle north and south. The results of the speed data are plotted on **Figure 2** and **Figure 3** for data collected on November 2nd and 3rd of 2021, respectively. The 85th percentile speeds along Jumpers Hole Road were found to be 39-mph in the northbound direction and between 42-mph and 43-mph in the southbound direction on both days collected.

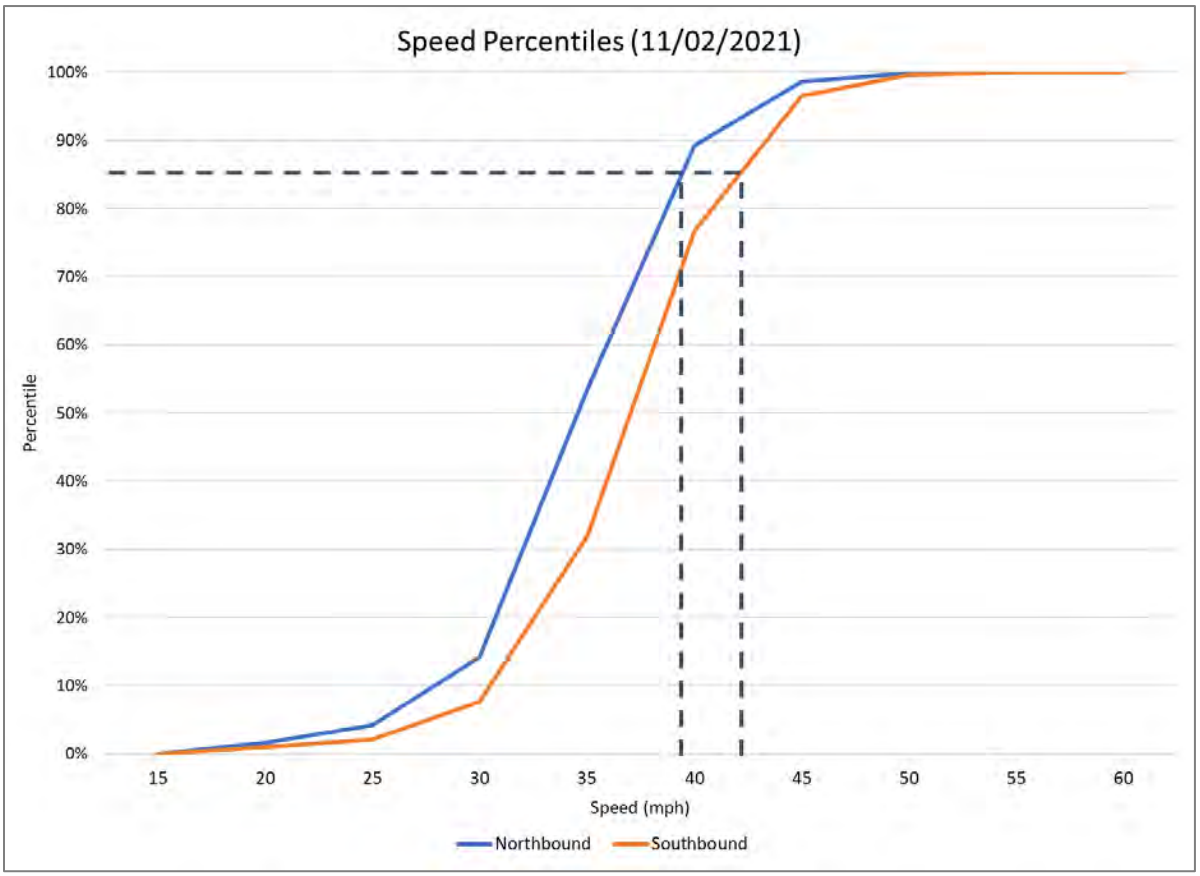


FIGURE 2: NOVEMEBER 2, 2021, SPEED DATA

[1] Although the westbound approach of Evening Star Drive is wide enough for two travel lanes, it is striped for only one lane, and parents were observed parked along the curb while waiting for school bus pick-up and drop-off restricting travel to one approach lane.

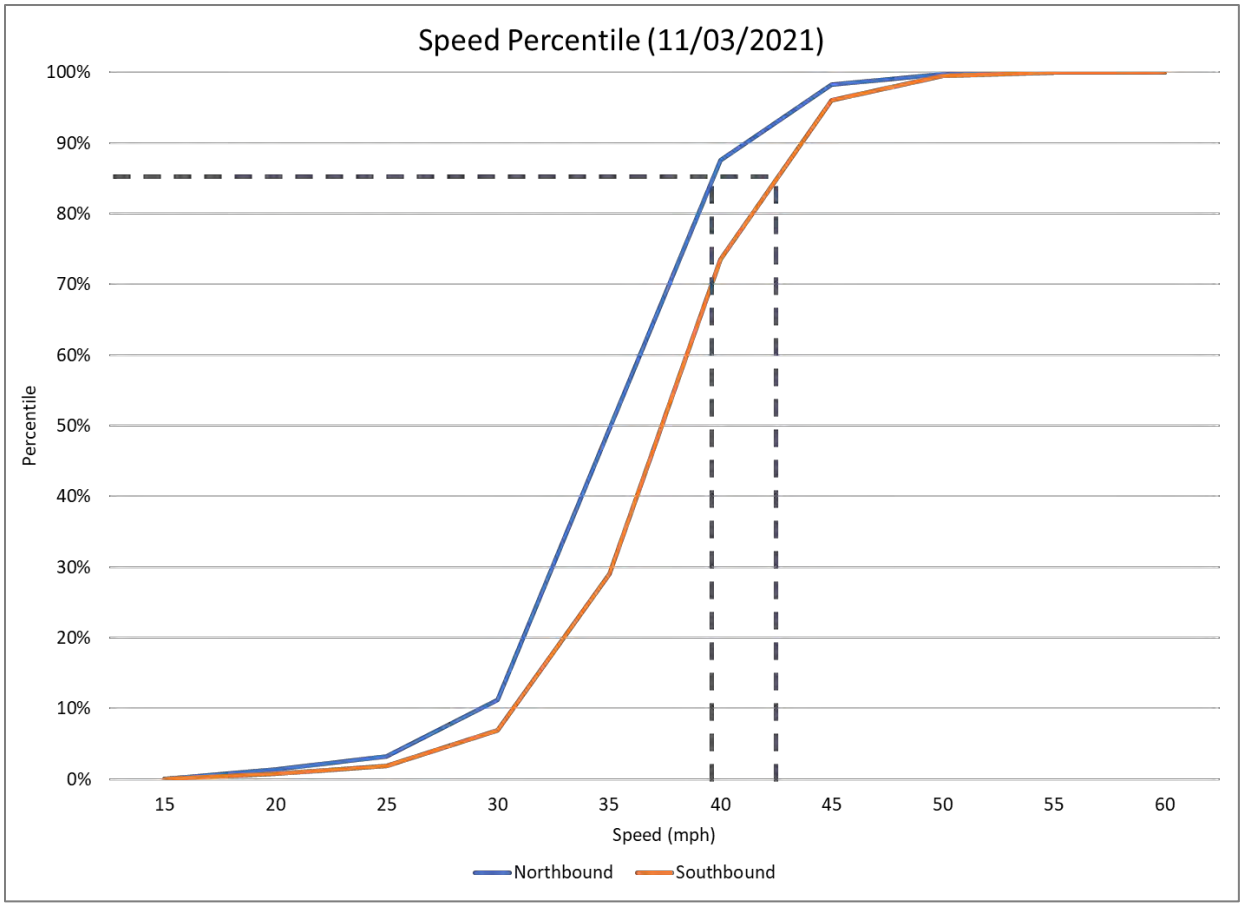


FIGURE 3: NOVEMBER 3, 2021, SPEED DATA

Based on the findings from the speed study, in accordance with the guidance presented in the MdMUTCD 2011, the warrants will consider the 70% reductions associated with mainline speeds greater than 40-mph where applicable. A brief description of each warrant is provided below.

A. Warrant #1 – Eight-Hour Vehicular Volume

Under Condition A, if the posted speed limit or the 85th percentile speed on the major street is greater than 40 mph, this warrant requires that a minimum vehicular volume of 350 vehicles per hour (vph) on the one-lane major street and 105-vph on the one-lane minor street be met for each of any eight hours of an average day. Condition B, accounting for interruption of continuous traffic, requires a minimum of 525-vph on the one-lane major street and 53-vph on the one-lane minor street for each of any eight hours of an average day.

The results of the Warrant 1 evaluation found that Condition A was met for 0 of the 8 hours required and Conditions B was met for 11 of the 8 hours required. Therefore, the eight-hour vehicular volume **warrant is MET** for the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive.

B. Warrant #2 – Four-Hour Vehicular Volume

This warrant requires that for each of any four hours of an average day, a plotted point representing the combination of the vehicles per hour on the major street and the vehicles per hour on the higher-volume minor street exceed given volumes in Figure 4C-2 of the MdMUTCD. **Figure 4** shows the sum of the major-street volumes vs. the greater of the minor street volumes plotted as circular points on the MdMUTCD

diagram. The circles represent each of the thirteen hours collected.

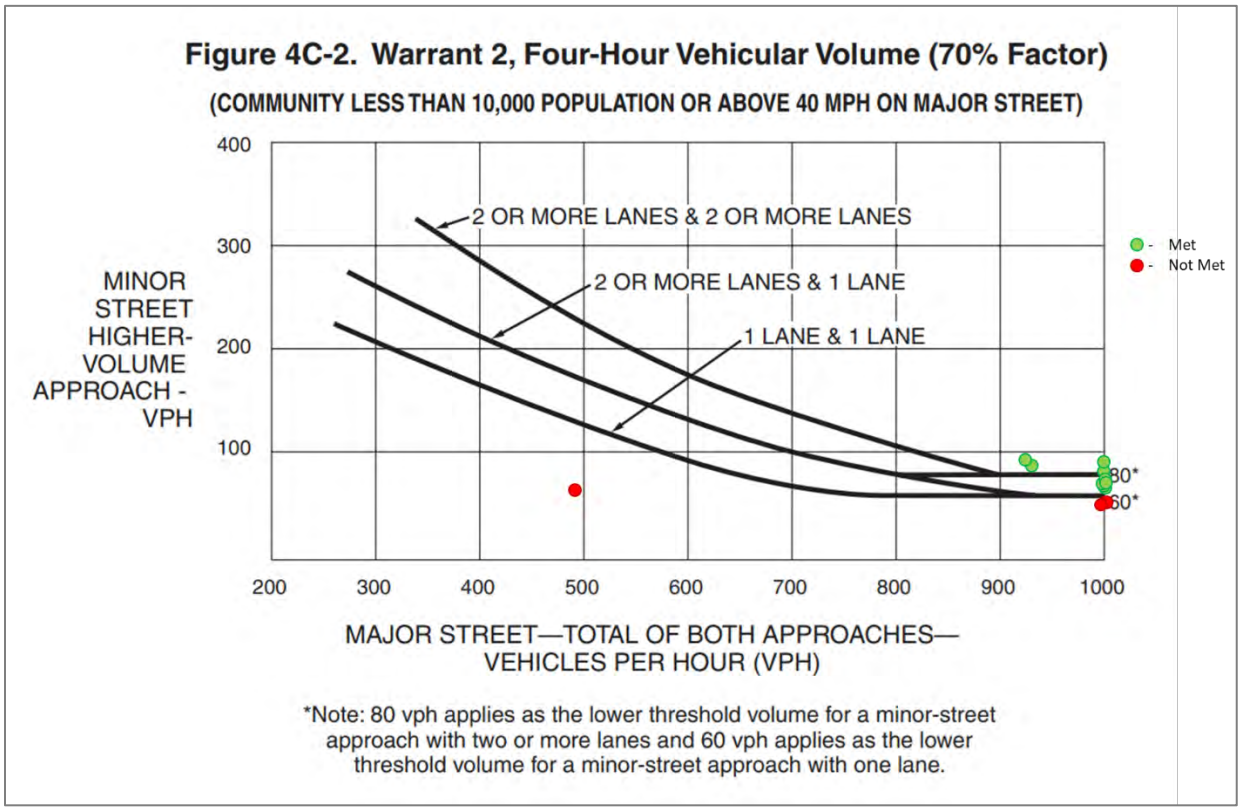


FIGURE 4: WARRANT 2, FOUR HOUR PLOT

Nine (9) of the required four (4) hours are located above the applicable curve. Therefore, the four-hour vehicular volume **warrant is MET** for the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive.

C. Warrant #3 – Peak Hour

This warrant requires that the criteria for either one of two categories (A and B) be met.

Category A requires that for any one hour (4 consecutive 15-minute periods) of an average day, all three of the following conditions must be met:

1. One minor street approach (controlled by a STOP sign) encounters a total stopped time delay of four vehicle-hours for one-lane approaches or five vehicle-hours for two-lane approaches.
2. The volume on the (same) minor street approach equals or exceeds 100 vehicles per hour for one-lane approaches or 100 vehicles per hour two-lane approaches.
3. The volume entering the intersection in one hour exceeds 650 vehicles for three-legged intersection or 800 vehicles for four-legged intersection.

Category B requires that for any one hour of an average day, a plotted point representing the vehicles per hour on both approaches of the major street and the vehicles per hour on the higher-volume minor-street approach exceeds the given volumes in Figure 4C-3 of the MdMUTCD.

Minor street volumes never exceed the 100-vph threshold to satisfy category A, but the combination of side-street and major-street volumes do satisfy the conditions of Category B of the peak hour signal warrant for

four (4) of the required one (1) hour. **Figure 5** shows the sum of the major-street volumes vs. the greater of the minor street volumes plotted as circular points on the MdMUTCD diagram. The circles represent each of the thirteen hours collected.

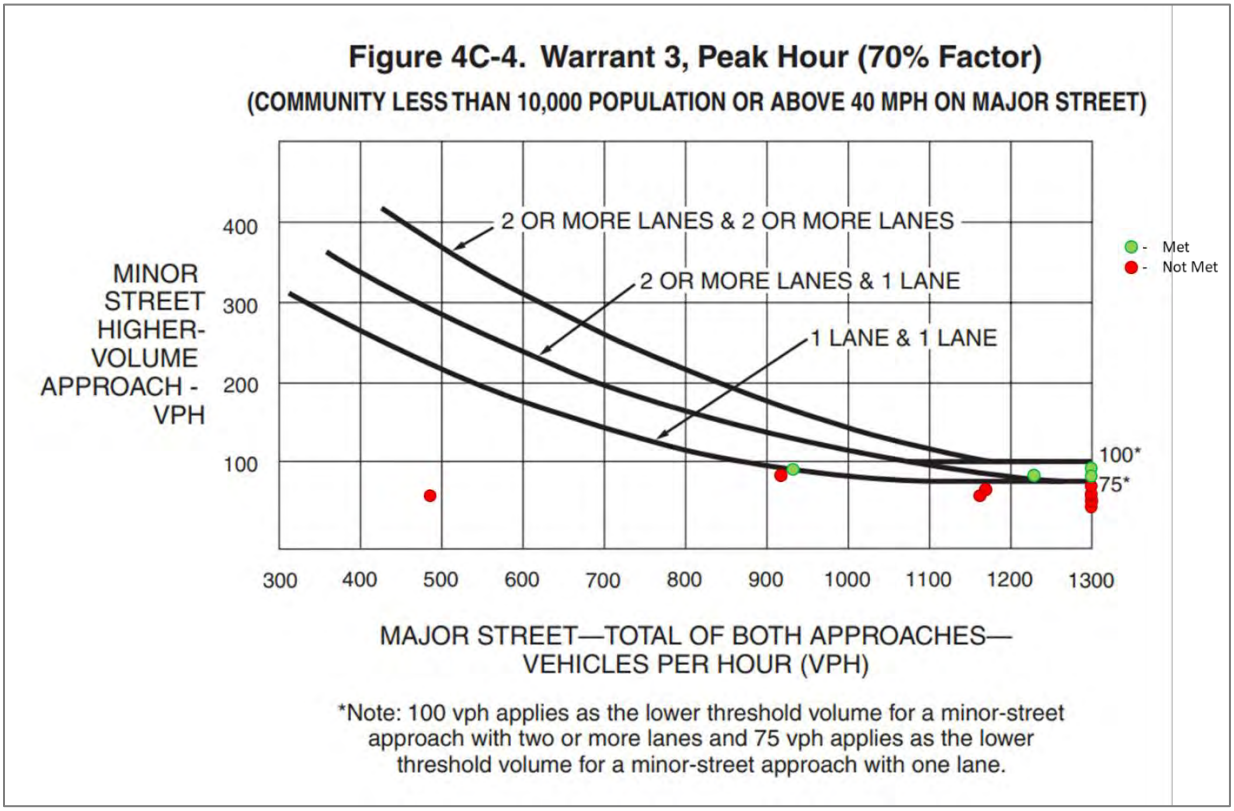


FIGURE 5: WARRANT #3 PEAK HOUR WARRANT

While the volumes are sufficient to satisfy Category B of Warrant 3, in accordance with the MdMUTCD, the peak hour warrant shall only be used in unusual cases such as office complexes, manufacturing, industrial complexes, or high-occupancy vehicle facilities, none of which describe the land uses along Ashberry Lane or Evening Str Drive. Therefore, the peak hour warrant is **NOT APPLICABLE**.

D. Warrant #4 – Pedestrian Volume

This warrant requires one of the following criteria to be met:

- Condition A: For any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street and the corresponding pedestrians per hour crossing the major street fall above the curve in Figure 4C-6.
- Condition B: For any 1 hour of an average day, the plotted point representing the vehicles per hour on the major street and the corresponding pedestrians per hour crossing the major street falls above the curve in Figure 4C-8.

In order for the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive, to satisfy this warrant, the vehicles per hour on Jumpers Hole Road and the corresponding pedestrians per hour crossing the street need to be above the curves in **Figure 6**.

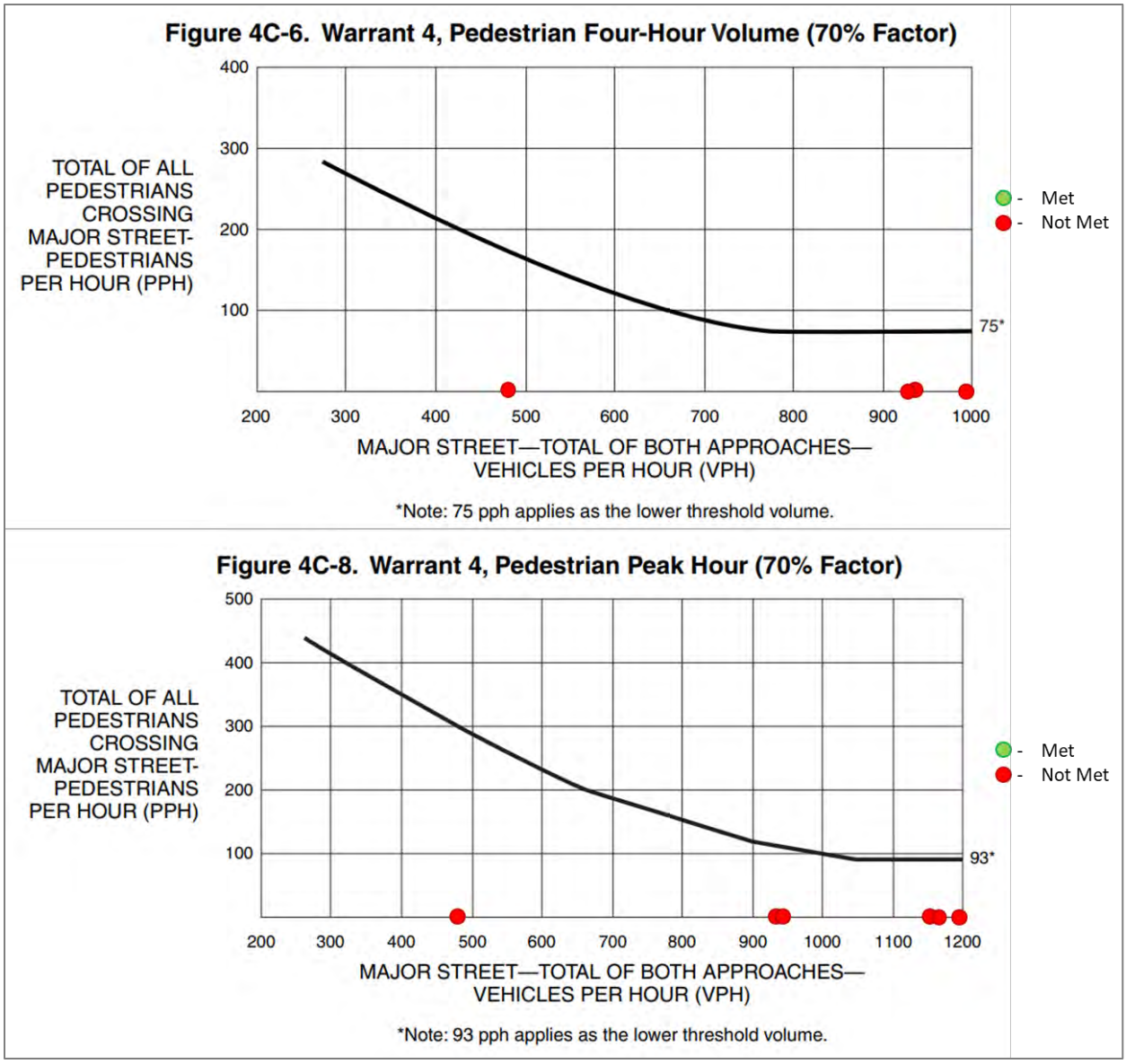


FIGURE 6: WARRANT #4 CONDITIONS A & B - PEDESTRIAN VOLUME WARRANT

The highest volume of pedestrians crossing Jumpers Hole Road was 5 people. Since the pedestrian volumes observed at the subject intersection are lower than the minimum pedestrian volumes of 75 and 93 needed to satisfy conditions A & B, respectively, the pedestrian volume **warrant is NOT MET**.

E. Warrant #5 – School Crossing

This warrant is for application in school areas. There must be a minimum of 20 schoolchildren, defined as elementary school age through high school age, crossing the major street at an established school crossing during the highest hour.

As there are no established school crossings at the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive, the school crossing signal warrant is NOT MET.

F. Warrant #6 – Coordinated Signal System

This warrant may be applicable if an engineering needs study finds that adjacent traffic control signals do

not provide the necessary vehicular platooning and adjacent traffic control signals will collectively provide a progressive operation. It should not be applied where the resultant spacing of traffic control signals would be less than 1,000 feet.

Although the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive is not currently located within a coordinated signal system, the signal is proposed to be coordinated with the existing signal at Jumpers Hole Road and the Walmart Driveway organize traffic into platoons to increase the number of available gaps for the unsignalized intersections at Woodholme Circle north and south. The proposed signal would result in signal spacing greater than the advised 1,000-ft minimum. Therefore, the Coordinated Signal System warrant is MET.

G. Warrant #7 – Crash Experience

This warrant requires that all three of the following requirements be met:

- Condition A: Sufficient testing of alternatives has failed to reduce crash frequency.
- Condition B: Five or more reported crashes, correctable by a traffic control signal (e.g., angle, left turn), have occurred within a 12-month period, with each crash involving injury or property damage.
- Condition C: The 80% columns associated with Conditions A or B in Warrant 1 are met or 80% of the requirements in the pedestrian warrant are met.

For the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive to meet this warrant all three conditions must be satisfied. Based on the five most recent years of available crash data, 5 or more crashes of type correctable by a signal have not occurred within a 12-month period (one in 2016, zero in 2017, one in 2018, one in 2019, and zero in 2020), so Condition B is not met. Therefore, the crash experience **warrant is NOT MET**.

H. Warrant #8 – Roadway Network

This warrant applies to maintaining organization of traffic flow on a roadway network. The intersection must meet one or both of the following characteristics:

- Condition A: The intersection has or is projected to have, within five years, an entering volume exceeding 1,000 vehicles during the peak hour of an average weekday
- Condition B: The intersection has or is projected to have, within five years, an entering volume exceeding 1,000 vehicles during 5 hours of a non-workday

Additionally, the intersection must be at the meeting of two or more major routes and the major routes must have at least one of the following characteristics:

- It is part of the highway system that serves as the principal roadway network for through traffic flow.
- It includes rural or suburban highways outside, entering, or traversing a city.
- It appears as a major route on an official plan.

The intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive has an entering vehicle volume exceeding 1,000 during the peak hour of an average workday, but the minor streets, Ashberry Lane and Evening Star Drive, do not satisfy the additional requirements. Therefore, the roadway network **warrant is NOT MET**.

I. Warrant #9 – Intersection Near a Grade Crossing

This warrant requires that both of the following two conditions are met:

- Condition A: A grade crossing exists on a STOP or YIELD controlled approach within 140 feet of the stop or yield line.
- Condition B: During the highest traffic volume hour, the plotted point representing vehicles per hour on the major street and the corresponding vehicles per hour on the minor street approach that crosses the track falls above the applicable curve in Figure 4C-9 or 4C-10.

The intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive is not in close proximity to a grade crossing. Therefore, the intersection near a grade crossing **warrant is NOT APPLICABLE**.

4. Signal Warrant Summary

The summary of the traffic signal warrants is presented in **Table 1**. The results of the traffic signal warrant analysis indicate that three of the nine warrants are met. Hence, a traffic signal is warranted at the study intersection.

TABLE 1: SUMMARY OF SIGNAL WARRANT ANALYSIS

Warrant	Description	Warrant Met?
1	Eight Hour Vehicular Volume	YES
2	Four Hour Vehicular Volume	YES
3	Peak Hour	N/A
4	Pedestrian Volume	NO
5	School Crossing	NO
6	Coordinated Signal System	YES
7	Crash Experience	NO
8	Roadway Network	NO
9	Intersection Near a Grade Crossing	N/A

5. Conclusion

The intersection of Jumpers Hole Road at Ashberry Lane/Evening Star Drive meets three (3) of the nine (9) signal warrants satisfying the minimum requirements for a traffic signal. According to the MdMUTCD, the satisfaction of a traffic signal warrant or warrants shall not, in itself, require the installation of a traffic control signal. Engineering judgment and a traffic operations analysis are also critical data needed to signal installation. These additional details on the proposed traffic operations and recommendations for the signal can be found in the "*Roads and Bridges Planning Study for Jumpers Hole Road – Final Report*" which **recommends the installation of the traffic signal at Jumpers Hole Road and Ashberry Lane/Evening Star Drive**.

APPENDIX E: MATRIX OF PROS/CONS FOR INITIAL RECOMMENDATIONS

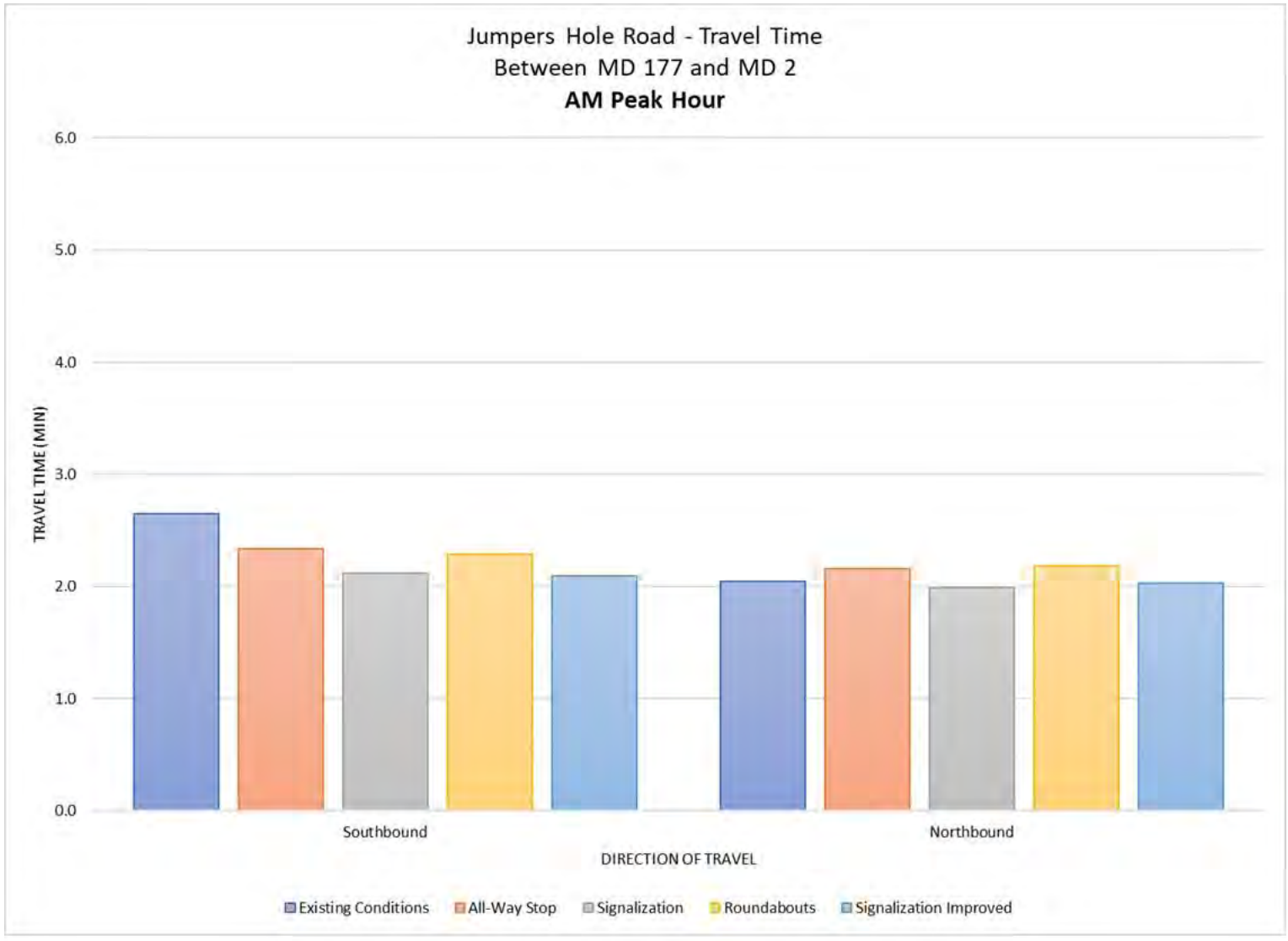
Countermeasure		Evaluation Criteria: Right of way needs	Utilities relocated	Expected Reduction in Speeding	Expected *new* gaps in JHR traffic for side street access compared to Existing Conditions.		*Change* in travel time through corridor compared to Existing	Undesirable changes in vehicle wait time	Undesired new queues or spillbacks into adjacent intersections	Connectivity to the existing pedestrian and bike infrastructure	Planning-level constructions costs	Notes
Notes on Countermeasures Evaluated		*Private/HOA ROW needs*	*Overground utilities that cannot be designed around or underground utilities that need to be relocated*	*Speed Reduction expected with main line traffic control that interrupts uncontrolled free flow movement. Also, expected if countermeasure has a know traffic calming effect.*	*The AM(PM) number represents the maximum number of cars that can potentially get out onto JHR in an hour. This is not the number of gaps in an hour, since multiple cars can egress during a given gap in traffic. This is NOT the number of gaps - which is not reported by the traffic model. This egress number can be confirmed/supported by the change in vehicle delay experience by side street vehicles. For example, if more cars can egress under a tested alternative, then the average delay experienced by side street motorists will also decrease.*		*Travel Time is from MD 2 to MD 177 (in minutes)*	*Defined as large new increases in delay and V/C ratios at any approach in the corridor*	*large increases in queuing at any approach*	*new controlled crosswalks or new sidewalk or side path*	*Capital cost of improvement in 2022 dollars*	-
Existing Conditions		N/A	N/A	N/A	**Gaps** per AM(PM) PH: -Ashberry: 270 (59) -Woodholme N: 263(50) -Woodholme S: 360 (80)	**Delay** in sec, per AM(PM) PH: Ashberry EB 22.7 (293.2) Evening Star 28.0 (279.0) Woodholme N. EB 19.4 (127.1) Woodholme N. WB 18.7 (64.7) Woodholme S. EB 14.7 (41.0) Woodholme S. EB 15.6 (81.7)	NB AM(PM) Travel Time: 2.0 min (2.8 min) SB AM(PM) Travel Time: 2.6 min (4 min)	N/A	N/A	N/A	N/A	N/A
1	All-way Stop at Evening Star / Ashberry	None	None	Yes - traffic control breaks up long uncontrolled stretch	Gaps per AM(PM) PH: -Ashberry: No longer applies -Woodholme N: 264(50) -Woodholme S: 360 (80)	Delay per AM(PM) PH: Ashberry EB 10.6 (10.9) Evening Star WB 11.2 (11.3) Woodholme N. EB 19.4 (125.8) Woodholme N. WB 18.7 (64.1) Woodholme S. EB 14.7 (40.7) Woodholme S. WB 15.6 (80.9)	*minimal in AM. But an issue in PM.* NB AM(PM) Travel Time: 2.2 min (5.3 min) SB AM(PM) Travel Time: 2.3 min (3.4 min)	V/C > 1 in PM along NB and SB JHR at Evening Star	NB PM queuing issues along JHR at Evening Star	Allows for protected pedestrian crossing at Evening Star	~$1000	Option for NB & SB Left-turn bays at Evening Star Dr. this option only creates new gaps only at Evening Star Intersection
2	Traffic Signal at Evening Star	Easement for signal pole on east side of intersection	None	Yes - traffic control breaks up long uncontrolled stretch	Gaps per AM(PM) PH: -Ashberry: No longer applies -Woodholme N: 254(130) -Woodholme S: 390 (181)	Delay per AM(PM) PH: Ashberry EB 39.0 (40.0) Evening Star WB 40.8 (40.8) Woodholme N. EB 19.8 (43.7) Woodholme N. WB 19.3 (28.2) Woodholme S. EB 14.3 (21.4) Woodholme S. WB 14.6 (32.6)	Yes - minor improvements NB AM(PM) Travel Time: 2.0 min (2.8 min) SB AM(PM) Travel Time: 2.1 min (3.5 min)	No deterioration in LOS	No material changes to queuing	Allows for protected pedestrian crossing at Evening Star. Option for providing crosswalk across JHR at Walmart Signal	$250,000	Signal creates new gaps for all neighborhood side streets. Additional Option for NB & SB Left-turn bays at Evening Star Dr.
2a	With other signal improvements along JHR	Easement for signal pole on east side of intersection	None	Yes - traffic control breaks up long uncontrolled stretch	Gaps per AM(PM) PH: -Ashberry: No longer applies -Woodholme N: 254(130) -Woodholme S: 390 (181)	Delay per AM(PM) PH: Ashberry EB 39.0 (40.0) Evening Star WB 40.8 (40.8) Woodholme N. EB 19.8 (43.7) Woodholme N. WB 19.3 (28.2) Woodholme S. EB 14.3 (21.4) Woodholme S. EB 14.6 (32.6)	Yes - minor improvements NB AM(PM) Travel Time: 2.2 min (3.0 min) SB AM(PM) Travel Time: 2.3 min (3 min)	No deterioration in LOS	No material changes to queuing	Allows for protected pedestrian crossing at Evening Star. Option for providing crosswalk across JHR at Walmart Signal	$275,000	This option adds additional roadway capacity improvements between Walmart entrances to increase JHR capacity. Improvements proposed due to inefficiencies observed in the congested southern segment of JHR. Capacity analysis and queuing analysis indicated little improvement.
3	Roundabout at Evening Star and mini roundabout at Woodholme Circle (S)	~6500 SF of HOA property, most of which is used for existing drivers/walkers	3 Power line poles 2 communication boxes 2 HOA welcome signs 1 HOA Guardhouse 2 pedestrian light posts 4 inlets 1 fire hydrant	Yes - traffic control breaks up long uncontrolled stretch	Gaps per AM(PM) PH: -Ashberry: No longer applies -Woodholme N: 264(92) -Woodholme S: No longer applies	Delay per AM(PM) PH: Ashberry EB 7.2 (7.3) Evening Star WB 5.2 (9.1) Woodholme N. EB 19.4 (0.0) Woodholme N. WB 18.7 (64.1) Woodholme S. EB 5.7 (6.1) Woodholme S. WB 3.8 (7.1)	*Negligible compared to existing.* *NB AM(PM) Travel Time:* *2.0 min (2.8 min)* *SB AM(PM) Travel Time:* *2.1 min (3.7 min)*	No deterioration in LOS	Generally, no increases in queue lengths. However, queuing is more common in between WM signal and mini roundabout - occasional spillbacks into circle.	Does not allow for protected pedestrian crossing; however, slower speeds due to roundabouts assist in providing safer crossings.	$500,000 plus design fees expected to exceed $100,000	Mini-roundabout on South Woodholme circle because we Wanted to provide as much queuing space as possible. Also allows for NB and SB LT from JHR. Also, mini-roundabout not typically found along arterials. Also, buses can't make left turns without traversing over the mini-roundabout.
4	New Roadway Connections	Perth Connection: ~3000 SF of easement for existing driveway. Evening Star Connection ~3000 SF of easement of Creekstone developer-owned property for existing driveway between Woodholme (N) and Evening Star.	Minor: 2 manhole heights to be adjusted for Perth connection. None for evening star connection; existing culvert along south side of Evening Star will need to be piped under new roadway connection	None	None	None	None	None	None	None	Perth Road Connection: ~$50,000. Evening Star Connection: ~$200,000. Ashberry Lane Connection: ~$200,000. Costs do not include design fees, which could exceed $100,000 depending on topographic survey	Connections would be made via non-public land and would need easement or property transfer.
5	Sidewalk / side path	Yes -moderate. Sidewalk/side path on the west side is feasible *without* ROW takes (15' between edge line and parcel boundary). East side of JHR has no public ROW available for sidewalk/side path; accordingly any ROW will be dependent on	at-grade sidewalk or side path can weave around utilities along the west side of JHR. Above-grade sidewalk will need curb and relocated inlets	Minor Reduction due to change in aesthetic of roadway toward a more pedestrian-oriented appearance	None	None	None	None	None	improved connectivity with sidewalk or side path.	Expected cost is about ~$400,000 to $700,000, depending selected design (e.g. grade separated, repurpose existing shoulders, etc.). Additionally, design fees are expected to exceed $100,000, depending on topographic survey.	new sidewalk and side path would have to involve new driveway aprons if left at grade (however, this is less safe the curb protected sidewalk or side path). If raised above grade, then new curb, new aprons, and inlet relocation would be needed. Similarly, multiple options exist for the segment from Evening Star to MD 177 (e.g. repurpose shoulders with at-grade vertical separation or provide grade-separated path).
6	bike lanes	None	None	Minor Reduction due to change in aesthetic of roadway toward a more bicycle-oriented appearance	None	None	n/a	n/a	n/a	Improved at-grade connectivity to B&A Trail	~$1000	Bike lanes that only use existing shoulders through Woodholme would be suboptimal, as they are only 4 feet wide. It is anticipated that such bike lanes - in conjunction with a 20,000 ADT roadway would seem limited use by cyclists. Standard-width bike lanes (minimum of 5 feet) would require construction of new full-depth pavement along the west side of the corridor where right of way is available and then a general re-striping of the roadway through the Woodholme neighborhood. This installation would increase the cost to over $100,000.
7	Truck Prohibitions	None	None	None	None		None	None	None	None	$200 estimated for signage and installation	None

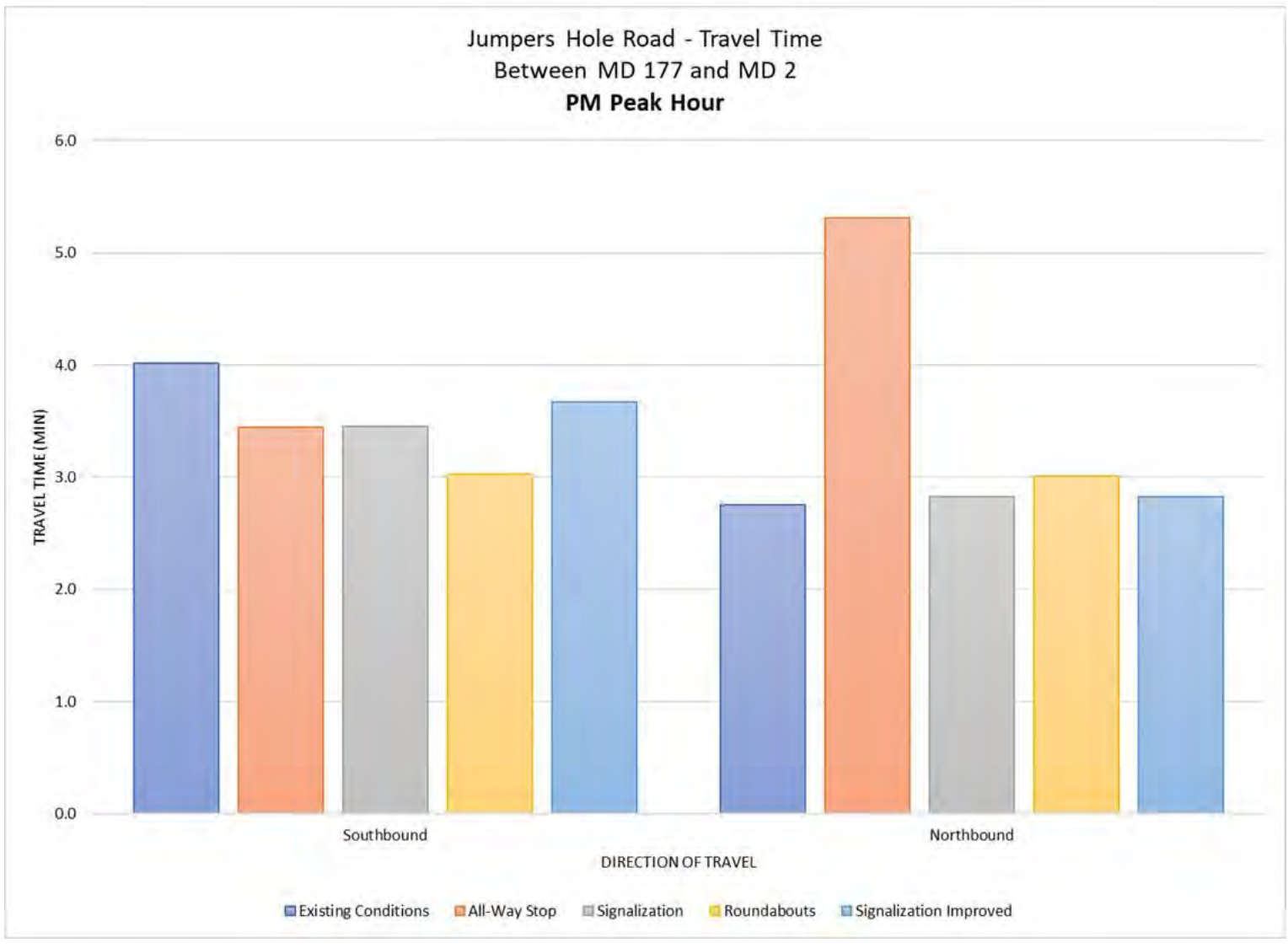
APPENDIX F: TRAFFIC CAPACITY TABLE, TRAVEL TIME COMPARISON, AND HCM REPORTS

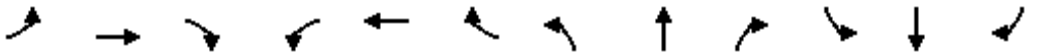
Capacity Analysis Table

ID	Intersection	Approach	Movement	Existing Conditions				All Way Stop				Signalization				Roundabouts				Signalization Improved				Storage Length (ft)
				Delay	LOS	V/C	95th Q Length (ft)	Delay	LOS	V/C	95th Q Length (ft)	Delay	LOS	V/C	95th Q Length (ft)	Delay	LOS	V/C	95th Q Length (ft)	Delay	LOS	V/C	95th Q Length (ft)	
1	Jumpers Hole Rd & MD 177 (Mountain Rd)	Control Type		Signal				Signal				Signal				Signal				Signal				-
		Overall		**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**	**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**	**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**	**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**	**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**	-
		Eastbound	left	20.3 (20.8)	C (C)	0.32 (0.42)	70 **(330)**	20.3 (20.8)	C (C)	0.32 (0.42)	70 (290)	20.3 (20.8)	C (C)	0.32 (0.42)	70 (270)	20.3 (20.8)	C (C)	0.32 (0.42)	60 (280)	20.3 (20.8)	C (C)	0.32 (0.42)	75 (350)	325
			through-right	25.7 (38.9)	C (D)	0.29 (0.76)	160 (510)	25.7 (38.9)	C (D)	0.29 (0.76)	150 (440)	25.7 (38.9)	C (D)	0.29 (0.76)	160 (430)	25.7 (38.9)	C (D)	0.29 (0.76)	150 (470)	25.7 (38.9)	C (D)	0.29 (0.76)	150 (785)	1830
		Westbound	left	15.8 (32.9)	B (C)	0.42 (0.66)	145 (220)	15.8 (32.9)	B (C)	0.42 (0.66)	145 (210)	15.8 (32.9)	B (C)	0.42 (0.66)	155 (220)	15.8 (32.9)	B (C)	0.42 (0.66)	135 (225)	15.8 (32.9)	B (C)	0.42 (0.66)	150 (230)	325
			through	26.9 (24.1)	C (C)	0.59 (0.30)	255 (180)	26.9 (24.1)	C (C)	0.59 (0.30)	255 (170)	26.9 (24.1)	C (C)	0.59 (0.30)	260 (200)	26.9 (24.1)	C (C)	0.59 (0.30)	240 (185)	26.9 (24.1)	C (C)	0.59 (0.30)	260 (210)	375
			right	20.5 (21.7)	C (C)	0.12 (0.10)	0 (5)	20.5 (21.7)	C (C)	0.12 (0.10)	0 (0)	20.5 (21.7)	C (C)	0.12 (0.10)	55 (5)	20.5 (21.7)	C (C)	0.12 (0.10)	5 (0)	20.5 (21.7)	C (C)	0.12 (0.10)	50 (5)	350
		Northbound	left	27.4 (38.6)	C (D)	0.51 (0.55)	155 (160)	27.4 (38.6)	C (D)	0.51 (0.55)	150 (135)	27.4 (38.6)	C (D)	0.51 (0.55)	160 (165)	27.4 (38.6)	C (D)	0.51 (0.55)	145 (170)	27.4 (38.6)	C (D)	0.51 (0.55)	140 (175)	250
			through	33.2 (49.8)	C (D)	0.15 (0.53)	80 (190)	33.2 (49.8)	C (D)	0.15 (0.53)	85 (155)	33.2 (49.8)	C (D)	0.15 (0.53)	75 (205)	33.2 (49.8)	C (D)	0.15 (0.53)	85 (200)	33.2 (49.8)	C (D)	0.15 (0.53)	80 (200)	1585
			right	32.4 (46.6)	C (D)	0.07 (0.27)	0 (220)	32.4 (46.6)	C (D)	0.07 (0.27)	0 (155)	32.4 (46.6)	C (D)	0.07 (0.27)	0 (195)	32.4 (46.6)	C (D)	0.07 (0.27)	0 (225)	32.4 (46.6)	C (D)	0.07 (0.27)	0 (235)	250
		Southbound	left	28.6 (36.2)	C (D)	0.23 (0.55)	100 (190)	28.6 (36.2)	C (D)	0.23 (0.55)	100 (185)	28.6 (36.2)	C (D)	0.23 (0.55)	100 (200)	28.6 (36.2)	C (D)	0.23 (0.55)	90 (200)	28.6 (36.2)	C (D)	0.23 (0.55)	90 (225)	350
			through	42.7 (53.8)	D (D)	0.62 (0.67)	240 (280)	42.7 (53.8)	D (D)	0.62 (0.67)	265 (290)	42.7 (53.8)	D (D)	0.62 (0.67)	245 (280)	42.7 (53.8)	D (D)	0.62 (0.67)	240 (290)	42.7 (53.8)	D (D)	0.62 (0.67)	250 (455)	1210
			right	35.4 (43.6)	D (D)	0.14 (0.13)	0 (75)	35.4 (43.6)	D (D)	0.14 (0.13)	55 (75)	35.4 (43.6)	D (D)	0.14 (0.13)	0 (0)	35.4 (43.6)	D (D)	0.14 (0.13)	0 (55)	35.4 (43.6)	D (D)	0.14 (0.13)	50 (125)	350
2	Jumpers Hole Rd & Ashberry Ln/Evening Star Dr	Control Type		Stop (2-Way)				Stop (All-Way)				Signal				Roundabout				Signal				-
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**9.2 (9.7)**	**A (A)**	**0.51 (0.66)**	**- (-)**	**7.2 (12.2)**	**A (B)**	**- (-)**	**- (-)**	**10.0 (9.8)**	**A (A)**	**0.51 (0.66)**	**- (-)**	-
		Eastbound	left-through-right	22.7 (293.2)	**C (F)**	0.26 (1.04)	50 (160)	10.6 (10.9)	B (B)	0.13 (0.09)	45 (40)	39.0 (40.0)	D (D)	0.20 (0.18)	65 (55)	7.2 (7.3)	A (A)	0.12 (0.08)	50 (50)	39.0 (40.0)	D (D)	0.20 (0.18)	60 (55)	305
		Westbound	left-through-right	28.0 (279.0)	**D (F)**	0.43 (1.24)	75 (435)	11.2 (11.3)	B (B)	0.21 (0.18)	65 (60)	40.8 (40.8)	D (D)	0.40 (0.27)	120 (110)	5.2 (9.1)	A (A)	0.13 (0.18)	50 (65)	40.8 (40.8)	D (D)	0.40 (0.27)	125 (105)	1035
		Northbound	left-through-right	0.1 (0.4)	A (A)	0.00 (0.02)	15 (120)	16.9 (212.3)	**C (F)**	0.61 (1.42)	125 **(185)**	2.1 (8.1)	A (A)	0.29 (0.70)	95 **(240)**	5.6 (15.2)	A (C)	0.31 (0.76)	40 **(185)**	4.6 (8.1)	A (A)	0.29 (0.70)	120 **(240)**	170
		Southbound	through	0.7 (2.9)	A (A)	0.03 (0.10)	80 (430)	97.5 (165.3)	**F (F)**	1.13 (1.30)	275 (750)	5.1 (6.6)	A (A)	0.52 (0.65)	215 (805)	8.5 (9.7)	A (A)	0.54 (0.61)	90 (300)	5.1 (6.6)	A (A)	0.52 (0.65)	210 (930)	1585
			right	0.0 (0.0)	A (A)	0.00 (0.01)	0 (80)	6.8 (6.9)	A (A)	0.00 (0.03)	45 (80)	2.2 (1.9)	A (A)	0.00 (0.01)	5 (135)	2.7 (2.7)	A (A)	0.02 (0.02)	5 (75)	2.2 (1.9)	A (A)	0.00 (0.01)	5 (180)	300
3	Jumpers Hole Rd & Woodholme Circle (N)	Control Type		Stop (2-Way)				Stop (2-Way)				Stop (2-Way)				Stop (2-Way)				Stop (2-Way)				-
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	-
		Eastbound	left-through-right	19.4 (127.1)	**C (F)**	0.03 (0.06)	35 (15)	19.4 (125.8)	**C (F)**	0.03 (0.06)	30 (60)	19.8 (43.7)	C (E)	0.04 (0.02)	35 (20)	19.4 (0.0)	C (A)	0.03 (0.00)	35 (25)	19.8 (43.8)	C (E)	0.04 (0.02)	35 (20)	875
		Westbound	left-right	18.7 (64.7)	**C (F)**	0.02 (0.14)	15 (65)	18.7 (64.1)	**C (F)**	0.02 (0.14)	25 (40)	19.3 (28.2)	C (D)	0.02 (0.06)	20 (35)	18.7 (64.1)	**C (F)**	0.02 (0.14)	25 (60)	19.3 (28.2)	C (D)	0.02 (0.06)	25 (35)	705
		Northbound	left-through-right	0.2 (0.1)	A (A)	0.00 (0.00)	40 (165)	0.2 (0.1)	A (A)	0.00 (0.00)	30 **(380)**	0.2 (0.2)	A (A)	0.00 (0.01)	35 (320)	0.0 (0.1)	A (A)	0.00 (0.00)	20 (275)	0.2 (0.2)	A (A)	0.00 (0.01)	40 (355)	365
		Southbound	left-through-right	0.0 (0.2)	A (A)	0.00 (0.01)	15 (140)	0.0 (0.2)	A (A)	0.00 (0.01)	15 (15)	0.0 (0.2)	A (A)	0.00 (0.01)	15 (100)	0.0 (0.2)	A (A)	0.00 (0.01)	0 (130)	0.0 (0.2)	A (A)	0.00 (0.01)	15 (115)	170
4	Jumpers Hole Rd & Woodholme Circle (S)	Control Type		Stop (2-Way)				Stop (2-Way)				Stop (2-Way)				Roundabout				Stop (2-Way)				-
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**7.2 (11.1)**	**A (B)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	-
		Eastbound	left-right	14.7 (41.0)	B (E)	0.03 (0.07)	25 (45)	14.7 (40.7)	B (E)	0.03 (0.07)	30 (35)	14.3 (21.4)	B (C)	0.03 (0.04)	30 (30)	5.7 (6.1)	A (A)	0.02 (0.01)	15 (20)	14.3 (21.4)	B (C)	0.03 (0.04)	30 (30)	835
		Westbound	left-right	15.6 (81.7)	**C (F)**	0.02 (0.10)	30 (30)	15.6 (80.9)	**C (F)**	0.02 (0.10)	30 (25)	14.6 (32.6)	B (D)	0.02 (0.04)	30 (20)	3.8 (7.1)	A (A)	0.01 (0.01)	10 (15)	14.6 (32.6)	B (D)	0.02 (0.04)	25 (30)	675
		Northbound	left-through-right	0.2 (0.2)	A (A)	0.00 (0.01)	20 (140)	0.2 (0.2)	A (A)	0.00 (0.01)	30 **(415)**	0.2 (0.2)	A (A)	0.00 (0.01)	20 (190)	4.9 (12.6)	A (B)	0.26 (0.71)	15 (250)	0.2 (0.2)	A (A)	0.00 (0.01)	35 (280)	370
		Southbound	left-through-right	0.0 (0.3)	A (A)	0.00 (0.01)	115 (340)	0.0 (0.3)	A (A)	0.00 (0.01)	10 (25)	0.0 (0.3)	A (A)	0.00 (0.01)	10 (165)	8.3 (9.5)	A (A)	0.53 (0.60)	50 (55)	0.0 (0.3)	A (A)	0.00 (0.01)	10 (210)	365
5	Jumpers Hole Rd & Walmart Dwy (N)	Control Type		Signal				Signal				Signal				Signal				Signal				-
		Overall		**8.1 (17.0)**	**A (B)**	**0.46 (0.66)**	**- (-)**	**7.9 (15.6)**	**A (B)**	**0.46 (0.66)**	**- (-)**	**7.4 (16.4)**	**A (B)**	**0.46 (0.66)**	**- (-)**	**7.9 (15.6)**	**A (B)**	**0.46 (0.66)**	**- (-)**	**6.4 (13.2)**	**A (B)**	**0.46 (0.66)**	**- (-)**	-
		Eastbound	left-through-right	41.4 (40.0)	D (D)	0.25 (0.22)	60 (105)	40.9 (36.6)	D (D)	0.24 (0.21)	60 (105)	40.9 (36.6)	D (D)	0.24 (0.21)	65 (95)	40.9 (36.6)	D (D)	0.24 (0.21)	60 (90)	40.8 (36.6)	D (D)	0.24 (0.21)	60 (95)	185
		Westbound	left	42.0 (43.1)	D (D)	0.31 (0.50)	45 **(115)**	41.5 (39.1)	D (D)	0.29 (0.47)	50 (95)	41.5 (39.1)	D (D)	0.29 (0.47)	50 (110)	41.5 (39.1)	D (D)	0.29 (0.47)	50 (95)	41.4 (39.1)	D (D)	0.29 (0.47)	50 (95)	100
			through	39.3 (38.7)	D (D)	0.02 (0.05)	15 (90)	39.0 (35.4)	D (D)	0.02 (0.05)	10 (135)	39.0 (35.4)	D (D)	0.02 (0.05)	15 (75)	39.0 (35.4)	D (D)	0.02 (0.05)	10 (60)	39.0 (35.4)	D (D)	0.02 (0.05)	15 (110)	820
			right	39.5 (39.0)	D (D)	0.03 (0.09)	50 **(105)**	39.1 (35.7)	D (D)	0.03 (0.09)	55 **(125)**	39.1 (35.7)	D (D)	0.03 (0.09)	55 **(110)**	39.1 (35.7)	D (D)	0.03 (0.09)	55 **(110)**	39.1 (35.7)	D (D)	0.03 (0.09)	55 **(105)**	100
		Northbound	left	4.2 (7.1)	A (A)	0.01 (0.03)	20 (60)	1.8 (3.9)	A (A)	0.01 (0.03)	20 (130)	1.8 (3.9)	A (A)	0.01 (0.03)	15 (55)	1.8 (3.9)	A (A)	0.01 (0.03)	15 (60)	- (-)	- (-)	- (-)	- (-)	125
			through-right	5.7 (18.1)	A (B)	0.23 (0.73)	125 (470)	2.6 (15.5)	A (B)	0.22 (0.72)	65 **(680)**	2.6 (15.5)	A (B)	0.22 (0.72)	65 (480)	2.6 (15.5)	A (B)	0.22 (0.72)	60 (495)	2.6 (9.5)	A (A)	0.22 (0.72)	80 (485)	655
		Southbound	left	1.8 (10.8)	A (B)	0.11 (0.44)	**160 (225)**	1.9 (10.2)	A (B)	0.11 (0.47)	65 (135)	1.8 (19.2)	A (B)	0.11 (0.47)	65 **(190)**	1.9 (10.2)	A (B)	0.11 (0.47)	50 **(155)**	1.7 (19.5)	A (B)	0.11 (0.47)	65 **(205)**	150
			through-right	4.5 (6.4)	A (A)	0.48 (0.49)	**385 (500)**	5.7 (7.6)	A (A)	0.48 (0.50)	115 (185)	4.7 (7.2)	A (A)	0.48 (0.50)	130 (350)	5.7 (7.6)	A (A)	0.48 (0.50)	125 (215)	3.0 (4.9)	A (A)	0.44 (0.50)	155 **(375)**	370
6	Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)	Control Type		Signal				Signal				Signal				Signal				Signal				-
		Overall		**50.9 (76.7)**	**D (E)**	**0.68 (0.85)**	**- (-)**	**64.4 (72.4)**	**E (E)**	**0.64 (0.84)**	**- (-)**	**63.8 (72.6)**	**E (E)**	**0.64 (0.84)**	**- (-)**	**64.4 (72.4)**	**E (E)**	**0.64 (0.84)**	**- (-)**	**64.5 (73.8)**	**E (E)**	**0.63 (0.84)**	**- (-)**	-
		Eastbound	left	63.3 (84.0)	**E (F)**	0.52 (0.87)	90 **(620)**	89.6 (99.0)	**F (F)**	0.63 (0.94)	125 **(725)**	89.6 (99.0)	**F (F)**	0.63 (0.94)	120 **(655)**	89.6 (99.0)	**F (F)**	0.63 (0.94)	115 **(760)**	89.6 (97.3)	**F (F)**	0.63 (0.93)	135 **(685)**	600
			through	50.1 (57.1)	D (E)	0.35 (0.52)	100 (500)	70.7 (62.8)	E (E)	0.43 (0.61)	135 **(1065)**	70.7 (62.8)	E (E)	0.43 (0.61)	130 (540)	70.7 (62.8)	E (E)	0.43 (0.61)	130 **(1075)**	76.3 (69.0)	E (E)	0.43 (0.70)	130 (730)	815
			right	48.1 (52.5)	D (D)	0.13 (0.25)	30 (95)	67.3 (56.6)	E (E)	0.13 (0.25)	20 (120)	67.3 (56.6)	E (E)	0.13 (0.25)	40 (90)	67.3 (56.6)	E (E)	0.13 (0.25)	30 (80)	71.7 (60.7)	E (E)	0.13 (0.25)	20 (110)	475
		Westbound	left	63.6 (91.2)	**E (F)**	0.56 (0.77)	95 (255)	89.9 (93.0)	**F (F)**	0.66 (0.80)	105 (245)	89.9 (93.0)	**F (F)**	0.66 (0.80)	120 (235)	89.9 (93.0)	**F (F)**	0.66 (0.80)	115 (240)	76.8 (76.4)	E (E)	0.50 (0.66)	110 (225)	400
			through	53.0 (73.6)	D (E)	0.61 (0.66)	130 (175)	77.0 (79.8)	E (E)	0.74 (0.77)	190 (175)	77.0 (79.8)	E (E)	0.74 (0.77)	195 (190)	77.0 (79.8)	E (E)	0.74 (0.77)	190 (180)	77.0 (81.8)	**E (F)**	0.74 (0.80)	185 (185)	1580
			right	45.9 (64.7)	D (E)	0.04 (0.11)	0 (30)	64.5 (67.0)	E (E)	0.04 (0.11)	0 (100)	64.5 (67.0)	E (E)	0.04 (0.11)	0 (50)	64.5 (67.0)	E (E)	0.04 (0.11)	0 (35)	64.5 (67.7)	E (E)	0.04 (0.11)	0 (55)	750
		Northbound	left	58.3 (108.2)	**E (F)**	0.72 (0.96)	200 **(1965)**	86.4 (98.0)	**F (F)**	0.84 (0.94)	365 (555)	86.4 (98.0)	**F (F)**	0.84 (0.94)	380 (530)	86.4 (98.0)	**F (F)**	0.84 (0.94)	335 (655)	86.4 (98.0)	**F (F)**	0.84 (0.94)	340 (500)	1690
			left-through	58.5 (119.6)	**E (F)**	0.72 (1.00)	295 **(1990)**	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	1690
			right	43.6 (57.2)	D (E)	0.05 (0.06)	0 **(1125)**	23.0 (37.5)	C (D)	0.05 (0.06)	0 (0)	23.0 (37.5)	C (D)	0.05 (0.06)	0 (0)	23.0 (37.5)	C (D)	0.05 (0.06)	0 (350)	23.0 (37.2)	C (D)	0.05 (0.06)	0 (0)	800
			through	- (-)	- (-)	- (-)	- (-)	26.1 (47.6)	C (D)	0.24 (0.51)	180 (430)	26.1 (47.6)	C (D)	0.24 (0.51)	200 (345)	26.1 (47.6)	C (D)	0.24 (0.51)	200 (-)	26.1 (47.3)	C (D)	0.24 (0.51)	195 (375)	1690
		Southbound	left	36.0 (61.1)	D (E)	0.26 (0.37)	160 **(205)**	86.9 (89.9)	**F (F)**	0.72 (0.73)	**220 (255)**	84.2 (87.7)	**F (F)**	0.72 (0.73)	**220 (250)**	86.9 (89.9)	**F (F)**	0.72 (0.73)	**215 (230)**	85.2 (89.0)	**F (F)**	0.72 (0.73)	**225 (245)**	190
			left-through	46.5 (84.6)	**D (F)**	0.71 (0.85)	590 **(750)**	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	655
			right	34.0 (57.3)	C (E)	0.10 (0.14)	255 (255)	37.0 (54.8)	D (D)	0.10 (0.09)	205 (230)	33.2 (58.3)	C (E)	0.10 (0.09)	220 (240)	37.0 (54.8)	D (D)	0.10 (0.09)	215 (245)	33.0 (63.4)	C (E)	0.10 (0.09)	200 (245)	655
			through	- (-)	- (-)	- (-)	- (-)	38.1 (66.6)	D (E)	0.48 (0.69)	450 (585)	36.3 (68.2)	D (E)	0.48 (0.69)	440 **(680)**	38.1 (66.6)	D (E)	0.48 (0.69)	425 (625)	37.2 (68.8)	D (E)	0.48 (0.68)	305 **(715)**	655
7	MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy	Control Type		Stop (T Int)				Stop (T Int)				Stop (T Int)				Stop (T Int)				Stop (T Int)				-
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	-
		Eastbound	left	8.9 (9.8)	A (A)	0.05 (0.07)	50 (50)	8.9 (9.7)	A (A)	0.05 (0.07)	45 (370)	8.9 (9.7)	A (A)	0.05 (0.07)	45 (65)	8.9 (9.7)	A (A)	0.05 (0.07)	45 (225)	8.9 (9.7)	A (A)	0.05 (0.07)	50 (60)	300
			through	0.0 (0.0)	A (A)	0.13 (0.30)	0 (10)	0.0 (0.0)	A (A)	0.13 (0.30)	0 **(1975)**	0.0 (0.0)	A (A)	0.13 (0.30)	0 (45)	0.0 (0.0)	A (A)	0.13 (0.30)	0 (575)	0.0 (0.0)	A (A)	0.13 (0.30)	0 (110)	1530
		Westbound	through-right	0.0 (0.0)	A (A)	0.21 (0.25)	10 (10)	0.0 (0.0)	A (A)	0.21 (0.25)	115 (10)	0.0 (0.0)	A (A)	0.21 (0.25)	15 (15)	0.0 (0.0)	A (A)	0.21 (0.25)	10 (5)	0.0 (0.0)	A (A)	0.21 (0.25)	25 (15)	815
		Southbound	right	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)	450
8	MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd	Control Type		Stop (T Int)				Stop (T Int)				Stop (T Int)				Stop (T Int)				Stop (T Int)				-
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	**- (-)**	-
		Eastbound	through	0.0 (0.0)	A (A)	0.11 (0.20)	0 (0)	0.0 (0.0)	A (A)	0.11 (0.20)	0 (5)	0.0 (0.0)	A (A)	0.11 (0.20)	0 (215)	0.0 (0.0)	A (A)	0.11 (0.20)	0 (0)	0.0 (0.0)	A (A)	0.11 (0.20)	0 (0)	1750
		Westbound	through	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)	545
			right	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)	75
		Southbound	right	10.1 (12.2)	B (B)	0.02 (0.02)	25 (25)	10.1 (12.2)	B (B)	0.02 (0.02)	30 (25)	10.1 (12.2)	B (B)	0.02 (0.02)	30 (25)	10.1 (12.2)	B (B)	0.02 (0.02)	30 (25)	10.1 (12.2)	B (B)	0.02 (0.02)	35 (25)	910
Alternatives Description				- Existing volumes, intersection control, and lane geometry				- Jumpers Hole Rd at MD 2 - Split phasing removal - Lane configuration changes - Cycle length reduction and coordination with Walmart Entrance signal. - Jumpers Hole Rd at Evening Star / Ashberry Ln. - Intersection control upgraded to all-way stop				- Jumpers Hole Rd at MD 2 - Split phasing removal - Lane configuration changes - Cycle length reduction and coordination with Walmart Entrance signal. - Jumpers Hole Rd at Evening Star / Ashberry Ln. - Intersection control upgraded to full signal and coordinated with Walmart Signal. *Does not include left turn lanes at JHR and Evening Star.				- Jumpers Hole Rd at MD 2 - Split phasing removal - Lane configuration changes - Cycle length reduction and coordination with Walmart Entrance signal. - Jumpers Hole Rd at Evening Star / Ashberry Ln. - Intersection control upgraded to roundabout - Jumpers Hole Rd at Woodholme Circle (S) - Intersection control upgraded to roundabout				- Jumpers Hole Rd at MD 2 - Split phasing removal - Lane configuration changes - Cycle length reduction and coordination with Walmart Entrance signal. - MD 2 left turns changed from leading to lagging. - Jumpers Hole Rd at Evening Star / Ashberry Ln. - Intersection control upgraded to full signal and coordinated with Walmart Signal. - Jumpers Hole Rd at N Walmart Ent. - Northbound left turn restricted - Jumpers Hole Rd at S Walmart Ent. - Southbound left turn coded as left turn only *Does not include left turn lanes at JHR and Evening Star.				

Corridor AM & PM Peak Travel Times for various intersection controls at Evening Star

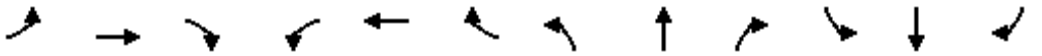






Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Future Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3319		1770	3539	1583	1770	3539	1563	1769	1863	1583
Flt Permitted	0.21	1.00		0.39	1.00	1.00	0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	398	3319		727	3539	1583	553	3539	1563	1237	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	249	176	217	885	162	181	138	102	104	266	219
RTOR Reduction (vph)	0	60	0	0	0	80	0	0	76	0	0	168
Lane Group Flow (vph)	94	365	0	217	885	82	181	138	26	104	266	51
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	49.0	40.2		59.4	45.6	45.6	40.7	27.6	27.6	34.7	24.6	24.6
Effective Green, g (s)	51.0	43.2		60.4	48.6	48.6	42.7	29.6	29.6	36.7	26.6	26.6
Actuated g/C Ratio	0.44	0.38		0.52	0.42	0.42	0.37	0.26	0.26	0.32	0.23	0.23
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	293	1245		519	1494	668	354	910	401	445	430	365
v/s Ratio Prot	0.03	0.11		c0.06	c0.25		c0.06	0.04		0.02	c0.14	
v/s Ratio Perm	0.11			0.16		0.05	0.13		0.02	0.05		0.03
v/c Ratio	0.32	0.29		0.42	0.59	0.12	0.51	0.15	0.07	0.23	0.62	0.14
Uniform Delay, d1	19.8	25.2		15.4	25.6	20.3	26.4	33.0	32.3	28.4	39.7	35.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4		0.4	1.3	0.3	0.9	0.1	0.1	0.2	3.0	0.2
Delay (s)	20.3	25.7		15.8	26.9	20.5	27.4	33.2	32.4	28.6	42.7	35.4
Level of Service	C	C		B	C	C	C	C	C	C	D	D
Approach Delay (s)		24.7			24.2			30.5			37.5	
Approach LOS		C			C			C			D	

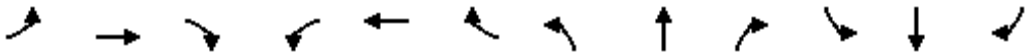
Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	1	44	39	1	59	3	320	16	26	590	3
Future Volume (Veh/h)	17	1	44	39	1	59	3	320	16	26	590	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	20	1	51	45	1	69	3	372	19	30	686	3
Pedestrians		1			3							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1112				
pX, platoon unblocked												
vC, conflicting volume	1204	1147	687	1188	1140	384	690			394		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1204	1147	687	1188	1140	384	690			394		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	99	89	68	99	90	100			97		
cM capacity (veh/h)	140	192	446	142	194	661	904			1161		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	72	115	394	716	3
Volume Left	20	45	3	30	0
Volume Right	51	69	19	0	3
cSH	274	269	904	1161	1700
Volume to Capacity	0.26	0.43	0.00	0.03	0.00
Queue Length 95th (ft)	26	51	0	2	0
Control Delay (s)	22.7	28.0	0.1	0.7	0.0
Lane LOS	C	D	A	A	
Approach Delay (s)	22.7	28.0	0.1	0.7	
Approach LOS	C	D			

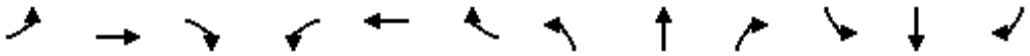
Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	63.6%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Future Volume (Veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	1	4	3	0	2	4	354	0	2	714	0
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	1083	1082	715	1086	1082	355	715			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1080	1079	715	1083	1079	347	715			347		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	192	215	430	190	215	690	885			1202		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	5	358	716
Volume Left	4	3	4	2
Volume Right	4	2	0	0
cSH	259	267	885	1202
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	19.4	18.7	0.2	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	18.7	0.2	0.0
Approach LOS	C	C		

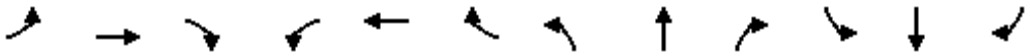
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Future Volume (Veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	0	9	3	0	5	4	348	0	1	713	0
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449				
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	1077	1071	715	1082	1071	349	713			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1056	1050	715	1061	1050	293	713			291		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	98	100	99	100			100		
cM capacity (veh/h)	191	215	430	187	215	711	887			1211		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	8	352	714
Volume Left	1	3	4	1
Volume Right	9	5	0	0
cSH	382	347	887	1211
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	14.7	15.6	0.2	0.0
Lane LOS	B	C	A	A
Approach Delay (s)	14.7	15.6	0.2	0.0
Approach LOS	B	C		

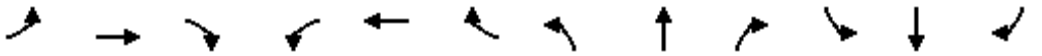
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Future Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98		0.97	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1652		1719	1863	1482	1768	1854		1647	1725	
Flt Permitted		0.84		0.73	1.00	1.00	0.43	1.00		0.53	1.00	
Satd. Flow (perm)		1419		1326	1863	1482	793	1854		922	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	4	14	27	2	44	5	286	8	92	598	28
RTOR Reduction (vph)	0	13	0	0	0	41	0	1	0	0	1	0
Lane Group Flow (vph)	0	24	0	27	2	3	5	293	0	92	625	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		6.0		6.0	6.0	6.0	62.6	61.7		74.1	68.2	
Effective Green, g (s)		6.0		6.0	6.0	6.0	62.6	61.7		74.1	68.2	
Actuated g/C Ratio		0.07		0.07	0.07	0.07	0.69	0.68		0.82	0.76	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		94		88	124	98	560	1269		817	1305	
v/s Ratio Prot					0.00		0.00	0.16		c0.01	c0.36	
v/s Ratio Perm		0.02		c0.02		0.00	0.01			0.08		
v/c Ratio		0.25		0.31	0.02	0.03	0.01	0.23		0.11	0.48	
Uniform Delay, d1		39.9		40.1	39.3	39.3	4.2	5.3		1.7	4.2	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4		2.0	0.1	0.1	0.0	0.4		0.1	0.3	
Delay (s)		41.4		42.0	39.3	39.5	4.2	5.7		1.8	4.5	
Level of Service		D		D	D	D	A	A		A	A	
Approach Delay (s)		41.4			40.4			5.7			4.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

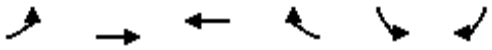
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Future Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1569	1639	1562	1625	1707	1511
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1569	1639	1562	1625	1707	1511
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	311	206	101	573	63	278	213	73	145	361	122
RTOR Reduction (vph)	0	0	168	0	0	51	0	0	57	0	0	76
Lane Group Flow (vph)	85	311	38	101	573	12	239	252	16	130	376	46
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	13.3	25.4	25.4	14.6	26.7	26.7	29.6	29.6	29.6	43.5	43.5	43.5
Effective Green, g (s)	13.3	25.4	25.4	14.6	26.7	26.7	29.6	29.6	29.6	43.5	43.5	43.5
Actuated g/C Ratio	0.10	0.18	0.18	0.10	0.19	0.19	0.21	0.21	0.21	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	163	897	279	179	943	293	333	348	332	508	533	472
v/s Ratio Prot	0.05	0.06		c0.06	c0.12		0.15	c0.15		0.08	c0.22	
v/s Ratio Perm			0.02			0.01			0.01			0.03
v/c Ratio	0.52	0.35	0.13	0.56	0.61	0.04	0.72	0.72	0.05	0.26	0.71	0.10
Uniform Delay, d1	59.9	49.6	47.6	59.2	51.4	45.8	50.9	51.0	43.5	35.7	42.2	33.9
Progression 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
Incremental Delay, d2	3.4	0.5	0.5	4.4	1.6	0.1	7.5	7.5	0.1	0.3	4.4	0.1
Delay (s)	63.3	50.1	48.1	63.6	53.0	45.9	58.3	58.5	43.6	36.0	46.5	34.0
Level of Service	E	D	D	E	D	D	E	E	D	D	D	C
Approach Delay (s)		51.3			53.9			56.5			41.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	26.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

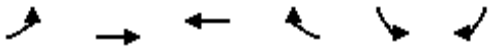
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	622	832	76	0	101
Future Volume (Veh/h)	46	622	832	76	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	655	876	80	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.91				0.91	0.91
vC, conflicting volume	876				1230	332
vC1, stage 1 conf vol					916	
vC2, stage 2 conf vol					314	
vCu, unblocked vol	502				893	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	89
cM capacity (veh/h)	960				366	983

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	48	218	218	218	350	350	255	106
Volume Left	48	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	80	106
cSH	960	1700	1700	1700	1700	1700	1700	983
Volume to Capacity	0.05	0.13	0.13	0.13	0.21	0.21	0.15	0.11
Queue Length 95th (ft)	4	0	0	0	0	0	0	9
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A							A
Approach Delay (s)	0.6				0.0			9.1
Approach LOS								A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	497	512	10	0	12
Future Volume (Veh/h)	0	497	512	10	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	540	557	11	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	568				737	278
vC1, stage 1 conf vol					557	
vC2, stage 2 conf vol					180	
vCu, unblocked vol	568				737	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1000				444	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	180	180	180	278	278	11	13
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	11	13
cSH	1700	1700	1700	1700	1700	1700	719
Volume to Capacity	0.11	0.11	0.11	0.16	0.16	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	T	L	T
Maximum Queue (ft)	102	187	195	188	283	270	168	80	94	115	272
Average Queue (ft)	31	85	44	74	155	132	82	34	40	49	152
95th Queue (ft)	70	162	122	145	253	229	156	66	78	99	240
Link Distance (ft)		1828	1828		374	374		359	359		1209
Upstream Blk Time (%)					0						
Queuing Penalty (veh)					0						
Storage Bay Dist (ft)	325			325			250			350	
Storage Blk Time (%)					0						0
Queuing Penalty (veh)					0						0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LT
Maximum Queue (ft)	58	97	31	163
Average Queue (ft)	27	44	2	17
95th Queue (ft)	51	77	16	82
Link Distance (ft)	304	136	169	537
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	48	24	76	27
Average Queue (ft)	10	2	6	1
95th Queue (ft)	35	15	38	13
Link Distance (ft)	874	707	366	169
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	30	30	38	208
Average Queue (ft)	7	9	2	22
95th Queue (ft)	27	31	19	116
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	69	55	28	64	31	163	199	379
Average Queue (ft)	29	18	2	25	3	44	53	177
95th Queue (ft)	61	46	13	52	18	122	160	385
Link Distance (ft)	187		819			323		369
Upstream Blk Time (%)								2
Queuing Penalty (veh)								15
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)						1		12
Queuing Penalty (veh)						0		10

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	T	L	LT	L
Maximum Queue (ft)	110	116	103	78	43	127	139	139	100	236	338	190
Average Queue (ft)	39	52	46	18	8	38	70	63	31	121	188	77
95th Queue (ft)	91	101	94	60	30	97	128	119	81	202	294	162
Link Distance (ft)		816	816	816			1580	1580	1580	1688	1688	187
Upstream Blk Time (%)												0
Queuing Penalty (veh)												1
Storage Bay Dist (ft)	600				475	400						
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	300	187
Average Queue (ft)	240	101
95th Queue (ft)	336	253
Link Distance (ft)	187	
Upstream Blk Time (%)	30	1
Queuing Penalty (veh)	90	0
Storage Bay Dist (ft)		200
Storage Blk Time (%)	30	1
Queuing Penalty (veh)	35	3

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	WB
Directions Served	L	TR
Maximum Queue (ft)	69	17
Average Queue (ft)	19	1
95th Queue (ft)	51	9
Link Distance (ft)		816
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

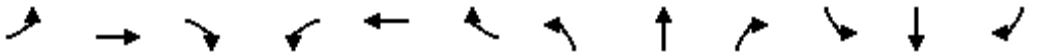
Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	7
95th Queue (ft)	26
Link Distance (ft)	912
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Jumpers Hole Rd

Movement	NB	SB	SB
Directions Served	TR	LT	T
Maximum Queue (ft)	49	174	340
Average Queue (ft)	14	30	90
95th Queue (ft)	36	130	266
Link Distance (ft)	187		323
Upstream Blk Time (%)			2
Queuing Penalty (veh)			12
Storage Bay Dist (ft)		150	
Storage Blk Time (%)		0	7
Queuing Penalty (veh)		0	21

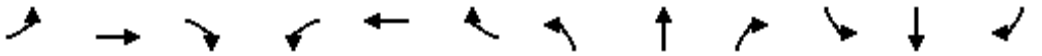
Network Summary

Network wide Queuing Penalty: 187



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Future Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3369		1770	3539	1583	1770	3539	1562	1769	1863	1583
Flt Permitted	0.48	1.00		0.10	1.00	1.00	0.31	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	889	3369		188	3539	1583	575	3539	1562	587	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	221	700	331	242	472	157	169	378	416	187	263	198
RTOR Reduction (vph)	0	25	0	0	0	86	0	0	333	0	0	156
Lane Group Flow (vph)	221	1006	0	242	472	71	169	378	83	187	263	42
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	64.4	50.8		76.9	58.3	58.3	39.5	25.2	25.2	42.9	26.9	26.9
Effective Green, g (s)	66.4	53.8		77.9	61.3	61.3	41.5	27.2	27.2	44.9	28.9	28.9
Actuated g/C Ratio	0.49	0.40		0.57	0.45	0.45	0.30	0.20	0.20	0.33	0.21	0.21
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	528	1331		364	1593	712	309	707	312	341	395	336
v/s Ratio Prot	0.04	c0.30		c0.11	0.13		0.06	0.11		c0.07	c0.14	
v/s Ratio Perm	0.16			0.27		0.04	0.11		0.05	0.11		0.03
v/c Ratio	0.42	0.76		0.66	0.30	0.10	0.55	0.53	0.27	0.55	0.67	0.13
Uniform Delay, d1	20.4	35.5		28.9	23.7	21.5	37.0	48.8	46.0	34.7	49.2	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.4		4.1	0.3	0.2	1.6	1.0	0.6	1.4	4.6	0.2
Delay (s)	20.8	38.9		32.9	24.1	21.7	38.6	49.8	46.6	36.2	53.8	43.6
Level of Service	C	D		C	C	C	D	D	D	D	D	D
Approach Delay (s)		35.7			26.1			46.5			45.6	
Approach LOS		D			C			D			D	

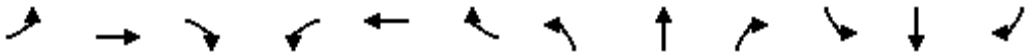
Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	27	21	2	67	13	852	52	62	730	19
Future Volume (Veh/h)	16	1	27	21	2	67	13	852	52	62	730	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	16	1	28	22	2	69	13	878	54	64	753	20
Pedestrians		1			3							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1112				
pX, platoon unblocked	0.65	0.65		0.65	0.65	0.65				0.65		
vC, conflicting volume	1883	1843	754	1844	1836	908	774			935		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2091	2029	754	2030	2018	587	774			629		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	6	97	93	3	94	79	98			90		
cM capacity (veh/h)	17	33	409	23	33	329	841			616		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	45	93	945	817	20
Volume Left	16	22	13	64	0
Volume Right	28	69	54	0	20
cSH	43	75	841	616	1700
Volume to Capacity	1.04	1.24	0.02	0.10	0.01
Queue Length 95th (ft)	105	178	1	9	0
Control Delay (s)	293.2	279.0	0.4	2.9	0.0
Lane LOS	F	F	A	A	
Approach Delay (s)	293.2	279.0	0.4	2.8	
Approach LOS	F	F			

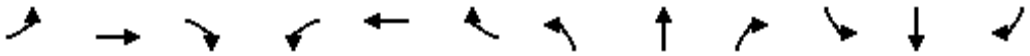
Intersection Summary				
Average Delay	21.8			
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Future Volume (Veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	4	0	6	4	947	4	5	802	3
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873				
pX, platoon unblocked	0.65	0.65		0.65	0.65	0.65				0.65		
vC, conflicting volume	1778	1774	804	1772	1774	950	806			952		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1928	1924	804	1919	1923	651	806			654		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	88	100	98	100			99		
cM capacity (veh/h)	31	43	382	33	43	303	818			604		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	10	955	810
Volume Left	2	4	4	5
Volume Right	0	6	4	3
cSH	31	70	818	604
Volume to Capacity	0.06	0.14	0.00	0.01
Queue Length 95th (ft)	5	12	0	1
Control Delay (s)	127.1	64.7	0.1	0.2
Lane LOS	F	F	A	A
Approach Delay (s)	127.1	64.7	0.1	0.2
Approach LOS	F	F		

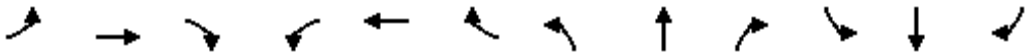
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Future Volume (Veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2	0	6	3	0	2	6	941	8	6	791	1
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449				
pX, platoon unblocked	0.66	0.66		0.66	0.66	0.66				0.66		
vC, conflicting volume	1764	1764	794	1768	1761	946	792			949		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1899	1900	794	1906	1895	662	792			667		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	98	91	100	99	99			99		
cM capacity (veh/h)	34	45	388	33	45	305	829			610		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	5	955	798
Volume Left	2	3	6	6
Volume Right	6	2	8	1
cSH	108	52	829	610
Volume to Capacity	0.07	0.10	0.01	0.01
Queue Length 95th (ft)	6	8	1	1
Control Delay (s)	41.0	81.7	0.2	0.3
Lane LOS	E	F	A	A
Approach Delay (s)	41.0	81.7	0.2	0.3
Approach LOS	E	F		

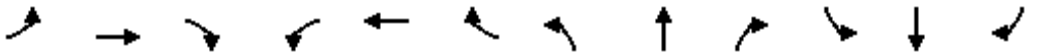
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Future Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.93		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1660		1742	1863	1510	1767	1850		1652	1720	
Flt Permitted		0.88		0.79	1.00	1.00	0.43	1.00		0.18	1.00	
Satd. Flow (perm)		1482		1456	1863	1510	809	1850		308	1720	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	8	30	81	10	139	16	783	32	185	569	38
RTOR Reduction (vph)	0	27	0	0	0	124	0	1	0	0	1	0
Lane Group Flow (vph)	0	35	0	81	10	15	16	814	0	185	606	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		10.8		10.8	10.8	10.8	60.3	58.4		76.4	69.5	
Effective Green, g (s)		10.8		10.8	10.8	10.8	60.3	58.4		76.4	69.5	
Actuated g/C Ratio		0.11		0.11	0.11	0.11	0.62	0.60		0.79	0.72	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		164		161	207	167	520	1111		421	1229	
v/s Ratio Prot					0.01		0.00	c0.44		c0.06	c0.35	
v/s Ratio Perm		0.02		c0.06		0.01	0.02			0.29		
v/c Ratio		0.22		0.50	0.05	0.09	0.03	0.73		0.44	0.49	
Uniform Delay, d1		39.3		40.7	38.6	38.8	7.1	13.8		10.0	6.1	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7		2.5	0.1	0.2	0.0	4.3		0.7	0.3	
Delay (s)		40.0		43.1	38.7	39.0	7.1	18.1		10.8	6.4	
Level of Service		D		D	D	D	A	B		B	A	
Approach Delay (s)		40.0			40.5			17.9			7.4	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

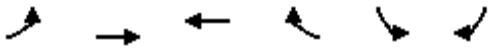
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Future Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1569	1643	1562	1625	1707	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1569	1643	1562	1625	1707	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	360	709	382	184	558	171	363	322	98	150	310	132
RTOR Reduction (vph)	0	0	276	0	0	141	0	0	77	0	0	85
Lane Group Flow (vph)	360	709	106	184	558	30	327	358	21	135	325	47
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	44.8	50.9	50.9	25.7	31.8	31.8	40.2	40.2	40.2	41.4	41.4	41.4
Effective Green, g (s)	44.8	50.9	50.9	25.7	31.8	31.8	40.2	40.2	40.2	41.4	41.4	41.4
Actuated g/C Ratio	0.24	0.28	0.28	0.14	0.17	0.17	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	416	1358	423	238	848	264	342	358	340	365	383	339
v/s Ratio Prot	c0.21	0.14		0.11	c0.11		0.21	c0.22		0.08	c0.19	
v/s Ratio Perm			0.07			0.02			0.01			0.03
v/c Ratio	0.87	0.52	0.25	0.77	0.66	0.11	0.96	1.00	0.06	0.37	0.85	0.14
Uniform Delay, d1	66.8	56.4	51.8	76.4	71.1	64.3	71.1	72.0	57.1	60.4	68.4	57.1
Progression 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
Incremental Delay, d2	17.2	0.7	0.6	14.8	2.5	0.4	37.1	47.6	0.1	0.8	16.2	0.2
Delay (s)	84.0	57.1	52.5	91.2	73.6	64.7	108.2	119.6	57.2	61.1	84.6	57.3
Level of Service	F	E	D	F	E	E	F	F	E	E	F	E
Approach Delay (s)		62.5			75.5			107.0			73.2	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	76.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	184.2	Sum of lost time (s)	26.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		

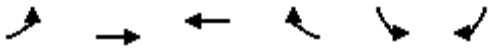
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1496	1033	41	0	71
Future Volume (Veh/h)	53	1496	1033	41	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	55	1542	1065	42	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1065				1710	376
vC1, stage 1 conf vol					1086	
vC2, stage 2 conf vol					624	
vCu, unblocked vol	693				1408	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	93
cM capacity (veh/h)	810				246	978

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	55	514	514	514	426	426	255	73
Volume Left	55	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	42	73
cSH	810	1700	1700	1700	1700	1700	1700	978
Volume to Capacity	0.07	0.30	0.30	0.30	0.25	0.25	0.15	0.07
Queue Length 95th (ft)	5	0	0	0	0	0	0	6
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS	A							A
Approach Delay (s)	0.3				0.0			9.0
Approach LOS								A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	938	945	6	0	7
Future Volume (Veh/h)	0	938	945	6	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1020	1027	7	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1034				1367	514
vC1, stage 1 conf vol					1027	
vC2, stage 2 conf vol					340	
vCu, unblocked vol	1034				1367	514
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	668				244	506

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	340	340	340	514	514	7	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	7	8
cSH	1700	1700	1700	1700	1700	1700	506
Volume to Capacity	0.20	0.20	0.20	0.30	0.30	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	349	509	542	252	225	196	9	201	194	204	247	211
Average Queue (ft)	138	302	314	127	110	86	0	85	112	121	77	101
95th Queue (ft)	328	490	510	217	181	158	6	159	178	191	222	187
Link Distance (ft)		1828	1828		374	374			362	362		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	325			325			350	250			250	350
Storage Blk Time (%)	0	7		0	0			0			0	
Queuing Penalty (veh)	0	15		0	0			0			0	

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	316	75
Average Queue (ft)	173	5
95th Queue (ft)	281	76
Link Distance (ft)	1209	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		350
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	1	0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	B30	NB	SB	SB	B21
Directions Served	LTR	LTR	T	LTR	LT	R	T
Maximum Queue (ft)	179	191	211	143	545	195	70
Average Queue (ft)	54	92	64	29	157	6	3
95th Queue (ft)	162	206	309	121	432	82	42
Link Distance (ft)	307	136	876	170	537		464
Upstream Blk Time (%)	2	26		2	2		
Queuing Penalty (veh)	0	0		14	12		
Storage Bay Dist (ft)						300	
Storage Blk Time (%)					5	0	
Queuing Penalty (veh)					1	0	

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	25	60	287	184
Average Queue (ft)	3	17	30	35
95th Queue (ft)	16	64	165	142
Link Distance (ft)	874	707	366	170
Upstream Blk Time (%)			0	3
Queuing Penalty (veh)			2	21
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	47	39	262	323
Average Queue (ft)	12	6	25	96
95th Queue (ft)	45	28	141	341
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)			0	6
Queuing Penalty (veh)			3	50
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	124	119	158	119	101	392	200	436
Average Queue (ft)	52	63	15	60	12	251	119	256
95th Queue (ft)	105	116	89	105	59	417	227	500
Link Distance (ft)	188		819			323		369
Upstream Blk Time (%)	0					6		13
Queuing Penalty (veh)	0					50		101
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		6		3	0	23	2	22
Queuing Penalty (veh)		9		2	0	4	12	40

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	LT
Maximum Queue (ft)	596	618	540	222	141	310	189	185	167	60	1707	1717
Average Queue (ft)	392	214	202	125	32	131	102	102	74	6	1237	1310
95th Queue (ft)	621	499	448	216	93	253	177	177	148	29	1964	1991
Link Distance (ft)		816	816	816			1580	1580	1580		1682	1682
Upstream Blk Time (%)		0	0								20	32
Queuing Penalty (veh)		0	0								0	0
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)	4	0				0						69
Queuing Penalty (veh)	9	0				0						66

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	825	217	298	187
Average Queue (ft)	445	121	272	105
95th Queue (ft)	1123	207	309	257
Link Distance (ft)		187	187	
Upstream Blk Time (%)		2	56	1
Queuing Penalty (veh)		5	163	0
Storage Bay Dist (ft)	800			200
Storage Blk Time (%)	0		56	1
Queuing Penalty (veh)	1		72	3

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	EB	WB
Directions Served	L	T	TR
Maximum Queue (ft)	65	14	23
Average Queue (ft)	20	1	1
95th Queue (ft)	49	11	10
Link Distance (ft)		1505	816
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	300		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	920
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: Bend

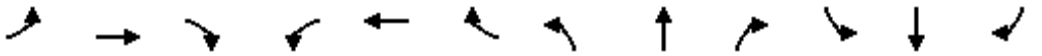
Movement	EB	EB
Directions Served	T	
Maximum Queue (ft)	357	372
Average Queue (ft)	108	60
95th Queue (ft)	337	253
Link Distance (ft)	374	374
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: Jumpers Hole Rd

Movement	WB	NB	SB	SB
Directions Served	R	TR	LT	T
Maximum Queue (ft)	100	187	175	349
Average Queue (ft)	29	70	119	245
95th Queue (ft)	70	145	217	427
Link Distance (ft)	201	187		323
Upstream Blk Time (%)		0		15
Queuing Penalty (veh)		3		98
Storage Bay Dist (ft)			150	
Storage Blk Time (%)			0	32
Queuing Penalty (veh)			0	119

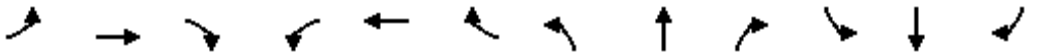
Network Summary

Network wide Queuing Penalty: 881



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Future Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3319		1770	3539	1583	1770	3539	1563	1769	1863	1583
Flt Permitted	0.21	1.00		0.39	1.00	1.00	0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	398	3319		727	3539	1583	553	3539	1563	1237	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	249	176	217	885	162	181	138	102	104	266	219
RTOR Reduction (vph)	0	60	0	0	0	80	0	0	76	0	0	168
Lane Group Flow (vph)	94	365	0	217	885	82	181	138	26	104	266	51
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	49.0	40.2		59.4	45.6	45.6	40.7	27.6	27.6	34.7	24.6	24.6
Effective Green, g (s)	51.0	43.2		60.4	48.6	48.6	42.7	29.6	29.6	36.7	26.6	26.6
Actuated g/C Ratio	0.44	0.38		0.52	0.42	0.42	0.37	0.26	0.26	0.32	0.23	0.23
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	293	1245		519	1494	668	354	910	401	445	430	365
v/s Ratio Prot	0.03	0.11		c0.06	c0.25		c0.06	0.04		0.02	c0.14	
v/s Ratio Perm	0.11			0.16		0.05	0.13		0.02	0.05		0.03
v/c Ratio	0.32	0.29		0.42	0.59	0.12	0.51	0.15	0.07	0.23	0.62	0.14
Uniform Delay, d1	19.8	25.2		15.4	25.6	20.3	26.4	33.0	32.3	28.4	39.7	35.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4		0.4	1.3	0.3	0.9	0.1	0.1	0.2	3.0	0.2
Delay (s)	20.3	25.7		15.8	26.9	20.5	27.4	33.2	32.4	28.6	42.7	35.4
Level of Service	C	C		B	C	C	C	C	C	C	D	D
Approach Delay (s)		24.7			24.2			30.5			37.5	
Approach LOS		C			C			C			D	

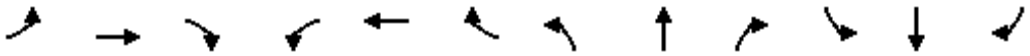
Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Future Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	20	1	51	45	1	69	3	372	19	30	686	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	72	115	394	716	3
Volume Left (vph)	20	45	3	30	0
Volume Right (vph)	51	69	19	0	3
Hadj (s)	-0.34	-0.25	0.01	0.05	-0.67
Departure Headway (s)	6.6	6.5	5.6	5.7	4.9
Degree Utilization, x	0.13	0.21	0.61	1.13	0.00
Capacity (veh/h)	503	514	626	626	716
Control Delay (s)	10.6	11.2	16.9	97.5	6.8
Approach Delay (s)	10.6	11.2	16.9	97.1	
Approach LOS	B	B	C	F	

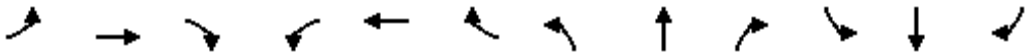
Intersection Summary				
Delay	60.4			
Level of Service	F			
Intersection Capacity Utilization	63.6%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Future Volume (Veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	1	4	3	0	2	4	354	0	2	714	0
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873				
pX, platoon unblocked												
vC, conflicting volume	1083	1082	715	1086	1082	355	715			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1083	1082	715	1086	1082	355	715			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	193	216	430	190	216	688	885			1203		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	5	358	716
Volume Left	4	3	4	2
Volume Right	4	2	0	0
cSH	260	268	885	1203
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	19.4	18.7	0.2	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	18.7	0.2	0.0
Approach LOS	C	C		

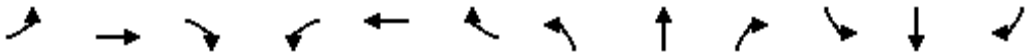
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Future Volume (Veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	0	9	3	0	5	4	348	0	1	713	0
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449				
pX, platoon unblocked	0.96	0.96		0.96	0.96	0.96				0.96		
vC, conflicting volume	1077	1071	715	1082	1071	349	713			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1058	1052	715	1064	1052	298	713			297		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	98	100	99	100			100		
cM capacity (veh/h)	192	216	430	187	216	709	887			1211		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	8	352	714
Volume Left	1	3	4	1
Volume Right	9	5	0	0
cSH	382	347	887	1211
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	14.7	15.6	0.2	0.0
Lane LOS	B	C	A	A
Approach Delay (s)	14.7	15.6	0.2	0.0
Approach LOS	B	C		

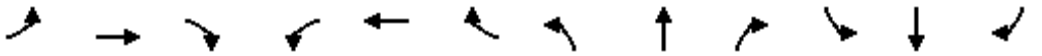
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Future Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98		0.97	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1655		1722	1863	1485	1768	1854		1647	1725	
Flt Permitted		0.84		0.73	1.00	1.00	0.41	1.00		0.54	1.00	
Satd. Flow (perm)		1421		1328	1863	1485	762	1854		939	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	4	14	27	2	44	5	286	8	92	598	28
RTOR Reduction (vph)	0	13	0	0	0	41	0	1	0	0	1	0
Lane Group Flow (vph)	0	24	0	27	2	3	5	293	0	92	625	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Effective Green, g (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Actuated g/C Ratio		0.07		0.07	0.07	0.07	0.72	0.70		0.81	0.75	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		99		92	130	103	557	1303		804	1295	
v/s Ratio Prot					0.00		0.00	0.16		c0.01	c0.36	
v/s Ratio Perm		0.02		c0.02		0.00	0.01			0.09		
v/c Ratio		0.24		0.29	0.02	0.03	0.01	0.22		0.11	0.48	
Uniform Delay, d1		39.6		39.7	39.0	39.0	3.7	4.7		1.8	4.4	
Progression Factor		1.00		1.00	1.00	1.00	0.48	0.47		1.00	1.00	
Incremental Delay, d2		1.3		1.8	0.0	0.1	0.0	0.4		0.1	1.3	
Delay (s)		40.9		41.5	39.0	39.1	1.8	2.6		1.9	5.7	
Level of Service		D		D	D	D	A	A		A	A	
Approach Delay (s)		40.9			40.0			2.6			5.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

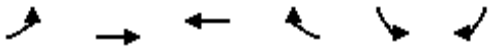
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Future Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	311	206	101	573	63	278	213	73	145	361	122
RTOR Reduction (vph)	0	0	176	0	0	53	0	0	36	0	0	56
Lane Group Flow (vph)	85	311	30	101	573	10	278	213	37	145	361	66
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Effective Green, g (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Actuated g/C Ratio	0.08	0.15	0.15	0.09	0.16	0.16	0.20	0.50	0.50	0.12	0.42	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	135	723	225	153	772	240	331	872	784	200	753	631
v/s Ratio Prot	0.05	0.06		c0.06	c0.12		c0.17	0.12		0.08	c0.20	
v/s Ratio Perm			0.02			0.01			0.02			0.04
v/c Ratio	0.63	0.43	0.13	0.66	0.74	0.04	0.84	0.24	0.05	0.72	0.48	0.10
Uniform Delay, d1	80.3	69.9	66.8	79.3	72.4	64.3	69.2	25.5	22.9	76.7	38.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	1.15
Incremental Delay, d2	9.3	0.9	0.6	10.6	4.6	0.1	17.2	0.7	0.1	11.9	2.0	0.3
Delay (s)	89.6	70.7	67.3	89.9	77.0	64.5	86.4	26.1	23.0	86.9	38.1	37.0
Level of Service	F	E	E	F	E	E	F	C	C	F	D	D
Approach Delay (s)		72.2			77.7			55.4			49.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

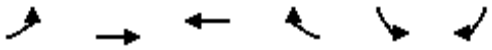
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	622	832	76	0	101
Future Volume (Veh/h)	46	622	832	76	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	655	876	80	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	876				1230	332
vC1, stage 1 conf vol					916	
vC2, stage 2 conf vol					314	
vCu, unblocked vol	466				860	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	89
cM capacity (veh/h)	981				377	974

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	48	218	218	218	350	350	255	106
Volume Left	48	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	80	106
cSH	981	1700	1700	1700	1700	1700	1700	974
Volume to Capacity	0.05	0.13	0.13	0.13	0.21	0.21	0.15	0.11
Queue Length 95th (ft)	4	0	0	0	0	0	0	9
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A							A
Approach Delay (s)	0.6				0.0			9.1
Approach LOS								A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	497	512	10	0	12
Future Volume (Veh/h)	0	497	512	10	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	540	557	11	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	568				737	278
vC1, stage 1 conf vol					557	
vC2, stage 2 conf vol					180	
vCu, unblocked vol	568				737	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1000				444	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	180	180	180	278	278	11	13
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	11	13
cSH	1700	1700	1700	1700	1700	1700	719
Volume to Capacity	0.11	0.11	0.11	0.16	0.16	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	T	L	T	R
Maximum Queue (ft)	101	171	163	212	299	285	191	94	101	127	319	75
Average Queue (ft)	35	84	44	67	158	135	78	34	42	46	157	2
95th Queue (ft)	72	152	116	143	256	243	152	70	85	98	265	53
Link Distance (ft)		1828	1828		374	374		359	359		1209	
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)	325			325			250			350		350
Storage Blk Time (%)					0	0					0	
Queuing Penalty (veh)					0	0					1	

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	57	76	144	327	79
Average Queue (ft)	25	36	73	154	3
95th Queue (ft)	45	65	122	273	47
Link Distance (ft)	304	136	169	537	
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)				300	
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				0	0

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	35	34	70	30
Average Queue (ft)	8	6	5	1
95th Queue (ft)	31	25	31	15
Link Distance (ft)	874	707	366	169
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	30	59	14
Average Queue (ft)	9	8	4	0
95th Queue (ft)	30	30	28	8
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	80	63	23	60	28	109	99	157
Average Queue (ft)	27	20	1	26	3	18	25	45
95th Queue (ft)	61	50	9	53	18	63	66	113
Link Distance (ft)	187		819			323		369
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)						0		0
Queuing Penalty (veh)						0		0

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	156	151	150	116	40	122	217	205	173	0	411	211
Average Queue (ft)	53	80	70	35	4	45	123	115	83	0	221	95
95th Queue (ft)	125	134	128	93	19	106	188	183	151	0	366	180
Link Distance (ft)		816	816	816			1580	1580	1580		1688	1688
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	251	284	187
Average Queue (ft)	125	205	63
95th Queue (ft)	219	311	207
Link Distance (ft)	187	187	
Upstream Blk Time (%)	4	14	0
Queuing Penalty (veh)	13	42	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		14	0
Queuing Penalty (veh)		16	2

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	WB	WB	WB
Directions Served	L	T	T	TR
Maximum Queue (ft)	56	162	164	38
Average Queue (ft)	16	5	5	3
95th Queue (ft)	43	114	115	19
Link Distance (ft)		816	816	816
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	300			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

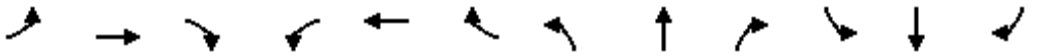
Movement	SB
Directions Served	R
Maximum Queue (ft)	33
Average Queue (ft)	10
95th Queue (ft)	32
Link Distance (ft)	912
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Jumpers Hole Rd

Movement	NB	SB	SB
Directions Served	TR	LT	T
Maximum Queue (ft)	61	150	235
Average Queue (ft)	15	17	30
95th Queue (ft)	40	75	125
Link Distance (ft)	187		323
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			1
Queuing Penalty (veh)			3

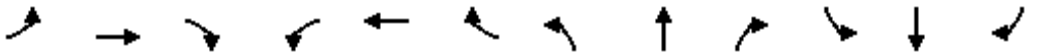
Network Summary

Network wide Queuing Penalty: 77



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Future Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3369		1770	3539	1583	1770	3539	1562	1769	1863	1583
Flt Permitted	0.48	1.00		0.10	1.00	1.00	0.31	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	889	3369		188	3539	1583	575	3539	1562	587	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	221	700	331	242	472	157	169	378	416	187	263	198
RTOR Reduction (vph)	0	25	0	0	0	86	0	0	333	0	0	156
Lane Group Flow (vph)	221	1006	0	242	472	71	169	378	83	187	263	42
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	64.4	50.8		76.9	58.3	58.3	39.5	25.2	25.2	42.9	26.9	26.9
Effective Green, g (s)	66.4	53.8		77.9	61.3	61.3	41.5	27.2	27.2	44.9	28.9	28.9
Actuated g/C Ratio	0.49	0.40		0.57	0.45	0.45	0.30	0.20	0.20	0.33	0.21	0.21
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	528	1331		364	1593	712	309	707	312	341	395	336
v/s Ratio Prot	0.04	c0.30		c0.11	0.13		0.06	0.11		c0.07	c0.14	
v/s Ratio Perm	0.16			0.27		0.04	0.11		0.05	0.11		0.03
v/c Ratio	0.42	0.76		0.66	0.30	0.10	0.55	0.53	0.27	0.55	0.67	0.13
Uniform Delay, d1	20.4	35.5		28.9	23.7	21.5	37.0	48.8	46.0	34.7	49.2	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.4		4.1	0.3	0.2	1.6	1.0	0.6	1.4	4.6	0.2
Delay (s)	20.8	38.9		32.9	24.1	21.7	38.6	49.8	46.6	36.2	53.8	43.6
Level of Service	C	D		C	C	C	D	D	D	D	D	D
Approach Delay (s)		35.7			26.1			46.5			45.6	
Approach LOS		D			C			D			D	

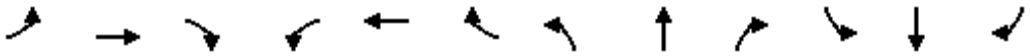
Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Future Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	16	1	28	22	2	69	13	878	54	64	753	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	45	93	945	817	20
Volume Left (vph)	16	22	13	64	0
Volume Right (vph)	28	69	54	0	20
Hadj (s)	-0.27	-0.36	0.00	0.07	-0.67
Departure Headway (s)	7.2	6.8	5.4	5.7	5.0
Degree Utilization, x	0.09	0.18	1.42	1.30	0.03
Capacity (veh/h)	487	510	672	639	708
Control Delay (s)	10.9	11.3	212.3	165.3	6.9
Approach Delay (s)	10.9	11.3	212.3	161.5	
Approach LOS	B	B	F	F	

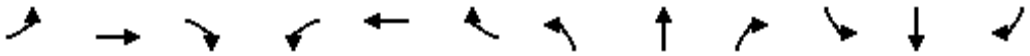
Intersection Summary				
Delay	175.7			
Level of Service	F			
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Future Volume (Veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	4	0	6	4	947	4	5	802	3
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873				
pX, platoon unblocked	0.65	0.65		0.65	0.65	0.65				0.65		
vC, conflicting volume	1778	1774	804	1772	1774	950	806			952		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1926	1921	804	1917	1920	656	806			659		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	88	100	98	100			99		
cM capacity (veh/h)	32	43	382	33	43	303	818			605		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	10	955	810
Volume Left	2	4	4	5
Volume Right	0	6	4	3
cSH	32	71	818	605
Volume to Capacity	0.06	0.14	0.00	0.01
Queue Length 95th (ft)	5	12	0	1
Control Delay (s)	125.8	64.1	0.1	0.2
Lane LOS	F	F	A	A
Approach Delay (s)	125.8	64.1	0.1	0.2
Approach LOS	F	F		

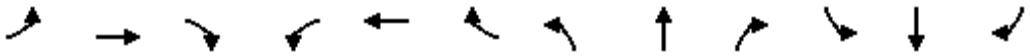
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Future Volume (Veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2	0	6	3	0	2	6	941	8	6	791	1
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449				
pX, platoon unblocked	0.67	0.67		0.67	0.67	0.67				0.67		
vC, conflicting volume	1764	1764	794	1768	1761	946	792			949		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1896	1897	794	1903	1892	668	792			672		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	98	91	100	99	99			99		
cM capacity (veh/h)	34	45	388	34	46	305	829			611		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	5	955	798
Volume Left	2	3	6	6
Volume Right	6	2	8	1
cSH	109	52	829	611
Volume to Capacity	0.07	0.10	0.01	0.01
Queue Length 95th (ft)	6	8	1	1
Control Delay (s)	40.7	80.9	0.2	0.3
Lane LOS	E	F	A	A
Approach Delay (s)	40.7	80.9	0.2	0.3
Approach LOS	E	F		

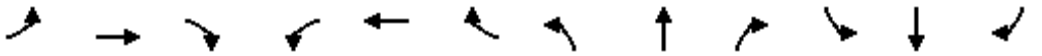
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Future Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99		0.99	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.93		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1661		1743	1863	1512	1768	1850		1652	1720	
Flt Permitted		0.88		0.82	1.00	1.00	0.43	1.00		0.18	1.00	
Satd. Flow (perm)		1484		1497	1863	1512	808	1850		320	1720	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	8	30	81	10	139	16	783	32	185	569	38
RTOR Reduction (vph)	0	27	0	0	0	123	0	1	0	0	2	0
Lane Group Flow (vph)	0	36	0	81	10	16	16	814	0	185	605	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Effective Green, g (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Actuated g/C Ratio		0.12		0.12	0.12	0.12	0.62	0.61		0.77	0.70	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173		174	217	176	515	1126		390	1209	
v/s Ratio Prot					0.01		0.00	c0.44		c0.05	0.35	
v/s Ratio Perm		0.02		c0.05		0.01	0.02			0.32		
v/c Ratio		0.21		0.47	0.05	0.09	0.03	0.72		0.47	0.50	
Uniform Delay, d1		36.0		37.1	35.3	35.5	6.5	12.3		9.3	6.1	
Progression Factor		1.00		1.00	1.00	1.00	0.60	0.98		1.00	1.00	
Incremental Delay, d2		0.6		2.0	0.1	0.2	0.0	3.4		0.9	1.5	
Delay (s)		36.6		39.1	35.4	35.7	3.9	15.5		10.2	7.6	
Level of Service		D		D	D	D	A	B		B	A	
Approach Delay (s)		36.6			36.9			15.2			8.2	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

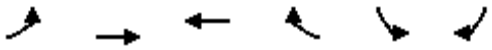
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Future Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	360	709	382	184	558	171	363	322	98	150	310	132
RTOR Reduction (vph)	0	0	292	0	0	146	0	0	62	0	0	99
Lane Group Flow (vph)	360	709	90	184	558	25	363	322	36	150	310	33
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Effective Green, g (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Actuated g/C Ratio	0.22	0.24	0.24	0.14	0.15	0.15	0.23	0.36	0.36	0.12	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	384	1160	361	231	723	225	387	632	568	205	449	376
v/s Ratio Prot	c0.21	0.14		0.11	c0.11		c0.22	0.19		0.09	c0.17	
v/s Ratio Perm			0.06			0.02			0.02			0.02
v/c Ratio	0.94	0.61	0.25	0.80	0.77	0.11	0.94	0.51	0.06	0.73	0.69	0.09
Uniform Delay, d1	68.6	61.4	55.8	75.4	73.8	66.5	67.6	44.7	37.3	76.4	61.2	51.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.96	1.05
Incremental Delay, d2	30.5	1.4	0.8	17.6	6.0	0.5	30.4	2.9	0.2	12.2	7.9	0.4
Delay (s)	99.0	62.8	56.6	93.0	79.8	67.0	98.0	47.6	37.5	89.9	66.6	54.8
Level of Service	F	E	E	F	E	E	F	D	D	F	E	D
Approach Delay (s)		70.1			80.1			69.7			69.9	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	72.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

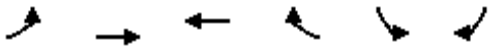
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1496	1033	41	0	71
Future Volume (Veh/h)	53	1496	1033	41	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	55	1542	1065	42	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1065				1710	376
vC1, stage 1 conf vol					1086	
vC2, stage 2 conf vol					624	
vCu, unblocked vol	680				1398	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	93
cM capacity (veh/h)	817				248	975

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	55	514	514	514	426	426	255	73
Volume Left	55	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	42	73
cSH	817	1700	1700	1700	1700	1700	1700	975
Volume to Capacity	0.07	0.30	0.30	0.30	0.25	0.25	0.15	0.07
Queue Length 95th (ft)	5	0	0	0	0	0	0	6
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS	A							A
Approach Delay (s)	0.3				0.0			9.0
Approach LOS								A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	938	945	6	0	7
Future Volume (Veh/h)	0	938	945	6	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1020	1027	7	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1034				1367	514
vC1, stage 1 conf vol					1027	
vC2, stage 2 conf vol					340	
vCu, unblocked vol	1034				1367	514
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	668				244	506

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	340	340	340	514	514	7	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	7	8
cSH	1700	1700	1700	1700	1700	1700	506
Volume to Capacity	0.20	0.20	0.20	0.30	0.30	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	T	R	L	T
Maximum Queue (ft)	349	481	478	237	204	179	160	163	168	199	218	328
Average Queue (ft)	123	265	276	124	99	74	78	100	106	43	103	172
95th Queue (ft)	289	420	438	208	167	142	135	151	155	157	183	289
Link Distance (ft)		1828	1828		374	374		362	362			1209
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	325			325			250			250	350	
Storage Blk Time (%)	0	3										0
Queuing Penalty (veh)	0	7										1

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB
Directions Served	R
Maximum Queue (ft)	149
Average Queue (ft)	5
95th Queue (ft)	75
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	350
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB	B21
Directions Served	LTR	LTR	LTR	LT	R	T
Maximum Queue (ft)	52	69	184	558	324	209
Average Queue (ft)	20	35	175	363	74	48
95th Queue (ft)	41	59	183	674	290	215
Link Distance (ft)	307	136	170	537		464
Upstream Blk Time (%)			12	23		
Queuing Penalty (veh)			106	186		
Storage Bay Dist (ft)					300	
Storage Blk Time (%)				44	0	
Queuing Penalty (veh)				8	0	

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	38	52	379	23
Average Queue (ft)	14	14	368	2
95th Queue (ft)	58	40	378	16
Link Distance (ft)	874	707	366	170
Upstream Blk Time (%)			10	
Queuing Penalty (veh)			93	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	47	42	378	52
Average Queue (ft)	8	5	357	4
95th Queue (ft)	33	24	416	26
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)			4	
Queuing Penalty (veh)			36	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	126	117	196	124	149	399	176	243
Average Queue (ft)	51	49	33	74	33	360	69	94
95th Queue (ft)	104	95	135	126	130	453	133	185
Link Distance (ft)	188		819			323		369
Upstream Blk Time (%)	0					47		0
Queuing Penalty (veh)	0					387		0
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		2		8		68	0	1
Queuing Penalty (veh)		3		7		11	1	2

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	625	832	807	255	160	286	194	203	171	171	605	503
Average Queue (ft)	603	763	210	118	40	131	103	102	73	25	352	251
95th Queue (ft)	727	1064	546	212	117	244	166	173	143	98	553	430
Link Distance (ft)		816	816	816			1580	1580	1580		1682	1682
Upstream Blk Time (%)		69	0									
Queuing Penalty (veh)		346	1									
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)	86	0										
Queuing Penalty (veh)	199	0										

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	275	289	187
Average Queue (ft)	146	232	80
95th Queue (ft)	256	321	231
Link Distance (ft)	187	187	
Upstream Blk Time (%)	9	21	1
Queuing Penalty (veh)	25	61	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		21	1
Queuing Penalty (veh)		27	2

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	EB	EB	EB	WB
Directions Served	L	T	T	T	TR
Maximum Queue (ft)	325	1541	1535	1520	20
Average Queue (ft)	125	1023	971	636	1
95th Queue (ft)	369	1973	1946	1748	8
Link Distance (ft)		1505	1505	1505	816
Upstream Blk Time (%)		42	18	1	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (ft)	300				
Storage Blk Time (%)	0	71			
Queuing Penalty (veh)	0	38			

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	8	33
Average Queue (ft)	0	6
95th Queue (ft)	6	25
Link Distance (ft)	1580	920
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bend

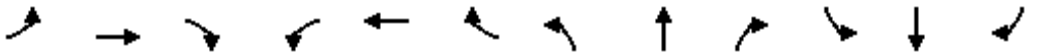
Movement	EB	EB
Directions Served	T	
Maximum Queue (ft)	336	307
Average Queue (ft)	74	25
95th Queue (ft)	270	157
Link Distance (ft)	374	374
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: Jumpers Hole Rd

Movement	WB	NB	SB	SB
Directions Served	R	TR	LT	T
Maximum Queue (ft)	225	209	174	322
Average Queue (ft)	167	174	92	83
95th Queue (ft)	269	256	183	262
Link Distance (ft)	201	187		323
Upstream Blk Time (%)	56	15		2
Queuing Penalty (veh)	0	123		14
Storage Bay Dist (ft)			150	
Storage Blk Time (%)			7	2
Queuing Penalty (veh)			21	6

Network Summary

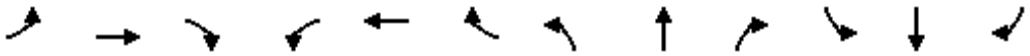
Network wide Queuing Penalty: 1711



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Future Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3319		1770	3539	1583	1770	3539	1563	1769	1863	1583
Flt Permitted	0.21	1.00		0.39	1.00	1.00	0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	398	3319		727	3539	1583	553	3539	1563	1237	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	249	176	217	885	162	181	138	102	104	266	219
RTOR Reduction (vph)	0	60	0	0	0	80	0	0	76	0	0	168
Lane Group Flow (vph)	94	365	0	217	885	82	181	138	26	104	266	51
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	49.0	40.2		59.4	45.6	45.6	40.7	27.6	27.6	34.7	24.6	24.6
Effective Green, g (s)	51.0	43.2		60.4	48.6	48.6	42.7	29.6	29.6	36.7	26.6	26.6
Actuated g/C Ratio	0.44	0.38		0.52	0.42	0.42	0.37	0.26	0.26	0.32	0.23	0.23
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	293	1245		519	1494	668	354	910	401	445	430	365
v/s Ratio Prot	0.03	0.11		c0.06	c0.25		c0.06	0.04		0.02	c0.14	
v/s Ratio Perm	0.11			0.16		0.05	0.13		0.02	0.05		0.03
v/c Ratio	0.32	0.29		0.42	0.59	0.12	0.51	0.15	0.07	0.23	0.62	0.14
Uniform Delay, d1	19.8	25.2		15.4	25.6	20.3	26.4	33.0	32.3	28.4	39.7	35.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4		0.4	1.3	0.3	0.9	0.1	0.1	0.2	3.0	0.2
Delay (s)	20.3	25.7		15.8	26.9	20.5	27.4	33.2	32.4	28.6	42.7	35.4
Level of Service	C	C		B	C	C	C	C	C	C	D	D
Approach Delay (s)		24.7			24.2			30.5			37.5	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



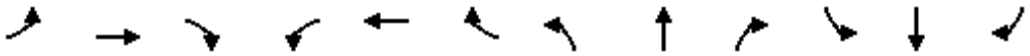
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	17	1	44	39	1	59	3	320	16	26	590	3
Future Volume (veh/h)	17	1	44	39	1	59	3	320	16	26	590	3
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	20	1	51	45	1	69	3	372	19	30	686	3
Approach Volume (veh/h)		72			115			394			719	
Crossing Volume (veh/h)		761			395			51			49	
High Capacity (veh/h)		757			1015			1331			1333	
High v/c (veh/h)		0.10			0.11			0.30			0.54	
Low Capacity (veh/h)		599			827			1112			1114	
Low v/c (veh/h)		0.12			0.14			0.35			0.65	

Intersection Summary				
Maximum v/c High	0.54			
Maximum v/c Low	0.65			
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	72	115	394	719
Demand Flow Rate, veh/h	73	117	401	734
Vehicles Circulating, veh/h	777	402	52	50
Vehicles Exiting, veh/h	7	51	798	469
Ped Vol Crossing Leg, #/h	1	3	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	5.2	5.6	8.5
Approach LOS	A	A	A	A

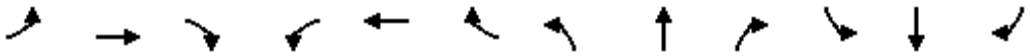
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					
Lane Util	1.000	1.000	1.000	0.996	0.004
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	73	117	401	731	3
Cap Entry Lane, veh/h	625	916	1309	1357	1357
Entry HV Adj Factor	0.986	0.983	0.981	0.980	1.000
Flow Entry, veh/h	72	115	394	716	3
Cap Entry, veh/h	616	900	1284	1330	1357
V/C Ratio	0.117	0.128	0.306	0.539	0.002
Control Delay, s/veh	7.2	5.2	5.6	8.5	2.7
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	1	3	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Future Volume (Veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	1	4	3	0	2	4	354	0	2	714	0
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1083	1082	715	1086	1082	355	715			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1083	1082	715	1086	1082	355	715			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	193	216	430	190	216	688	885			1203		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	5	358	716
Volume Left	4	3	4	2
Volume Right	4	2	0	0
cSH	260	268	885	1203
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	19.4	18.7	0.2	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	18.7	0.2	0.0
Approach LOS	C	C		

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



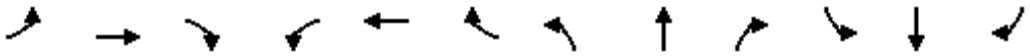
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Future Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	0	9	3	0	5	4	348	0	1	713	0
Approach Volume (veh/h)		10			8			352			714	
Crossing Volume (veh/h)		717			353			2			7	
High Capacity (veh/h)		784			1049			1382			1377	
High v/c (veh/h)		0.01			0.01			0.25			0.52	
Low Capacity (veh/h)		623			858			1159			1154	
Low v/c (veh/h)		0.02			0.01			0.30			0.62	

Intersection Summary				
Maximum v/c High	0.52			
Maximum v/c Low	0.62			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	10	8	352	714
Demand Flow Rate, veh/h	10	8	359	728
Vehicles Circulating, veh/h	731	360	2	7
Vehicles Exiting, veh/h	4	1	739	361
Ped Vol Crossing Leg, #/h	0	0	2	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.7	3.8	4.9	8.3
Approach LOS	A	A	A	A

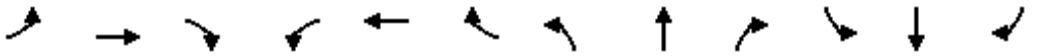
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	10	8	359	728
Cap Entry Lane, veh/h	655	956	1377	1370
Entry HV Adj Factor	1.000	1.000	0.981	0.980
Flow Entry, veh/h	10	8	352	714
Cap Entry, veh/h	655	956	1350	1343
V/C Ratio	0.015	0.008	0.261	0.531
Control Delay, s/veh	5.7	3.8	4.9	8.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Future Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98		0.97	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1655		1722	1863	1485	1768	1854		1647	1725	
Flt Permitted		0.84		0.73	1.00	1.00	0.41	1.00		0.54	1.00	
Satd. Flow (perm)		1421		1328	1863	1485	762	1854		939	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	4	14	27	2	44	5	286	8	92	598	28
RTOR Reduction (vph)	0	13	0	0	0	41	0	1	0	0	1	0
Lane Group Flow (vph)	0	24	0	27	2	3	5	293	0	92	625	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Effective Green, g (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Actuated g/C Ratio		0.07		0.07	0.07	0.07	0.72	0.70		0.81	0.75	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		99		92	130	103	557	1303		804	1295	
v/s Ratio Prot					0.00		0.00	0.16		c0.01	c0.36	
v/s Ratio Perm		0.02		c0.02		0.00	0.01			0.09		
v/c Ratio		0.24		0.29	0.02	0.03	0.01	0.22		0.11	0.48	
Uniform Delay, d1		39.6		39.7	39.0	39.0	3.7	4.7		1.8	4.4	
Progression Factor		1.00		1.00	1.00	1.00	0.48	0.47		1.00	1.00	
Incremental Delay, d2		1.3		1.8	0.0	0.1	0.0	0.4		0.1	1.3	
Delay (s)		40.9		41.5	39.0	39.1	1.8	2.6		1.9	5.7	
Level of Service		D		D	D	D	A	A		A	A	
Approach Delay (s)		40.9			40.0			2.6			5.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

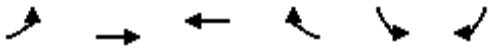
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Future Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	311	206	101	573	63	278	213	73	145	361	122
RTOR Reduction (vph)	0	0	176	0	0	53	0	0	36	0	0	56
Lane Group Flow (vph)	85	311	30	101	573	10	278	213	37	145	361	66
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Effective Green, g (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Actuated g/C Ratio	0.08	0.15	0.15	0.09	0.16	0.16	0.20	0.50	0.50	0.12	0.42	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	135	723	225	153	772	240	331	872	784	200	753	631
v/s Ratio Prot	0.05	0.06		c0.06	c0.12		c0.17	0.12		0.08	c0.20	
v/s Ratio Perm			0.02			0.01			0.02			0.04
v/c Ratio	0.63	0.43	0.13	0.66	0.74	0.04	0.84	0.24	0.05	0.72	0.48	0.10
Uniform Delay, d1	80.3	69.9	66.8	79.3	72.4	64.3	69.2	25.5	22.9	76.7	38.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	1.15
Incremental Delay, d2	9.3	0.9	0.6	10.6	4.6	0.1	17.2	0.7	0.1	11.9	2.0	0.3
Delay (s)	89.6	70.7	67.3	89.9	77.0	64.5	86.4	26.1	23.0	86.9	38.1	37.0
Level of Service	F	E	E	F	E	E	F	C	C	F	D	D
Approach Delay (s)		72.2			77.7			55.4			49.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

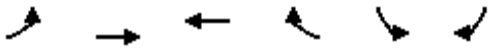
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	622	832	76	0	101
Future Volume (Veh/h)	46	622	832	76	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	655	876	80	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	876				1230	332
vC1, stage 1 conf vol					916	
vC2, stage 2 conf vol					314	
vCu, unblocked vol	466				860	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	89
cM capacity (veh/h)	981				377	974

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	48	218	218	218	350	350	255	106
Volume Left	48	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	80	106
cSH	981	1700	1700	1700	1700	1700	1700	974
Volume to Capacity	0.05	0.13	0.13	0.13	0.21	0.21	0.15	0.11
Queue Length 95th (ft)	4	0	0	0	0	0	0	9
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A							A
Approach Delay (s)	0.6				0.0			9.1
Approach LOS								A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	497	512	10	0	12
Future Volume (Veh/h)	0	497	512	10	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	540	557	11	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	568				737	278
vC1, stage 1 conf vol					557	
vC2, stage 2 conf vol					180	
vCu, unblocked vol	568				737	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1000				444	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	180	180	180	278	278	11	13
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	11	13
cSH	1700	1700	1700	1700	1700	1700	719
Volume to Capacity	0.11	0.11	0.11	0.16	0.16	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	L	T
Maximum Queue (ft)	68	183	134	162	276	262	7	170	101	100	105	278
Average Queue (ft)	28	80	36	70	153	133	0	80	36	41	47	156
95th Queue (ft)	59	152	93	136	239	220	5	143	77	83	92	239
Link Distance (ft)		1828	1828		374	374			359	359		1209
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	325			325			350	250			350	
Storage Blk Time (%)					0							0
Queuing Penalty (veh)					0							0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	68	63	67	145	11
Average Queue (ft)	18	19	10	28	0
95th Queue (ft)	49	50	42	92	5
Link Distance (ft)	289	117	156	524	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	45	30	33
Average Queue (ft)	9	5	2
95th Queue (ft)	34	23	18
Link Distance (ft)	874	707	341
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	25	24	39	90
Average Queue (ft)	2	1	2	8
95th Queue (ft)	14	11	17	48
Link Distance (ft)	810	649	343	341
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	76	63	23	64	28	97	58	166
Average Queue (ft)	27	21	1	24	3	17	22	51
95th Queue (ft)	62	50	11	54	15	61	50	127
Link Distance (ft)	187		819			323		343
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		0		0		0		0
Queuing Penalty (veh)		0		0		0		0

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	164	131	134	124	52	160	197	200	168	0	375	223
Average Queue (ft)	51	79	71	35	6	42	120	110	79	0	204	105
95th Queue (ft)	115	128	121	94	32	113	187	181	149	0	337	201
Link Distance (ft)		816	816	816			1580	1580	1580		1688	1688
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	242	280	187
Average Queue (ft)	124	207	69
95th Queue (ft)	213	315	216
Link Distance (ft)	187	187	
Upstream Blk Time (%)	3	16	0
Queuing Penalty (veh)	9	46	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		16	0
Queuing Penalty (veh)		18	1

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	WB
Directions Served	L	TR
Maximum Queue (ft)	57	20
Average Queue (ft)	14	1
95th Queue (ft)	43	10
Link Distance (ft)		816
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

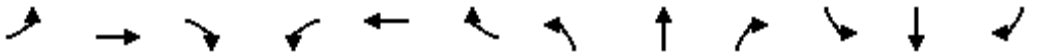
Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	912
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Jumpers Hole Rd

Movement	NB	SB	SB
Directions Served	TR	LT	T
Maximum Queue (ft)	46	102	175
Average Queue (ft)	14	14	24
95th Queue (ft)	35	61	102
Link Distance (ft)	187		323
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	
Storage Blk Time (%)		0	1
Queuing Penalty (veh)		0	2

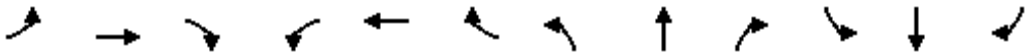
Network Summary

Network wide Queuing Penalty: 77



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Future Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3369		1770	3539	1583	1770	3539	1562	1769	1863	1583
Flt Permitted	0.48	1.00		0.10	1.00	1.00	0.31	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	889	3369		188	3539	1583	575	3539	1562	587	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	221	700	331	242	472	157	169	378	416	187	263	198
RTOR Reduction (vph)	0	25	0	0	0	86	0	0	333	0	0	156
Lane Group Flow (vph)	221	1006	0	242	472	71	169	378	83	187	263	42
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	64.4	50.8		76.9	58.3	58.3	39.5	25.2	25.2	42.9	26.9	26.9
Effective Green, g (s)	66.4	53.8		77.9	61.3	61.3	41.5	27.2	27.2	44.9	28.9	28.9
Actuated g/C Ratio	0.49	0.40		0.57	0.45	0.45	0.30	0.20	0.20	0.33	0.21	0.21
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	528	1331		364	1593	712	309	707	312	341	395	336
v/s Ratio Prot	0.04	c0.30		c0.11	0.13		0.06	0.11		c0.07	c0.14	
v/s Ratio Perm	0.16			0.27		0.04	0.11		0.05	0.11		0.03
v/c Ratio	0.42	0.76		0.66	0.30	0.10	0.55	0.53	0.27	0.55	0.67	0.13
Uniform Delay, d1	20.4	35.5		28.9	23.7	21.5	37.0	48.8	46.0	34.7	49.2	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.4		4.1	0.3	0.2	1.6	1.0	0.6	1.4	4.6	0.2
Delay (s)	20.8	38.9		32.9	24.1	21.7	38.6	49.8	46.6	36.2	53.8	43.6
Level of Service	C	D		C	C	C	D	D	D	D	D	D
Approach Delay (s)		35.7			26.1			46.5			45.6	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



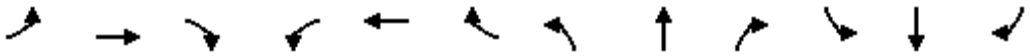
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	16	1	27	21	2	67	13	852	52	62	730	19
Future Volume (veh/h)	16	1	27	21	2	67	13	852	52	62	730	19
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	16	1	28	22	2	69	13	878	54	64	753	20
Approach Volume (veh/h)		45			93			945			837	
Crossing Volume (veh/h)		839			907			81			37	
High Capacity (veh/h)		710			672			1300			1345	
High v/c (veh/h)		0.06			0.14			0.73			0.62	
Low Capacity (veh/h)		558			525			1084			1125	
Low v/c (veh/h)		0.08			0.18			0.87			0.74	

Intersection Summary				
Maximum v/c High	0.73			
Maximum v/c Low	0.87			
Intersection Capacity Utilization	88.1%	ICU Level of Service		E

Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	45	93	945	837
Demand Flow Rate, veh/h	46	94	964	853
Vehicles Circulating, veh/h	855	925	82	37
Vehicles Exiting, veh/h	35	121	819	982
Ped Vol Crossing Leg, #/h	1	3	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.3	9.1	15.2	9.6
Approach LOS	A	A	C	A

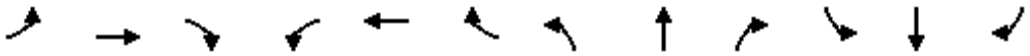
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					
Lane Util	1.000	1.000	1.000	0.977	0.023
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	46	94	964	833	20
Cap Entry Lane, veh/h	577	537	1269	1373	1373
Entry HV Adj Factor	0.978	0.989	0.981	0.981	1.000
Flow Entry, veh/h	45	93	945	817	20
Cap Entry, veh/h	564	531	1245	1347	1373
V/C Ratio	0.080	0.175	0.760	0.607	0.015
Control Delay, s/veh	7.3	9.1	15.2	9.7	2.7
LOS	A	A	C	A	A
95th %tile Queue, veh	0	1	8	4	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Future Volume (Veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	4	0	6	4	947	4	5	802	3
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1778	1774	804	1772	1774	950	806			952		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1778	1774	804	1772	1774	950	806			952		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	94	100	98	100			99		
cM capacity (veh/h)	62	82	382	64	82	315	818			721		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	10	955	810
Volume Left	2	4	4	5
Volume Right	0	6	4	3
cSH	62	123	818	721
Volume to Capacity	0.03	0.08	0.00	0.01
Queue Length 95th (ft)	2	7	0	1
Control Delay (s)	64.8	36.9	0.1	0.2
Lane LOS	F	E	A	A
Approach Delay (s)	64.8	36.9	0.1	0.2
Approach LOS	F	E		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



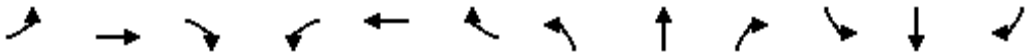
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Future Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2	0	6	3	0	2	6	941	8	6	791	1
Approach Volume (veh/h)		8			5			955			798	
Crossing Volume (veh/h)		800			949			8			9	
High Capacity (veh/h)		733			649			1376			1375	
High v/c (veh/h)		0.01			0.01			0.69			0.58	
Low Capacity (veh/h)		578			506			1153			1152	
Low v/c (veh/h)		0.01			0.01			0.83			0.69	

Intersection Summary				
Maximum v/c High	0.69			
Maximum v/c Low	0.83			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	8	5	955	798
Demand Flow Rate, veh/h	8	5	974	814
Vehicles Circulating, veh/h	816	968	8	9
Vehicles Exiting, veh/h	7	14	816	964
Ped Vol Crossing Leg, #/h	0	0	2	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.1	7.1	12.6	9.5
Approach LOS	A	A	B	A

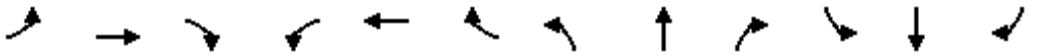
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	8	5	974	814
Cap Entry Lane, veh/h	600	514	1369	1367
Entry HV Adj Factor	1.000	1.000	0.981	0.981
Flow Entry, veh/h	8	5	955	798
Cap Entry, veh/h	600	514	1342	1340
V/C Ratio	0.013	0.010	0.712	0.595
Control Delay, s/veh	6.1	7.1	12.6	9.5
LOS	A	A	B	A
95th %tile Queue, veh	0	0	7	4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Future Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99		0.99	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.93		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1661		1743	1863	1512	1768	1850		1652	1720	
Flt Permitted		0.88		0.82	1.00	1.00	0.43	1.00		0.18	1.00	
Satd. Flow (perm)		1484		1497	1863	1512	808	1850		320	1720	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	8	30	81	10	139	16	783	32	185	569	38
RTOR Reduction (vph)	0	27	0	0	0	123	0	1	0	0	2	0
Lane Group Flow (vph)	0	36	0	81	10	16	16	814	0	185	605	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Effective Green, g (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Actuated g/C Ratio		0.12		0.12	0.12	0.12	0.62	0.61		0.77	0.70	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173		174	217	176	515	1126		390	1209	
v/s Ratio Prot					0.01		0.00	c0.44		c0.05	0.35	
v/s Ratio Perm		0.02		c0.05		0.01	0.02			0.32		
v/c Ratio		0.21		0.47	0.05	0.09	0.03	0.72		0.47	0.50	
Uniform Delay, d1		36.0		37.1	35.3	35.5	6.5	12.3		9.3	6.1	
Progression Factor		1.00		1.00	1.00	1.00	0.60	0.98		1.00	1.00	
Incremental Delay, d2		0.6		2.0	0.1	0.2	0.0	3.4		0.9	1.5	
Delay (s)		36.6		39.1	35.4	35.7	3.9	15.5		10.2	7.6	
Level of Service		D		D	D	D	A	B		B	A	
Approach Delay (s)		36.6			36.9			15.2			8.2	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

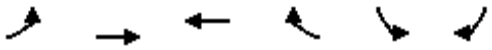
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Future Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	360	709	382	184	558	171	363	322	98	150	310	132
RTOR Reduction (vph)	0	0	292	0	0	146	0	0	62	0	0	99
Lane Group Flow (vph)	360	709	90	184	558	25	363	322	36	150	310	33
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Effective Green, g (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Actuated g/C Ratio	0.22	0.24	0.24	0.14	0.15	0.15	0.23	0.36	0.36	0.12	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	384	1160	361	231	723	225	387	632	568	205	449	376
v/s Ratio Prot	c0.21	0.14		0.11	c0.11		c0.22	0.19		0.09	c0.17	
v/s Ratio Perm			0.06			0.02			0.02			0.02
v/c Ratio	0.94	0.61	0.25	0.80	0.77	0.11	0.94	0.51	0.06	0.73	0.69	0.09
Uniform Delay, d1	68.6	61.4	55.8	75.4	73.8	66.5	67.6	44.7	37.3	76.4	61.2	51.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.96	1.05
Incremental Delay, d2	30.5	1.4	0.8	17.6	6.0	0.5	30.4	2.9	0.2	12.2	7.9	0.4
Delay (s)	99.0	62.8	56.6	93.0	79.8	67.0	98.0	47.6	37.5	89.9	66.6	54.8
Level of Service	F	E	E	F	E	E	F	D	D	F	E	D
Approach Delay (s)		70.1			80.1			69.7			69.9	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	72.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

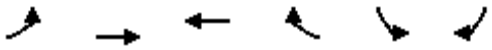
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1496	1033	41	0	71
Future Volume (Veh/h)	53	1496	1033	41	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	55	1542	1065	42	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1065				1710	376
vC1, stage 1 conf vol					1086	
vC2, stage 2 conf vol					624	
vCu, unblocked vol	680				1398	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	93
cM capacity (veh/h)	817				248	975

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	55	514	514	514	426	426	255	73
Volume Left	55	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	42	73
cSH	817	1700	1700	1700	1700	1700	1700	975
Volume to Capacity	0.07	0.30	0.30	0.30	0.25	0.25	0.15	0.07
Queue Length 95th (ft)	5	0	0	0	0	0	0	6
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS	A							A
Approach Delay (s)	0.3				0.0			9.0
Approach LOS								A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	938	945	6	0	7
Future Volume (Veh/h)	0	938	945	6	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1020	1027	7	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1034				1367	514
vC1, stage 1 conf vol					1027	
vC2, stage 2 conf vol					340	
vCu, unblocked vol	1034				1367	514
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	668				244	506

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	340	340	340	514	514	7	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	7	8
cSH	1700	1700	1700	1700	1700	1700	506
Volume to Capacity	0.20	0.20	0.20	0.30	0.30	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	T	R	L	T
Maximum Queue (ft)	349	475	506	255	238	214	200	240	261	243	249	322
Average Queue (ft)	120	284	295	127	107	82	90	126	132	76	111	178
95th Queue (ft)	279	439	468	223	186	161	169	198	207	226	201	288
Link Distance (ft)		1828	1828		374	374		362	362			1209
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	325			325			250			250	350	
Storage Blk Time (%)	0	6		0	0		0	0	0	0		0
Queuing Penalty (veh)	0	12		0	0		0	0	1	1		0

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB
Directions Served	R
Maximum Queue (ft)	75
Average Queue (ft)	2
95th Queue (ft)	53
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	350
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	60	74	160	400	147
Average Queue (ft)	19	30	90	95	10
95th Queue (ft)	48	64	184	298	73
Link Distance (ft)	291	117	156	525	
Upstream Blk Time (%)			1	0	
Queuing Penalty (veh)			8	0	
Storage Bay Dist (ft)					300
Storage Blk Time (%)				5	0
Queuing Penalty (veh)				1	0

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	36	70	344	191
Average Queue (ft)	5	17	78	26
95th Queue (ft)	23	60	274	128
Link Distance (ft)	874	707	341	156
Upstream Blk Time (%)			3	2
Queuing Penalty (veh)			31	17
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	31	277	99
Average Queue (ft)	3	3	66	11
95th Queue (ft)	19	17	249	56
Link Distance (ft)	810	649	343	341
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	123	105	134	116	125	382	187	293
Average Queue (ft)	44	50	14	64	12	195	86	110
95th Queue (ft)	91	96	62	111	58	401	157	217
Link Distance (ft)	188		819			323		343
Upstream Blk Time (%)	0					4		0
Queuing Penalty (veh)	0					29		2
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		1		3		15	0	3
Queuing Penalty (veh)		2		3		2	2	5

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	625	831	814	241	116	304	191	192	178	57	697	393
Average Queue (ft)	543	566	388	131	27	119	110	110	83	6	397	204
95th Queue (ft)	759	1075	865	212	79	239	177	179	154	34	656	350
Link Distance (ft)		816	816	816			1580	1580	1580		1682	1682
Upstream Blk Time (%)		25	0									
Queuing Penalty (veh)		123	1									
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)	46	0										
Queuing Penalty (veh)	105	1										

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	253	298	187
Average Queue (ft)	133	246	93
95th Queue (ft)	230	332	246
Link Distance (ft)	187	187	
Upstream Blk Time (%)	6	30	1
Queuing Penalty (veh)	18	87	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		30	1
Queuing Penalty (veh)		39	2

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	EB	EB	EB	WB
Directions Served	L	T	T	T	TR
Maximum Queue (ft)	224	548	470	182	11
Average Queue (ft)	60	182	141	10	0
95th Queue (ft)	225	575	497	130	5
Link Distance (ft)		1505	1505	1505	816
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300				
Storage Blk Time (%)	0	13			
Queuing Penalty (veh)	0	7			

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	920
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: Bend

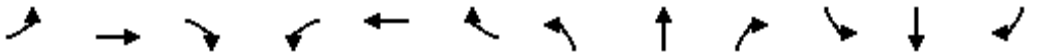
Movement	EB	EB
Directions Served	T	
Maximum Queue (ft)	380	403
Average Queue (ft)	102	48
95th Queue (ft)	324	232
Link Distance (ft)	374	374
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	1	4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: Jumpers Hole Rd

Movement	WB	NB	SB	SB
Directions Served	R	TR	LT	T
Maximum Queue (ft)	100	199	175	340
Average Queue (ft)	28	80	107	119
95th Queue (ft)	71	169	196	307
Link Distance (ft)	201	187		323
Upstream Blk Time (%)		0		2
Queuing Penalty (veh)		4		11
Storage Bay Dist (ft)			150	
Storage Blk Time (%)			5	5
Queuing Penalty (veh)			15	17

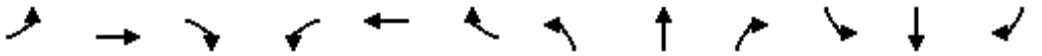
Network Summary

Network wide Queuing Penalty: 552



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Future Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3319		1770	3539	1583	1770	3539	1563	1769	1863	1583
Flt Permitted	0.21	1.00		0.39	1.00	1.00	0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	398	3319		727	3539	1583	553	3539	1563	1237	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	249	176	217	885	162	181	138	102	104	266	219
RTOR Reduction (vph)	0	60	0	0	0	80	0	0	76	0	0	168
Lane Group Flow (vph)	94	365	0	217	885	82	181	138	26	104	266	51
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	49.0	40.2		59.4	45.6	45.6	40.7	27.6	27.6	34.7	24.6	24.6
Effective Green, g (s)	51.0	43.2		60.4	48.6	48.6	42.7	29.6	29.6	36.7	26.6	26.6
Actuated g/C Ratio	0.44	0.38		0.52	0.42	0.42	0.37	0.26	0.26	0.32	0.23	0.23
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	293	1245		519	1494	668	354	910	401	445	430	365
v/s Ratio Prot	0.03	0.11		c0.06	c0.25		c0.06	0.04		0.02	c0.14	
v/s Ratio Perm	0.11			0.16		0.05	0.13		0.02	0.05		0.03
v/c Ratio	0.32	0.29		0.42	0.59	0.12	0.51	0.15	0.07	0.23	0.62	0.14
Uniform Delay, d1	19.8	25.2		15.4	25.6	20.3	26.4	33.0	32.3	28.4	39.7	35.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4		0.4	1.3	0.3	0.9	0.1	0.1	0.2	3.0	0.2
Delay (s)	20.3	25.7		15.8	26.9	20.5	27.4	33.2	32.4	28.6	42.7	35.4
Level of Service	C	C		B	C	C	C	C	C	C	D	D
Approach Delay (s)		24.7			24.2			30.5			37.5	
Approach LOS		C			C			C			D	

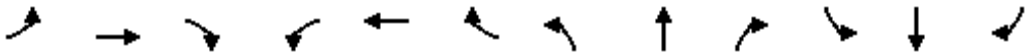
Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Future Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	6.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00			1.00	0.98
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.90			0.92			0.99			1.00	0.85
Flt Protected		0.99			0.98			1.00			1.00	1.00
Satd. Flow (prot)		1662			1679			1724			1797	1496
Flt Permitted		0.86			0.89			1.00			0.97	1.00
Satd. Flow (perm)		1448			1522			1719			1754	1496
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	20	1	51	45	1	69	3	372	19	30	686	3
RTOR Reduction (vph)	0	47	0	0	63	0	0	1	0	0	0	1
Lane Group Flow (vph)	0	25	0	0	52	0	0	393	0	0	716	2
Confl. Peds. (#/hr)							1		3	3		1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.8			7.8			70.2			70.2	70.2
Effective Green, g (s)		7.8			7.8			70.2			70.2	70.2
Actuated g/C Ratio		0.09			0.09			0.78			0.78	0.78
Clearance Time (s)		6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		125			131			1340			1368	1166
v/s Ratio Prot												
v/s Ratio Perm		0.02			c0.03			0.23			c0.41	0.00
v/c Ratio		0.20			0.40			0.29			0.52	0.00
Uniform Delay, d1		38.2			38.9			2.8			3.7	2.2
Progression Factor		1.00			1.00			0.54			1.00	1.00
Incremental Delay, d2		0.8			2.0			0.6			1.4	0.0
Delay (s)		39.0			40.8			2.1			5.1	2.2
Level of Service		D			D			A			A	A
Approach Delay (s)		39.0			40.8			2.1			5.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

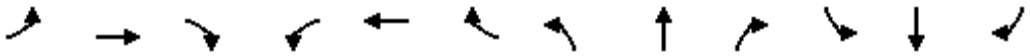
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Future Volume (Veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	1	4	3	0	2	4	354	0	2	714	0
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873			239	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1083	1082	715	1086	1082	355	715			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1013	1012	583	1016	1012	355	583			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	184	203	438	182	203	688	848			1203		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	5	358	716
Volume Left	4	3	4	2
Volume Right	4	2	0	0
cSH	252	257	848	1203
Volume to Capacity	0.04	0.02	0.00	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	19.8	19.3	0.2	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	19.8	19.3	0.2	0.0
Approach LOS	C	C		

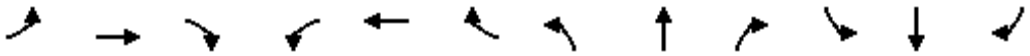
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Future Volume (Veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	0	9	3	0	5	4	348	0	1	713	0
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449			663	
pX, platoon unblocked	0.89	0.89	0.87	0.89	0.89	0.96	0.87			0.96		
vC, conflicting volume	1077	1071	715	1082	1071	349	713			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	917	910	594	923	910	298	592			297		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	99	100	99	100			100		
cM capacity (veh/h)	222	242	437	216	242	709	853			1211		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	8	352	714
Volume Left	1	3	4	1
Volume Right	9	5	0	0
cSH	398	383	853	1211
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	14.3	14.6	0.2	0.0
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	14.6	0.2	0.0
Approach LOS	B	B		

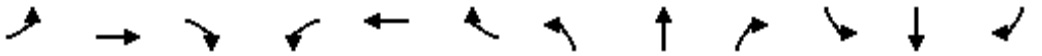
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Future Volume (vph)	18	4	13	26	2	42	5	275	8	88	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98		0.97	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1655		1722	1863	1485	1768	1854		1647	1725	
Flt Permitted		0.84		0.73	1.00	1.00	0.41	1.00		0.54	1.00	
Satd. Flow (perm)		1421		1328	1863	1485	762	1854		939	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	4	14	27	2	44	5	286	8	92	598	28
RTOR Reduction (vph)	0	13	0	0	0	41	0	1	0	0	1	0
Lane Group Flow (vph)	0	24	0	27	2	3	5	293	0	92	625	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Effective Green, g (s)		6.3		6.3	6.3	6.3	64.4	63.3		73.0	67.6	
Actuated g/C Ratio		0.07		0.07	0.07	0.07	0.72	0.70		0.81	0.75	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		99		92	130	103	557	1303		804	1295	
v/s Ratio Prot					0.00		0.00	0.16		c0.01	c0.36	
v/s Ratio Perm		0.02		c0.02		0.00	0.01			0.09		
v/c Ratio		0.24		0.29	0.02	0.03	0.01	0.22		0.11	0.48	
Uniform Delay, d1		39.6		39.7	39.0	39.0	3.7	4.7		1.8	4.4	
Progression Factor		1.00		1.00	1.00	1.00	0.48	0.47		0.93	0.80	
Incremental Delay, d2		1.3		1.8	0.0	0.1	0.0	0.4		0.1	1.2	
Delay (s)		40.9		41.5	39.0	39.1	1.8	2.6		1.8	4.7	
Level of Service		D		D	D	D	A	A		A	A	
Approach Delay (s)		40.9			40.0			2.6			4.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

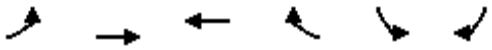
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Future Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	311	206	101	573	63	278	213	73	145	361	122
RTOR Reduction (vph)	0	0	176	0	0	53	0	0	36	0	0	56
Lane Group Flow (vph)	85	311	30	101	573	10	278	213	37	145	361	66
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Effective Green, g (s)	14.3	26.5	26.5	16.1	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Actuated g/C Ratio	0.08	0.15	0.15	0.09	0.16	0.16	0.20	0.50	0.50	0.12	0.42	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	135	723	225	153	772	240	331	872	784	200	753	631
v/s Ratio Prot	0.05	0.06		c0.06	c0.12		c0.17	0.12		0.08	c0.20	
v/s Ratio Perm			0.02			0.01			0.02			0.04
v/c Ratio	0.63	0.43	0.13	0.66	0.74	0.04	0.84	0.24	0.05	0.72	0.48	0.10
Uniform Delay, d1	80.3	69.9	66.8	79.3	72.4	64.3	69.2	25.5	22.9	76.7	38.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.90	1.03
Incremental Delay, d2	9.3	0.9	0.6	10.6	4.6	0.1	17.2	0.7	0.1	11.9	2.0	0.3
Delay (s)	89.6	70.7	67.3	89.9	77.0	64.5	86.4	26.1	23.0	84.2	36.3	33.2
Level of Service	F	E	E	F	E	E	F	C	C	F	D	C
Approach Delay (s)		72.2			77.7			55.4			46.8	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

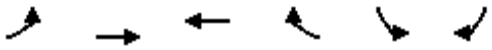
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	622	832	76	0	101
Future Volume (Veh/h)	46	622	832	76	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	655	876	80	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	876				1230	332
vC1, stage 1 conf vol					916	
vC2, stage 2 conf vol					314	
vCu, unblocked vol	466				860	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	89
cM capacity (veh/h)	981				377	974

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	48	218	218	218	350	350	255	106
Volume Left	48	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	80	106
cSH	981	1700	1700	1700	1700	1700	1700	974
Volume to Capacity	0.05	0.13	0.13	0.13	0.21	0.21	0.15	0.11
Queue Length 95th (ft)	4	0	0	0	0	0	0	9
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A							A
Approach Delay (s)	0.6				0.0			9.1
Approach LOS								A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	497	512	10	0	12
Future Volume (Veh/h)	0	497	512	10	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	540	557	11	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	568				737	278
vC1, stage 1 conf vol					557	
vC2, stage 2 conf vol					180	
vCu, unblocked vol	568				737	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1000				444	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	180	180	180	278	278	11	13
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	11	13
cSH	1700	1700	1700	1700	1700	1700	719
Volume to Capacity	0.11	0.11	0.11	0.16	0.16	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	B29	B29	NB	NB	NB
Directions Served	L	T	TR	L	T	T	R	T	T	L	T	T
Maximum Queue (ft)	91	191	153	239	327	320	75	4	4	201	80	85
Average Queue (ft)	31	86	43	70	155	136	2	0	0	85	32	37
95th Queue (ft)	69	159	110	153	259	240	53	3	3	160	64	73
Link Distance (ft)		1828	1828		374	374		898	898		359	359
Upstream Blk Time (%)					0	0						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (ft)	325			325			350			250		
Storage Blk Time (%)				0	0	0				0		
Queuing Penalty (veh)				0	1	0				0		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	124	283
Average Queue (ft)	46	151
95th Queue (ft)	98	245
Link Distance (ft)		1209
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	350	
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	79	141	143	264	8
Average Queue (ft)	31	62	31	90	0
95th Queue (ft)	64	118	95	215	4
Link Distance (ft)	304	136	169	537	
Upstream Blk Time (%)		1	0		
Queuing Penalty (veh)		0	1		
Storage Bay Dist (ft)					300
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	44	30	68	28
Average Queue (ft)	9	4	4	1
95th Queue (ft)	34	21	35	14
Link Distance (ft)	874	707	366	169
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	35	39	10
Average Queue (ft)	8	8	3	1
95th Queue (ft)	29	30	20	9
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	76	61	33	68	22	107	102	170
Average Queue (ft)	28	18	2	24	2	20	24	50
95th Queue (ft)	64	50	15	54	13	67	63	130
Link Distance (ft)	187		819			323		369
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		0		0		0		0
Queuing Penalty (veh)		0		0		0		0

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	T	L	T	L
Maximum Queue (ft)	147	137	128	110	80	168	217	196	157	400	235	256
Average Queue (ft)	52	77	70	35	8	45	126	119	82	229	106	128
95th Queue (ft)	122	131	125	94	39	121	194	191	152	380	200	220
Link Distance (ft)		816	816	816			1580	1580	1580	1688	1688	187
Upstream Blk Time (%)												4
Queuing Penalty (veh)												12
Storage Bay Dist (ft)	600				475	400						
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	288	187
Average Queue (ft)	205	71
95th Queue (ft)	303	218
Link Distance (ft)	187	
Upstream Blk Time (%)	14	0
Queuing Penalty (veh)	40	0
Storage Bay Dist (ft)		200
Storage Blk Time (%)	14	0
Queuing Penalty (veh)	16	1

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	WB
Directions Served	L	TR
Maximum Queue (ft)	61	41
Average Queue (ft)	17	2
95th Queue (ft)	47	17
Link Distance (ft)		816
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

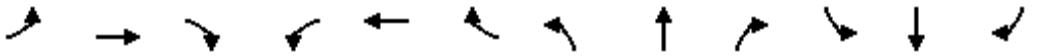
Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	10
95th Queue (ft)	31
Link Distance (ft)	912
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Jumpers Hole Rd

Movement	NB	SB	SB
Directions Served	TR	LT	T
Maximum Queue (ft)	54	111	211
Average Queue (ft)	15	13	23
95th Queue (ft)	40	61	113
Link Distance (ft)	187		323
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)		150	
Storage Blk Time (%)		0	1
Queuing Penalty (veh)		0	2

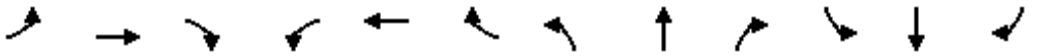
Network Summary

Network wide Queuing Penalty: 74



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Future Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3369		1770	3539	1583	1770	3539	1562	1769	1863	1583
Flt Permitted	0.48	1.00		0.10	1.00	1.00	0.31	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	889	3369		188	3539	1583	575	3539	1562	587	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	221	700	331	242	472	157	169	378	416	187	263	198
RTOR Reduction (vph)	0	25	0	0	0	86	0	0	333	0	0	156
Lane Group Flow (vph)	221	1006	0	242	472	71	169	378	83	187	263	42
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	64.4	50.8		76.9	58.3	58.3	39.5	25.2	25.2	42.9	26.9	26.9
Effective Green, g (s)	66.4	53.8		77.9	61.3	61.3	41.5	27.2	27.2	44.9	28.9	28.9
Actuated g/C Ratio	0.49	0.40		0.57	0.45	0.45	0.30	0.20	0.20	0.33	0.21	0.21
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	528	1331		364	1593	712	309	707	312	341	395	336
v/s Ratio Prot	0.04	c0.30		c0.11	0.13		0.06	0.11		c0.07	c0.14	
v/s Ratio Perm	0.16			0.27		0.04	0.11		0.05	0.11		0.03
v/c Ratio	0.42	0.76		0.66	0.30	0.10	0.55	0.53	0.27	0.55	0.67	0.13
Uniform Delay, d1	20.4	35.5		28.9	23.7	21.5	37.0	48.8	46.0	34.7	49.2	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.4		4.1	0.3	0.2	1.6	1.0	0.6	1.4	4.6	0.2
Delay (s)	20.8	38.9		32.9	24.1	21.7	38.6	49.8	46.6	36.2	53.8	43.6
Level of Service	C	D		C	C	C	D	D	D	D	D	D
Approach Delay (s)		35.7			26.1			46.5			45.6	
Approach LOS		D			C			D			D	

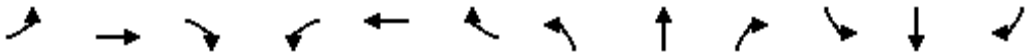
Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Future Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	6.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00			1.00	0.98
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.92			0.90			0.99			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1676			1657			1721			1793	1496
Flt Permitted		0.87			0.91			0.99			0.87	1.00
Satd. Flow (perm)		1486			1517			1701			1571	1496
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	1	28	22	2	69	13	878	54	64	753	20
RTOR Reduction (vph)	0	26	0	0	64	0	0	1	0	0	0	4
Lane Group Flow (vph)	0	19	0	0	29	0	0	944	0	0	817	16
Confl. Peds. (#/hr)							1		3	3		1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		6.5			6.5			71.5			71.5	71.5
Effective Green, g (s)		6.5			6.5			71.5			71.5	71.5
Actuated g/C Ratio		0.07			0.07			0.79			0.79	0.79
Clearance Time (s)		6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		107			109			1351			1248	1188
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.02			c0.55			0.52	0.01
v/c Ratio		0.18			0.27			0.70			0.65	0.01
Uniform Delay, d1		39.2			39.5			4.3			4.0	1.9
Progression Factor		1.00			1.00			1.34			1.00	1.00
Incremental Delay, d2		0.8			1.3			2.4			2.7	0.0
Delay (s)		40.0			40.8			8.1			6.6	1.9
Level of Service		D			D			A			A	A
Approach Delay (s)		40.0			40.8			8.1			6.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

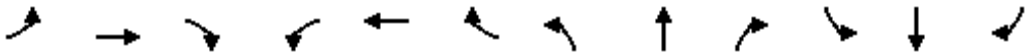
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Future Volume (Veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	4	0	6	4	947	4	5	802	3
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873			239	
pX, platoon unblocked	0.74	0.74	0.82	0.74	0.74	0.65	0.82			0.65		
vC, conflicting volume	1778	1774	804	1772	1774	950	806			952		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1328	1324	652	1320	1323	656	654			659		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	96	100	98	99			99		
cM capacity (veh/h)	95	114	383	98	114	303	764			605		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	10	955	810
Volume Left	2	4	4	5
Volume Right	0	6	4	3
cSH	95	165	764	605
Volume to Capacity	0.02	0.06	0.01	0.01
Queue Length 95th (ft)	2	5	0	1
Control Delay (s)	43.7	28.2	0.2	0.2
Lane LOS	E	D	A	A
Approach Delay (s)	43.7	28.2	0.2	0.2
Approach LOS	E	D		

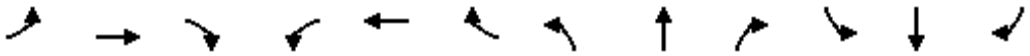
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Future Volume (Veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2	0	6	3	0	2	6	941	8	6	791	1
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449			663	
pX, platoon unblocked	0.76	0.76	0.82	0.76	0.76	0.67	0.82			0.67		
vC, conflicting volume	1764	1764	794	1768	1761	946	792			949		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1308	1310	637	1315	1305	668	635			672		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	97	100	99	99			99		
cM capacity (veh/h)	101	118	390	99	119	305	776			611		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	5	955	798
Volume Left	2	3	6	6
Volume Right	6	2	8	1
cSH	227	136	776	611
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	1	1
Control Delay (s)	21.4	32.6	0.2	0.3
Lane LOS	C	D	A	A
Approach Delay (s)	21.4	32.6	0.2	0.3
Approach LOS	C	D		

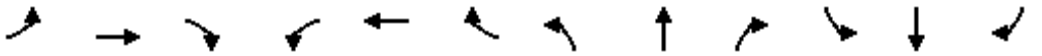
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Future Volume (vph)	24	8	29	79	10	136	16	767	31	181	558	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98		1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99		0.99	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.93		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1661		1743	1863	1512	1768	1850		1652	1720	
Flt Permitted		0.88		0.82	1.00	1.00	0.43	1.00		0.18	1.00	
Satd. Flow (perm)		1484		1497	1863	1512	808	1850		320	1720	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	8	30	81	10	139	16	783	32	185	569	38
RTOR Reduction (vph)	0	27	0	0	0	123	0	1	0	0	2	0
Lane Group Flow (vph)	0	36	0	81	10	16	16	814	0	185	605	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Effective Green, g (s)		10.5		10.5	10.5	10.5	56.0	54.8		69.5	63.3	
Actuated g/C Ratio		0.12		0.12	0.12	0.12	0.62	0.61		0.77	0.70	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173		174	217	176	515	1126		390	1209	
v/s Ratio Prot					0.01		0.00	c0.44		c0.05	0.35	
v/s Ratio Perm		0.02		c0.05		0.01	0.02			0.32		
v/c Ratio		0.21		0.47	0.05	0.09	0.03	0.72		0.47	0.50	
Uniform Delay, d1		36.0		37.1	35.3	35.5	6.5	12.3		9.3	6.1	
Progression Factor		1.00		1.00	1.00	1.00	0.60	0.98		1.98	0.99	
Incremental Delay, d2		0.6		2.0	0.1	0.2	0.0	3.4		0.7	1.2	
Delay (s)		36.6		39.1	35.4	35.7	3.9	15.5		19.2	7.2	
Level of Service		D		D	D	D	A	B		B	A	
Approach Delay (s)		36.6			36.9			15.2			10.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

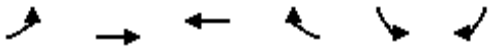
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Future Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	360	709	382	184	558	171	363	322	98	150	310	132
RTOR Reduction (vph)	0	0	292	0	0	146	0	0	62	0	0	99
Lane Group Flow (vph)	360	709	90	184	558	25	363	322	36	150	310	33
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Effective Green, g (s)	40.4	42.5	42.5	24.4	26.5	26.5	42.2	65.5	65.5	21.6	44.9	44.9
Actuated g/C Ratio	0.22	0.24	0.24	0.14	0.15	0.15	0.23	0.36	0.36	0.12	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	384	1160	361	231	723	225	387	632	568	205	449	376
v/s Ratio Prot	c0.21	0.14		0.11	c0.11		c0.22	0.19		0.09	c0.17	
v/s Ratio Perm			0.06			0.02			0.02			0.02
v/c Ratio	0.94	0.61	0.25	0.80	0.77	0.11	0.94	0.51	0.06	0.73	0.69	0.09
Uniform Delay, d1	68.6	61.4	55.8	75.4	73.8	66.5	67.6	44.7	37.3	76.4	61.2	51.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.12
Incremental Delay, d2	30.5	1.4	0.8	17.6	6.0	0.5	30.4	2.9	0.2	12.2	7.9	0.4
Delay (s)	99.0	62.8	56.6	93.0	79.8	67.0	98.0	47.6	37.5	87.7	68.2	58.3
Level of Service	F	E	E	F	E	E	F	D	D	F	E	E
Approach Delay (s)		70.1			80.1			69.7			71.0	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	72.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

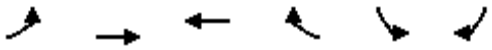
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1496	1033	41	0	71
Future Volume (Veh/h)	53	1496	1033	41	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	55	1542	1065	42	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1065				1710	376
vC1, stage 1 conf vol					1086	
vC2, stage 2 conf vol					624	
vCu, unblocked vol	680				1398	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	93
cM capacity (veh/h)	817				248	975

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	55	514	514	514	426	426	255	73
Volume Left	55	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	42	73
cSH	817	1700	1700	1700	1700	1700	1700	975
Volume to Capacity	0.07	0.30	0.30	0.30	0.25	0.25	0.15	0.07
Queue Length 95th (ft)	5	0	0	0	0	0	0	6
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS	A							A
Approach Delay (s)	0.3				0.0			9.0
Approach LOS								A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	938	945	6	0	7
Future Volume (Veh/h)	0	938	945	6	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1020	1027	7	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1034				1367	514
vC1, stage 1 conf vol					1027	
vC2, stage 2 conf vol					340	
vCu, unblocked vol	1034				1367	514
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	668				244	506

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	340	340	340	514	514	7	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	7	8
cSH	1700	1700	1700	1700	1700	1700	506
Volume to Capacity	0.20	0.20	0.20	0.30	0.30	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	350	452	474	263	257	220	7	189	208	238	242	234
Average Queue (ft)	118	277	288	129	119	95	0	90	118	129	59	111
95th Queue (ft)	269	405	430	219	199	174	5	163	191	205	195	200
Link Distance (ft)		1828	1828		374	374			362	362		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	325			325			350	250			250	350
Storage Blk Time (%)	0	4		0	0			0	0	0	0	
Queuing Penalty (veh)	0	9		0	0			0	0	0	1	

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB
Directions Served	T
Maximum Queue (ft)	305
Average Queue (ft)	184
95th Queue (ft)	278
Link Distance (ft)	1209
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB	B21	B22
Directions Served	LTR	LTR	LTR	LT	R	T	T
Maximum Queue (ft)	71	151	184	631	262	364	122
Average Queue (ft)	24	60	138	329	18	52	8
95th Queue (ft)	56	108	242	658	137	268	91
Link Distance (ft)	307	136	170	537		464	362
Upstream Blk Time (%)		1	9	10		2	0
Queuing Penalty (veh)		0	82	82		17	1
Storage Bay Dist (ft)					300		
Storage Blk Time (%)				19	0		
Queuing Penalty (veh)				4	0		

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	28	43	378	141
Average Queue (ft)	3	11	118	20
95th Queue (ft)	18	36	321	101
Link Distance (ft)	874	707	366	170
Upstream Blk Time (%)			2	1
Queuing Penalty (veh)			15	5
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	30	316	240
Average Queue (ft)	8	3	40	30
95th Queue (ft)	29	18	190	165
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)			0	1
Queuing Penalty (veh)			1	4
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	112	122	143	113	82	382	200	413
Average Queue (ft)	49	56	15	63	13	185	93	155
95th Queue (ft)	95	108	76	107	53	374	188	349
Link Distance (ft)	188		819			323		369
Upstream Blk Time (%)						3		2
Queuing Penalty (veh)						24		14
Storage Bay Dist (ft)		100		100	125		150	
Storage Blk Time (%)		3		3		12	1	8
Queuing Penalty (veh)		4		2		2	7	14

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	597	591	414	245	130	266	207	202	191	89	586	398
Average Queue (ft)	422	235	201	131	32	126	111	109	82	10	354	213
95th Queue (ft)	653	541	432	211	91	237	184	187	159	48	529	344
Link Distance (ft)		816	816	816			1580	1580	1580		1682	1682
Upstream Blk Time (%)		1										
Queuing Penalty (veh)		3										
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)	5											
Queuing Penalty (veh)	12											

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	265	295	187
Average Queue (ft)	143	238	85
95th Queue (ft)	252	331	238
Link Distance (ft)	187	187	
Upstream Blk Time (%)	8	30	1
Queuing Penalty (veh)	22	86	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		30	1
Queuing Penalty (veh)		38	2

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	EB	EB	EB	WB
Directions Served	L	T	T	T	TR
Maximum Queue (ft)	84	43	36	25	29
Average Queue (ft)	28	3	2	1	1
95th Queue (ft)	63	43	36	18	14
Link Distance (ft)		1505	1505	1505	816
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	306	28
Average Queue (ft)	10	7
95th Queue (ft)	216	26
Link Distance (ft)	1580	920
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bend

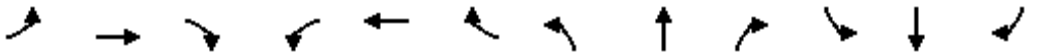
Movement	EB	EB
Directions Served	T	
Maximum Queue (ft)	340	314
Average Queue (ft)	95	35
95th Queue (ft)	306	180
Link Distance (ft)	374	374
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: Jumpers Hole Rd

Movement	WB	NB	SB	SB
Directions Served	R	TR	LT	T
Maximum Queue (ft)	85	182	175	345
Average Queue (ft)	26	73	115	133
95th Queue (ft)	63	154	209	354
Link Distance (ft)	201	187		323
Upstream Blk Time (%)		1		4
Queuing Penalty (veh)		6		28
Storage Bay Dist (ft)			150	
Storage Blk Time (%)			8	8
Queuing Penalty (veh)			22	30

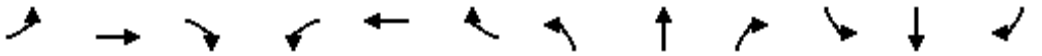
Network Summary

Network wide Queuing Penalty: 538



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Future Volume (vph)	88	234	165	204	832	152	170	130	96	98	250	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3319		1770	3539	1583	1770	3539	1563	1769	1863	1583
Flt Permitted	0.21	1.00		0.39	1.00	1.00	0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	398	3319		727	3539	1583	553	3539	1563	1237	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	249	176	217	885	162	181	138	102	104	266	219
RTOR Reduction (vph)	0	60	0	0	0	80	0	0	76	0	0	168
Lane Group Flow (vph)	94	365	0	217	885	82	181	138	26	104	266	51
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	49.0	40.2		59.4	45.6	45.6	40.7	27.6	27.6	34.7	24.6	24.6
Effective Green, g (s)	51.0	43.2		60.4	48.6	48.6	42.7	29.6	29.6	36.7	26.6	26.6
Actuated g/C Ratio	0.44	0.38		0.52	0.42	0.42	0.37	0.26	0.26	0.32	0.23	0.23
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	293	1245		519	1494	668	354	910	401	445	430	365
v/s Ratio Prot	0.03	0.11		c0.06	c0.25		c0.06	0.04		0.02	c0.14	
v/s Ratio Perm	0.11			0.16		0.05	0.13		0.02	0.05		0.03
v/c Ratio	0.32	0.29		0.42	0.59	0.12	0.51	0.15	0.07	0.23	0.62	0.14
Uniform Delay, d1	19.8	25.2		15.4	25.6	20.3	26.4	33.0	32.3	28.4	39.7	35.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4		0.4	1.3	0.3	0.9	0.1	0.1	0.2	3.0	0.2
Delay (s)	20.3	25.7		15.8	26.9	20.5	27.4	33.2	32.4	28.6	42.7	35.4
Level of Service	C	C		B	C	C	C	C	C	C	D	D
Approach Delay (s)		24.7			24.2			30.5			37.5	
Approach LOS		C			C			C			D	

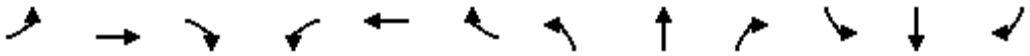
Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Future Volume (vph)	17	1	44	39	1	59	3	320	16	26	590	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	6.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00			1.00	0.98
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.90			0.92			0.99			1.00	0.85
Flt Protected		0.99			0.98			1.00			1.00	1.00
Satd. Flow (prot)		1662			1679			1724			1797	1496
Flt Permitted		0.86			0.89			1.00			0.97	1.00
Satd. Flow (perm)		1448			1522			1719			1754	1496
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	20	1	51	45	1	69	3	372	19	30	686	3
RTOR Reduction (vph)	0	47	0	0	63	0	0	1	0	0	0	1
Lane Group Flow (vph)	0	25	0	0	52	0	0	393	0	0	716	2
Confl. Peds. (#/hr)							1		3	3		1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		7.8			7.8			70.2			70.2	70.2
Effective Green, g (s)		7.8			7.8			70.2			70.2	70.2
Actuated g/C Ratio		0.09			0.09			0.78			0.78	0.78
Clearance Time (s)		6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		125			131			1340			1368	1166
v/s Ratio Prot												
v/s Ratio Perm		0.02			c0.03			0.23			c0.41	0.00
v/c Ratio		0.20			0.40			0.29			0.52	0.00
Uniform Delay, d1		38.2			38.9			2.8			3.7	2.2
Progression Factor		1.00			1.00			1.42			1.00	1.00
Incremental Delay, d2		0.8			2.0			0.6			1.4	0.0
Delay (s)		39.0			40.8			4.6			5.1	2.2
Level of Service		D			D			A			A	A
Approach Delay (s)		39.0			40.8			4.6			5.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

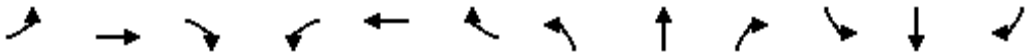
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Future Volume (Veh/h)	4	1	4	3	0	2	4	333	0	2	671	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	1	4	3	0	2	4	354	0	2	714	0
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873			239	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1083	1082	715	1086	1082	355	715			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1013	1012	583	1016	1012	355	583			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	184	203	438	182	203	688	848			1203		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	5	358	716
Volume Left	4	3	4	2
Volume Right	4	2	0	0
cSH	252	257	848	1203
Volume to Capacity	0.04	0.02	0.00	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	19.8	19.3	0.2	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	19.8	19.3	0.2	0.0
Approach LOS	C	C		

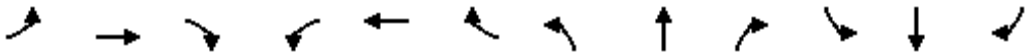
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Future Volume (Veh/h)	1	0	9	3	0	5	4	331	0	1	677	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	0	9	3	0	5	4	348	0	1	713	0
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449			663	
pX, platoon unblocked	0.89	0.89	0.87	0.89	0.89	0.96	0.87			0.96		
vC, conflicting volume	1077	1071	715	1082	1071	349	713			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	917	910	594	923	910	298	592			297		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	99	100	99	100			100		
cM capacity (veh/h)	222	242	437	216	242	709	853			1211		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	8	352	714
Volume Left	1	3	4	1
Volume Right	9	5	0	0
cSH	398	383	853	1211
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	14.3	14.6	0.2	0.0
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	14.6	0.2	0.0
Approach LOS	B	B		

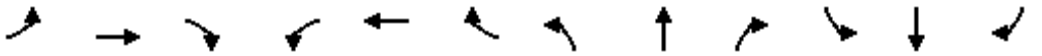
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	4	13	26	2	42	0	275	8	88	574	27
Future Volume (vph)	18	4	13	26	2	42	0	275	8	88	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		0.99		1.00	1.00	0.94		1.00		1.00	1.00	
Flpb, ped/bikes		0.98		0.98	1.00	1.00		1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85		1.00		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1667		1741	1863	1485		1854		1647	1725	
Flt Permitted		0.84		0.73	1.00	1.00		1.00		0.54	1.00	
Satd. Flow (perm)		1432		1343	1863	1485		1854		929	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	4	14	27	2	44	0	286	8	92	598	28
RTOR Reduction (vph)	0	13	0	0	0	41	0	1	0	0	1	0
Lane Group Flow (vph)	0	24	0	27	2	3	0	293	0	92	625	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm		NA		pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4		4				2		
Actuated Green, G (s)		6.3		6.3	6.3	6.3		63.3		73.7	73.7	
Effective Green, g (s)		6.3		6.3	6.3	6.3		63.3		73.7	73.7	
Actuated g/C Ratio		0.07		0.07	0.07	0.07		0.70		0.82	0.82	
Clearance Time (s)		5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		100		94	130	103		1303		803	1412	
v/s Ratio Prot					0.00			0.16		0.01	c0.36	
v/s Ratio Perm		0.02		c0.02		0.00				0.09		
v/c Ratio		0.24		0.29	0.02	0.03		0.22		0.11	0.44	
Uniform Delay, d1		39.6		39.7	39.0	39.0		4.7		1.7	2.3	
Progression Factor		1.00		1.00	1.00	1.00		0.47		0.94	0.89	
Incremental Delay, d2		1.2		1.7	0.0	0.1		0.4		0.1	0.9	
Delay (s)		40.8		41.4	39.0	39.1		2.6		1.7	3.0	
Level of Service		D		D	D	D		A		A	A	
Approach Delay (s)		40.8			40.0			2.6			2.8	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

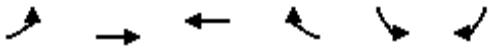
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Future Volume (vph)	80	292	194	95	539	59	261	200	69	136	339	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	311	206	101	573	63	278	213	73	145	361	122
RTOR Reduction (vph)	0	0	182	0	0	53	0	0	36	0	0	56
Lane Group Flow (vph)	85	311	24	101	573	10	278	213	37	145	361	66
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.3	21.4	21.4	21.2	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Effective Green, g (s)	14.3	21.4	21.4	21.2	28.3	28.3	36.1	90.3	90.3	21.1	75.3	75.3
Actuated g/C Ratio	0.08	0.12	0.12	0.12	0.16	0.16	0.20	0.50	0.50	0.12	0.42	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	135	584	182	201	772	240	331	872	784	200	753	631
v/s Ratio Prot	c0.05	0.06		0.06	c0.12		c0.17	0.12		0.08	c0.20	
v/s Ratio Perm			0.02			0.01			0.02			0.04
v/c Ratio	0.63	0.53	0.13	0.50	0.74	0.04	0.84	0.24	0.05	0.72	0.48	0.10
Uniform Delay, d1	80.3	74.6	71.0	74.5	72.4	64.3	69.2	25.5	22.9	76.7	38.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.92	1.03
Incremental Delay, d2	9.3	1.7	0.7	2.3	4.6	0.1	17.2	0.7	0.1	11.9	2.0	0.3
Delay (s)	89.6	76.3	71.7	76.8	77.0	64.5	86.4	26.1	23.0	85.2	37.2	33.0
Level of Service	F	E	E	E	E	E	F	C	C	F	D	C
Approach Delay (s)		76.6			75.9			55.4			47.4	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	64.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

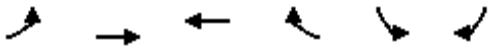
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	622	832	76	0	101
Future Volume (Veh/h)	46	622	832	76	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	655	876	80	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	876				1230	332
vC1, stage 1 conf vol					916	
vC2, stage 2 conf vol					314	
vCu, unblocked vol	466				860	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	89
cM capacity (veh/h)	981				377	974

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	48	218	218	218	350	350	255	106
Volume Left	48	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	80	106
cSH	981	1700	1700	1700	1700	1700	1700	974
Volume to Capacity	0.05	0.13	0.13	0.13	0.21	0.21	0.15	0.11
Queue Length 95th (ft)	4	0	0	0	0	0	0	9
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A							A
Approach Delay (s)	0.6				0.0			9.1
Approach LOS								A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	497	512	10	0	12
Future Volume (Veh/h)	0	497	512	10	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	540	557	11	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	568				737	278
vC1, stage 1 conf vol					557	
vC2, stage 2 conf vol					180	
vCu, unblocked vol	568				737	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1000				444	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	180	180	180	278	278	11	13
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	11	13
cSH	1700	1700	1700	1700	1700	1700	719
Volume to Capacity	0.11	0.11	0.11	0.16	0.16	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	L	T
Maximum Queue (ft)	97	173	151	207	325	301	73	162	87	92	129	273
Average Queue (ft)	37	81	40	72	155	132	2	76	31	40	44	155
95th Queue (ft)	77	149	104	149	262	242	51	142	67	82	92	248
Link Distance (ft)		1828	1828		374	374			359	359		1209
Upstream Blk Time (%)					0	0	0					
Queuing Penalty (veh)					0	0	0					
Storage Bay Dist (ft)	325			325			350	250			350	
Storage Blk Time (%)					0	0	0					0
Queuing Penalty (veh)					1	0	0					0

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB
Directions Served	R
Maximum Queue (ft)	74
Average Queue (ft)	2
95th Queue (ft)	52
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	350
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	76	144	162	259	4
Average Queue (ft)	29	62	47	82	0
95th Queue (ft)	59	123	120	211	3
Link Distance (ft)	304	136	169	537	
Upstream Blk Time (%)		1	0		
Queuing Penalty (veh)		0	1		
Storage Bay Dist (ft)				300	
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	41	30	74	42
Average Queue (ft)	9	6	5	1
95th Queue (ft)	33	25	38	17
Link Distance (ft)	874	707	366	169
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	30	79	15
Average Queue (ft)	8	6	4	0
95th Queue (ft)	30	26	34	11
Link Distance (ft)	837	676	368	366
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	SB	SB
Directions Served	LTR	L	T	R	TR	L	TR
Maximum Queue (ft)	74	60	28	71	129	97	184
Average Queue (ft)	27	20	2	26	26	25	60
95th Queue (ft)	60	49	14	55	80	63	155
Link Distance (ft)	184		820		325		368
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		100		100		150	
Storage Blk Time (%)				0			1
Queuing Penalty (veh)				0			1

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	T	R	L	T	T	T	L	T	L
Maximum Queue (ft)	166	147	145	104	40	147	201	198	152	390	255	259
Average Queue (ft)	59	79	69	33	5	43	107	98	63	205	97	127
95th Queue (ft)	135	132	126	87	22	110	183	176	132	338	196	226
Link Distance (ft)		816	816	816			1580	1580	1580	1688	1688	187
Upstream Blk Time (%)												6
Queuing Penalty (veh)												17
Storage Bay Dist (ft)	600				475	400						
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	281	187
Average Queue (ft)	200	58
95th Queue (ft)	304	200
Link Distance (ft)	187	
Upstream Blk Time (%)	14	0
Queuing Penalty (veh)	41	0
Storage Bay Dist (ft)		200
Storage Blk Time (%)	14	0
Queuing Penalty (veh)	16	1

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	WB
Directions Served	L	TR
Maximum Queue (ft)	69	49
Average Queue (ft)	18	4
95th Queue (ft)	48	24
Link Distance (ft)		816
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

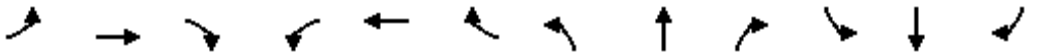
Movement	SB
Directions Served	R
Maximum Queue (ft)	32
Average Queue (ft)	11
95th Queue (ft)	34
Link Distance (ft)	912
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Jumpers Hole Rd

Movement	NB	SB	SB
Directions Served	TR	L	T
Maximum Queue (ft)	61	35	294
Average Queue (ft)	15	5	48
95th Queue (ft)	41	25	188
Link Distance (ft)	187	325	325
Upstream Blk Time (%)			0
Queuing Penalty (veh)			1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

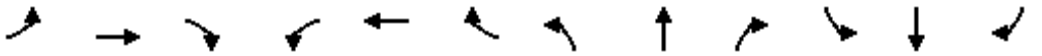
Network Summary

Network wide Queuing Penalty: 78



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Future Volume (vph)	214	679	321	235	458	152	164	367	404	181	255	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3369		1770	3539	1583	1770	3539	1562	1769	1863	1583
Flt Permitted	0.48	1.00		0.10	1.00	1.00	0.31	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	889	3369		188	3539	1583	575	3539	1562	587	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	221	700	331	242	472	157	169	378	416	187	263	198
RTOR Reduction (vph)	0	25	0	0	0	86	0	0	333	0	0	156
Lane Group Flow (vph)	221	1006	0	242	472	71	169	378	83	187	263	42
Confl. Peds. (#/hr)									1	1		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	64.4	50.8		76.9	58.3	58.3	39.5	25.2	25.2	42.9	26.9	26.9
Effective Green, g (s)	66.4	53.8		77.9	61.3	61.3	41.5	27.2	27.2	44.9	28.9	28.9
Actuated g/C Ratio	0.49	0.40		0.57	0.45	0.45	0.30	0.20	0.20	0.33	0.21	0.21
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	6.5		2.5	6.5	6.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	528	1331		364	1593	712	309	707	312	341	395	336
v/s Ratio Prot	0.04	c0.30		c0.11	0.13		0.06	0.11		c0.07	c0.14	
v/s Ratio Perm	0.16			0.27		0.04	0.11		0.05	0.11		0.03
v/c Ratio	0.42	0.76		0.66	0.30	0.10	0.55	0.53	0.27	0.55	0.67	0.13
Uniform Delay, d1	20.4	35.5		28.9	23.7	21.5	37.0	48.8	46.0	34.7	49.2	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.4		4.1	0.3	0.2	1.6	1.0	0.6	1.4	4.6	0.2
Delay (s)	20.8	38.9		32.9	24.1	21.7	38.6	49.8	46.6	36.2	53.8	43.6
Level of Service	C	D		C	C	C	D	D	D	D	D	D
Approach Delay (s)		35.7			26.1			46.5			45.6	
Approach LOS		D			C			D			D	

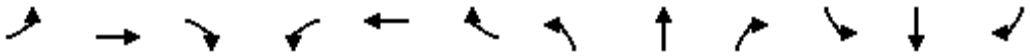
Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Future Volume (vph)	16	1	27	21	2	67	13	852	52	62	730	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	6.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00			1.00	0.98
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.92			0.90			0.99			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1676			1657			1721			1793	1496
Flt Permitted		0.87			0.91			0.99			0.87	1.00
Satd. Flow (perm)		1486			1517			1701			1571	1496
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	1	28	22	2	69	13	878	54	64	753	20
RTOR Reduction (vph)	0	26	0	0	64	0	0	1	0	0	0	4
Lane Group Flow (vph)	0	19	0	0	29	0	0	944	0	0	817	16
Confl. Peds. (#/hr)							1		3	3		1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		6.5			6.5			71.5			71.5	71.5
Effective Green, g (s)		6.5			6.5			71.5			71.5	71.5
Actuated g/C Ratio		0.07			0.07			0.79			0.79	0.79
Clearance Time (s)		6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		107			109			1351			1248	1188
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.02			c0.55			0.52	0.01
v/c Ratio		0.18			0.27			0.70			0.65	0.01
Uniform Delay, d1		39.2			39.5			4.3			4.0	1.9
Progression Factor		1.00			1.00			1.35			1.00	1.00
Incremental Delay, d2		0.8			1.3			2.3			2.7	0.0
Delay (s)		40.0			40.8			8.1			6.6	1.9
Level of Service		D			D			A			A	A
Approach Delay (s)		40.0			40.8			8.1			6.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

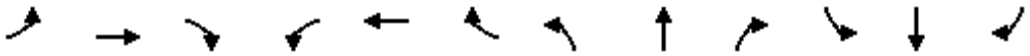
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Future Volume (Veh/h)	2	0	0	4	0	6	4	909	4	5	770	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	0	0	4	0	6	4	947	4	5	802	3
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								873			239	
pX, platoon unblocked	0.74	0.74	0.82	0.74	0.74	0.65	0.82			0.65		
vC, conflicting volume	1778	1774	804	1772	1774	950	806			952		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1328	1324	652	1319	1323	655	654			658		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	96	100	98	99			99		
cM capacity (veh/h)	95	114	383	98	114	303	764			605		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	10	955	810
Volume Left	2	4	4	5
Volume Right	0	6	4	3
cSH	95	165	764	605
Volume to Capacity	0.02	0.06	0.01	0.01
Queue Length 95th (ft)	2	5	0	1
Control Delay (s)	43.8	28.2	0.2	0.2
Lane LOS	E	D	A	A
Approach Delay (s)	43.8	28.2	0.2	0.2
Approach LOS	E	D		

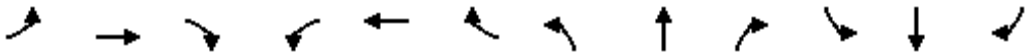
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Future Volume (Veh/h)	2	0	6	3	0	2	6	913	8	6	767	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2	0	6	3	0	2	6	941	8	6	791	1
Pedestrians								2			1	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								449			663	
pX, platoon unblocked	0.76	0.76	0.82	0.76	0.76	0.67	0.82			0.67		
vC, conflicting volume	1764	1764	794	1768	1761	946	792			949		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1308	1309	637	1315	1305	667	635			672		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	97	100	99	99			99		
cM capacity (veh/h)	101	118	390	99	119	305	776			611		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	5	955	798
Volume Left	2	3	6	6
Volume Right	6	2	8	1
cSH	227	136	776	611
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	1	1
Control Delay (s)	21.4	32.6	0.2	0.3
Lane LOS	C	D	A	A
Approach Delay (s)	21.4	32.6	0.2	0.3
Approach LOS	C	D		

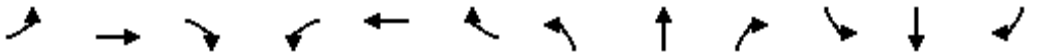
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	29	79	10	136	0	767	31	181	558	37
Future Volume (vph)	24	8	29	79	10	136	0	767	31	181	558	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		0.99		1.00	1.00	0.95		1.00		1.00	1.00	
Flpb, ped/bikes		0.99		0.99	1.00	1.00		1.00		1.00	1.00	
Frt		0.93		1.00	1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1673		1754	1863	1512		1851		1652	1720	
Flt Permitted		0.88		0.82	1.00	1.00		1.00		0.18	1.00	
Satd. Flow (perm)		1495		1506	1863	1512		1851		318	1720	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	8	30	81	10	139	0	783	32	185	569	38
RTOR Reduction (vph)	0	27	0	0	0	123	0	1	0	0	2	0
Lane Group Flow (vph)	0	36	0	81	10	16	0	814	0	185	605	0
Confl. Peds. (#/hr)	6		4	4		6	3		4	4		3
Turn Type	Perm	NA		Perm	NA	Perm		NA		pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4		4				2		
Actuated Green, G (s)		10.5		10.5	10.5	10.5		54.7		69.5	69.5	
Effective Green, g (s)		10.5		10.5	10.5	10.5		54.7		69.5	69.5	
Actuated g/C Ratio		0.12		0.12	0.12	0.12		0.61		0.77	0.77	
Clearance Time (s)		5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		174		175	217	176		1124		390	1328	
v/s Ratio Prot					0.01			c0.44		0.05	c0.35	
v/s Ratio Perm		0.02		c0.05		0.01				0.31		
v/c Ratio		0.20		0.46	0.05	0.09		0.72		0.47	0.46	
Uniform Delay, d1		36.0		37.1	35.3	35.5		12.4		9.4	3.6	
Progression Factor		1.00		1.00	1.00	1.00		0.49		2.00	1.10	
Incremental Delay, d2		0.6		1.9	0.1	0.2		3.4		0.7	0.9	
Delay (s)		36.6		39.1	35.4	35.7		9.5		19.5	4.9	
Level of Service		D		D	D	D		A		B	A	
Approach Delay (s)		36.6			36.9			9.5			8.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

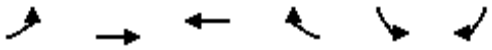
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Future Volume (vph)	353	695	374	180	547	168	356	316	96	147	304	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	10	12	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	4916	1531	1711	4916	1531	1652	1739	1563	1711	1801	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	360	709	382	184	558	171	363	322	98	150	310	132
RTOR Reduction (vph)	0	0	303	0	0	147	0	0	62	0	0	99
Lane Group Flow (vph)	360	709	79	184	558	24	363	322	36	150	310	33
Confl. Peds. (#/hr)							1		1	1		1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	40.8	37.1	37.1	29.4	25.7	25.7	42.2	65.9	65.9	21.6	45.3	45.3
Effective Green, g (s)	40.8	37.1	37.1	29.4	25.7	25.7	42.2	65.9	65.9	21.6	45.3	45.3
Actuated g/C Ratio	0.23	0.21	0.21	0.16	0.14	0.14	0.23	0.37	0.37	0.12	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	387	1013	315	279	701	218	387	636	572	205	453	380
v/s Ratio Prot	c0.21	c0.14		0.11	0.11		c0.22	0.19		0.09	c0.17	
v/s Ratio Perm			0.05			0.02			0.02			0.02
v/c Ratio	0.93	0.70	0.25	0.66	0.80	0.11	0.94	0.51	0.06	0.73	0.68	0.09
Uniform Delay, d1	68.2	66.3	59.8	70.6	74.6	67.2	67.6	44.4	37.0	76.4	60.9	51.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22
Incremental Delay, d2	29.1	2.7	0.9	5.8	7.2	0.5	30.4	2.9	0.2	12.2	7.6	0.4
Delay (s)	97.3	69.0	60.7	76.4	81.8	67.7	98.0	47.3	37.2	89.0	68.8	63.4
Level of Service	F	E	E	E	F	E	F	D	D	F	E	E
Approach Delay (s)		73.8			78.0			69.5			72.7	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

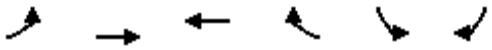
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1496	1033	41	0	71
Future Volume (Veh/h)	53	1496	1033	41	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	55	1542	1065	42	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)			926			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1065				1710	376
vC1, stage 1 conf vol					1086	
vC2, stage 2 conf vol					624	
vCu, unblocked vol	678				1396	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	93
cM capacity (veh/h)	818				248	975

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	55	514	514	514	426	426	255	73
Volume Left	55	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	42	73
cSH	818	1700	1700	1700	1700	1700	1700	975
Volume to Capacity	0.07	0.30	0.30	0.30	0.25	0.25	0.15	0.07
Queue Length 95th (ft)	5	0	0	0	0	0	0	6
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS	A							A
Approach Delay (s)	0.3				0.0			9.0
Approach LOS								A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	938	945	6	0	7
Future Volume (Veh/h)	0	938	945	6	0	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1020	1027	7	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		1	1			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1034				1367	514
vC1, stage 1 conf vol					1027	
vC2, stage 2 conf vol					340	
vCu, unblocked vol	1034				1367	514
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	668				244	506

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	340	340	340	514	514	7	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	7	8
cSH	1700	1700	1700	1700	1700	1700	506
Volume to Capacity	0.20	0.20	0.20	0.30	0.30	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	349	710	742	283	268	247	9	198	220	242	267	268
Average Queue (ft)	146	372	378	130	116	90	0	91	116	123	85	110
95th Queue (ft)	350	787	786	232	207	182	6	175	193	200	237	225
Link Distance (ft)		1828	1828		374	374			362	362		
Upstream Blk Time (%)					0	0						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (ft)	325			325			350	250			250	350
Storage Blk Time (%)	0	14		0	0	0		0	0	0	1	
Queuing Penalty (veh)	0	31		0	0	0		0	0	0	1	

Intersection: 1: Jumpers Hole Rd & MD 177 (Mountain Rd)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	528	150
Average Queue (ft)	212	12
95th Queue (ft)	456	123
Link Distance (ft)	1209	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		350
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	8	0

Intersection: 2: Jumpers Hole Rd & Ashberry Ln/Evening Star Dr

Movement	EB	WB	NB	SB	SB	B21	B22
Directions Served	LTR	LTR	LTR	LT	R	T	T
Maximum Queue (ft)	75	132	185	620	324	422	180
Average Queue (ft)	26	55	137	363	29	101	27
95th Queue (ft)	58	106	241	716	179	395	185
Link Distance (ft)	307	136	170	537		464	362
Upstream Blk Time (%)		1	12	16		6	2
Queuing Penalty (veh)		0	111	133		45	15
Storage Bay Dist (ft)					300		
Storage Blk Time (%)				24	0		
Queuing Penalty (veh)				4	0		

Intersection: 3: Jumpers Hole Rd & Woodholme Circle (N)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	25	51	342	150
Average Queue (ft)	4	11	125	22
95th Queue (ft)	18	37	357	114
Link Distance (ft)	874	707	366	170
Upstream Blk Time (%)			4	2
Queuing Penalty (veh)			37	12
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Jumpers Hole Rd & Woodholme Circle (S)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	39	372	339
Average Queue (ft)	9	7	69	41
95th Queue (ft)	31	29	278	212
Link Distance (ft)	837	676	369	366
Upstream Blk Time (%)			2	2
Queuing Penalty (veh)			20	14
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Jumpers Hole Rd & Walmart Dwy (N)

Movement	EB	WB	WB	WB	NB	SB	SB
Directions Served	LTR	L	T	R	TR	L	TR
Maximum Queue (ft)	111	106	237	122	384	200	421
Average Queue (ft)	44	47	22	60	236	105	159
95th Queue (ft)	93	95	108	106	400	205	376
Link Distance (ft)	183		820		325		369
Upstream Blk Time (%)					7		5
Queuing Penalty (veh)					55		38
Storage Bay Dist (ft)		100		100		150	
Storage Blk Time (%)		2		3		2	10
Queuing Penalty (veh)		3		2		10	18

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	594	719	643	245	141	258	215	201	180	110	518	424
Average Queue (ft)	453	315	283	140	43	118	111	114	84	10	334	216
95th Queue (ft)	688	730	649	236	109	224	185	185	163	54	501	373
Link Distance (ft)		816	816	816			1580	1580	1580		1682	1682
Upstream Blk Time (%)		3	0									
Queuing Penalty (veh)		15	0									
Storage Bay Dist (ft)	600				475	400				750		
Storage Blk Time (%)	14	0										
Queuing Penalty (veh)	33	0										

Intersection: 6: Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	249	282	187
Average Queue (ft)	145	241	93
95th Queue (ft)	245	325	246
Link Distance (ft)	187	187	
Upstream Blk Time (%)	9	35	1
Queuing Penalty (veh)	27	102	0
Storage Bay Dist (ft)			200
Storage Blk Time (%)		35	1
Queuing Penalty (veh)		46	2

Intersection: 7: MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy

Movement	EB	EB	EB	WB
Directions Served	L	T	T	TR
Maximum Queue (ft)	73	113	89	22
Average Queue (ft)	25	16	10	1
95th Queue (ft)	61	109	80	12
Link Distance (ft)		1505	1505	816
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 8: MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	920
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: Bend

Movement	EB	EB
Directions Served	T	
Maximum Queue (ft)	382	420
Average Queue (ft)	114	42
95th Queue (ft)	345	208
Link Distance (ft)	374	374
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	1	4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: Jumpers Hole Rd

Movement	WB	NB	SB	SB
Directions Served	R	TR	L	T
Maximum Queue (ft)	100	186	134	344
Average Queue (ft)	33	78	51	173
95th Queue (ft)	73	160	107	389
Link Distance (ft)	204	187	325	325
Upstream Blk Time (%)		1		6
Queuing Penalty (veh)		12		21
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 822

APPENDIX G: INTERIM OPTIONS PRESENTATION TO THE COMMUNITY

Anne Arundel County
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Making a difference, together

Jumpers Hole Road Planning Study

MD 2 to MD 177

Working Group Meeting

March 2, 2022

Discussion Topics

1. Purpose & Need: Study origin, priority of needs
2. Study timeline and where we are
3. Summary of community comments – previous and recent surveys
4. Concepts, metrics, and high-level results
5. Next steps
6. Questions

1. Purpose & Need

- Study origin – community concerns
  - Neighborhood egress challenges
  - Limited pedestrian/bicycle accessibility
  - Speeding
  - Large trucks

2. Study Timeline

Summer 2021	Fall 2021	Winter 2021	Winter 2022	Spring 2022
Survey / Purpose & Need	Data Collection	Develop & Test Alternative Designs	Results and Community Feedback	Finalize Recommendations & Study
■ Goals ■ Priorities	■ Speed ■ Volume ■ Class ■ Crash data ■ Field Observations	■ New Traffic Control ■ Revised Traffic Control ■ New roadway connections ■ Sidewalks, bike lanes, shared-use paths	■ Define Metrics ■ Discuss Analysis w/ Community	Develop opportunities to implement recommendations ■ CIP ■ Minor projects

3. Summary of Prior Comments (January 2018)

- Lack of pedestrian facilities & connectivity
- Difficulty exiting from side streets
- Desire for signal at Evening Star / Ashberry
- Lack of bike facilities along corridor
- Speeding
- Need left-turn lane onto Evening Star from southbound JHR
- Property impact concerns associated with potential improvements

3. New Survey Results (summer 2021)

- Most notable concerns (in order of prevalence)
  1. Cannot get out of neighborhood
  2. Unsafe to walk or bike to shopping
  3. Speeding
  4. Too many cars
  5. Too many trucks
  6. Cars running off road onto my property
- When is it most difficult to turn out of your neighborhood?
  - Morning (27%)
  - Mid-day (15%)
  - Evening (36%)
  - All-day (75%)

3. New Survey Results (summer 2021)

- Desired vehicular traffic improvements (in order of prevalence)
  1. Traffic signal at Evening Star Drive
  2. Traffic calming
  3. New roadway connections to/from Woodholme Circle
  4. Restrict through-trucks
  5. Reduce speed limits
  6. Restrict left turns from Woodholme Circle
- Desired pedestrian/bike improvements (in order of prevalence)
  1. Sidewalk on both sides of roadway
  2. Shared use path
  3. Sidewalk on one side of roadway
  4. On-road bike lanes

4. Goals for Tested Alternatives

- Improve egress from side streets
- Improve pedestrian and bicycle mobility and accessibility
- Manage traffic volumes and speeds
- No additional through lanes on Jumpers Hole Road
- Minimize right-of-way impacts

4. Ideas Under Consideration

Operational	Capital
Speed management	Speed management
Turn prohibitions	New signal(s)
All-way stop control	New roundabout(s)
Through-truck prohibition	New road connections
Bike lanes	Sidewalks, shared-use paths

4. Performance Metrics

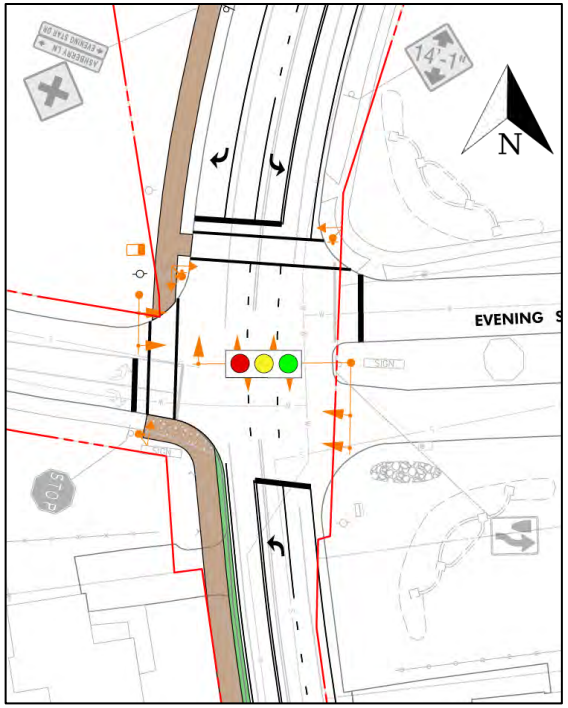
- Right-of-way needs
- Utilities relocations anticipated
- Expected speed reduction
- Expected new gaps in JHR traffic for side street access
- Change in travel time through corridor
- Changes in delays and queues
- Improved pedestrian and bike connectivity (qualitative)
- Planning-level construction costs

4. High-Level Results

Element	Create Gaps?	Reduce Speeding?	Biking Access?	Walking Access?	Discourage Traffic?
All-way Stop	+ / -	+		+	+
Traffic Signal	+	+		+	+
Roundabout	+	+			+
New Road Connections	+	-			-
Sidewalk / Path		+	+	+	
Bike Lanes		+	+		+
Truck Prohibitions					+

4.1 Signal at Evening Star

- Coordinate with signals at Walmart and at MD 2 to create gaps

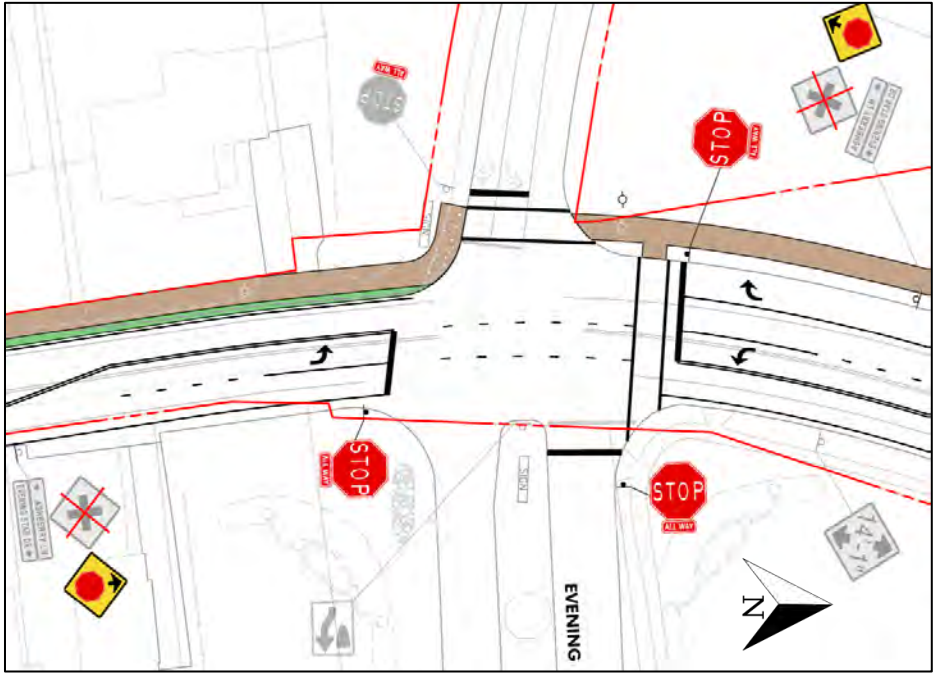


4.1 Signal at Evening Star

- No additional right-of-way needed
- No utilities impacted
- New gaps in JHR traffic would be available
- Corridor travel time increases up to 30 seconds
- New protected pedestrian crossing at Evening Star

4.2 All-Way Stop at Evening Star

- Optional left-turn bays
  - Limits sidewalk potential within ROW
- Provides for controlled pedestrian crossings

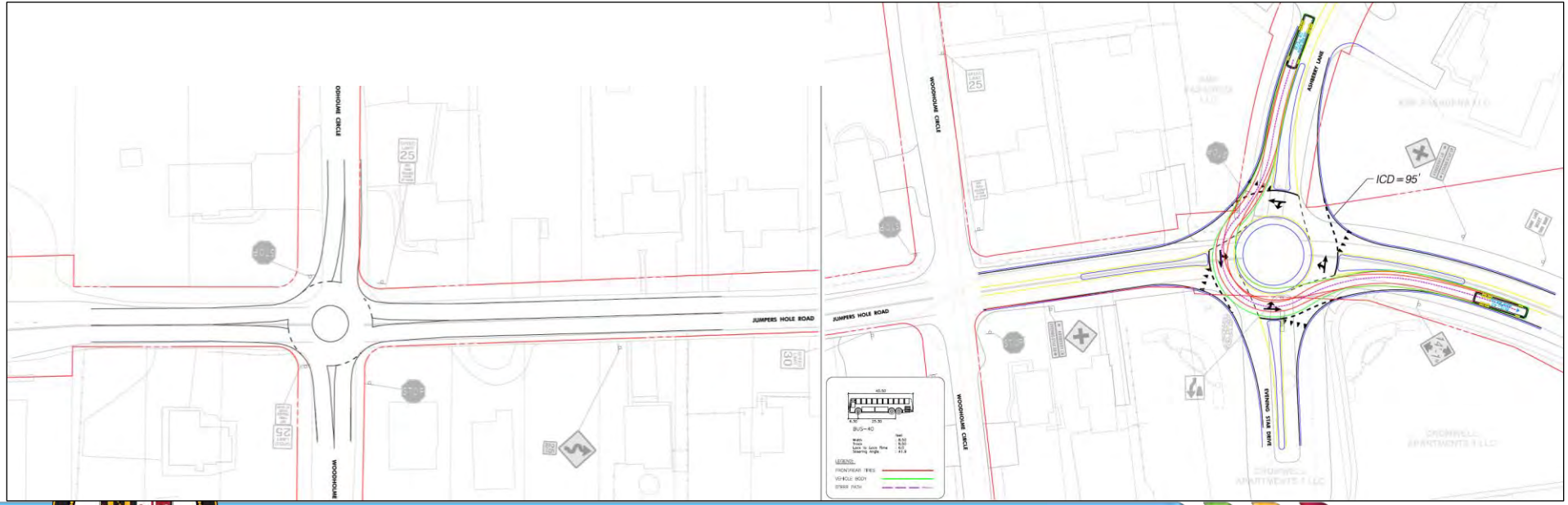


4.2 All-way Stop Sign at Evening Star

- No right-of-way needed
- No utilities impacted
- No new gaps created at Woodholme (N and S)
- Increased delays and queuing along JHR
- Pedestrian crossing at Evening Star becomes controlled

4.3 Roundabouts

- Roundabout at Evening Star
- Mini-roundabout at Woodholme (S)

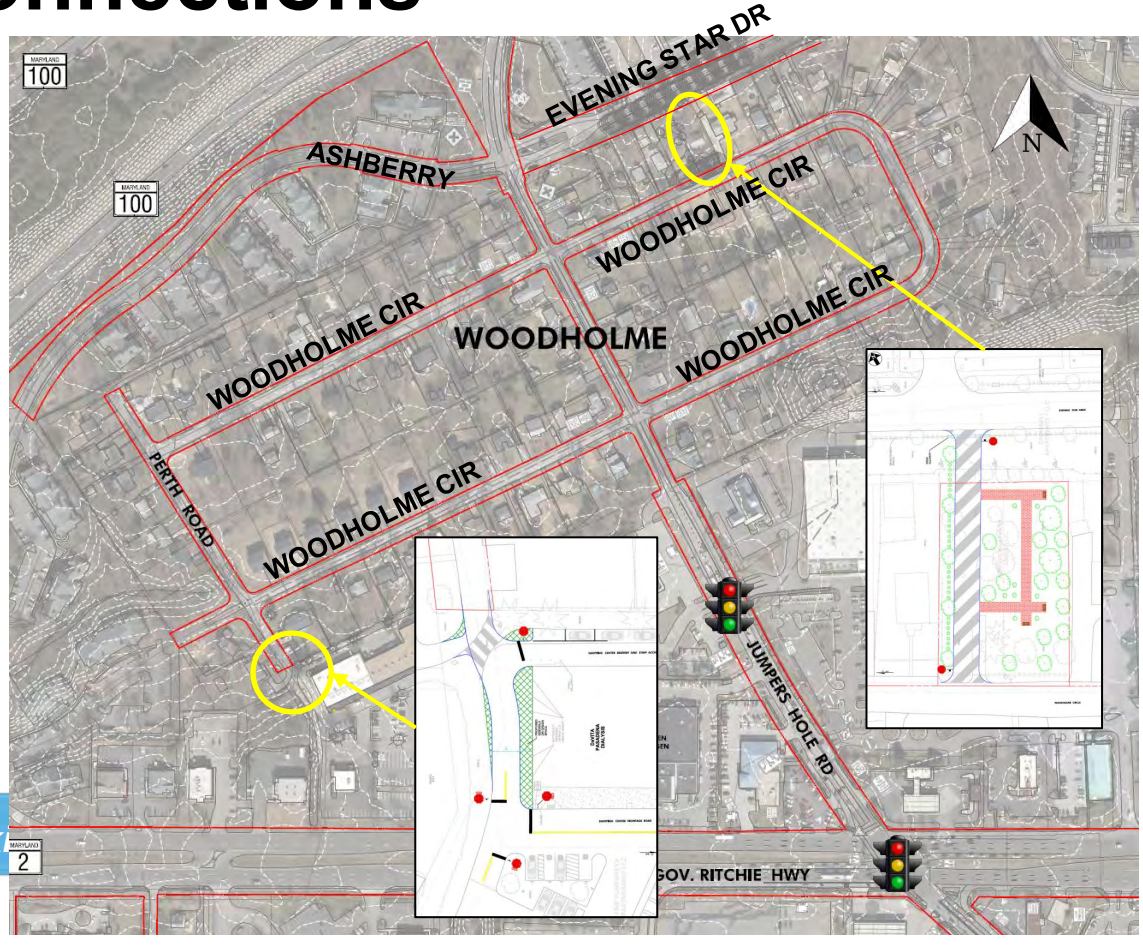


4.3 Roundabouts

- Minor right-of-way impacts
- Major overhead utility relocations needed
- New gaps expected in JHR traffic
- Minimal change in corridor travel time
- Reductions in speed and conflict points

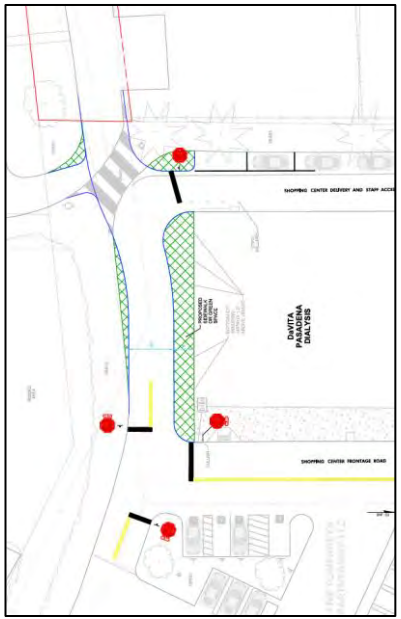
4.4 New Road Connections

- Extend Perth Road to Patriots Plaza parking lot
- Connect Evening Star with Woodholme Cir (N)



4.4 New Road Connections

- HOA and private right-of-way impacts
- Minor utility impacts
- Minimal improvement in travel times
- No improvements to pedestrian and bike infrastructure connectivity

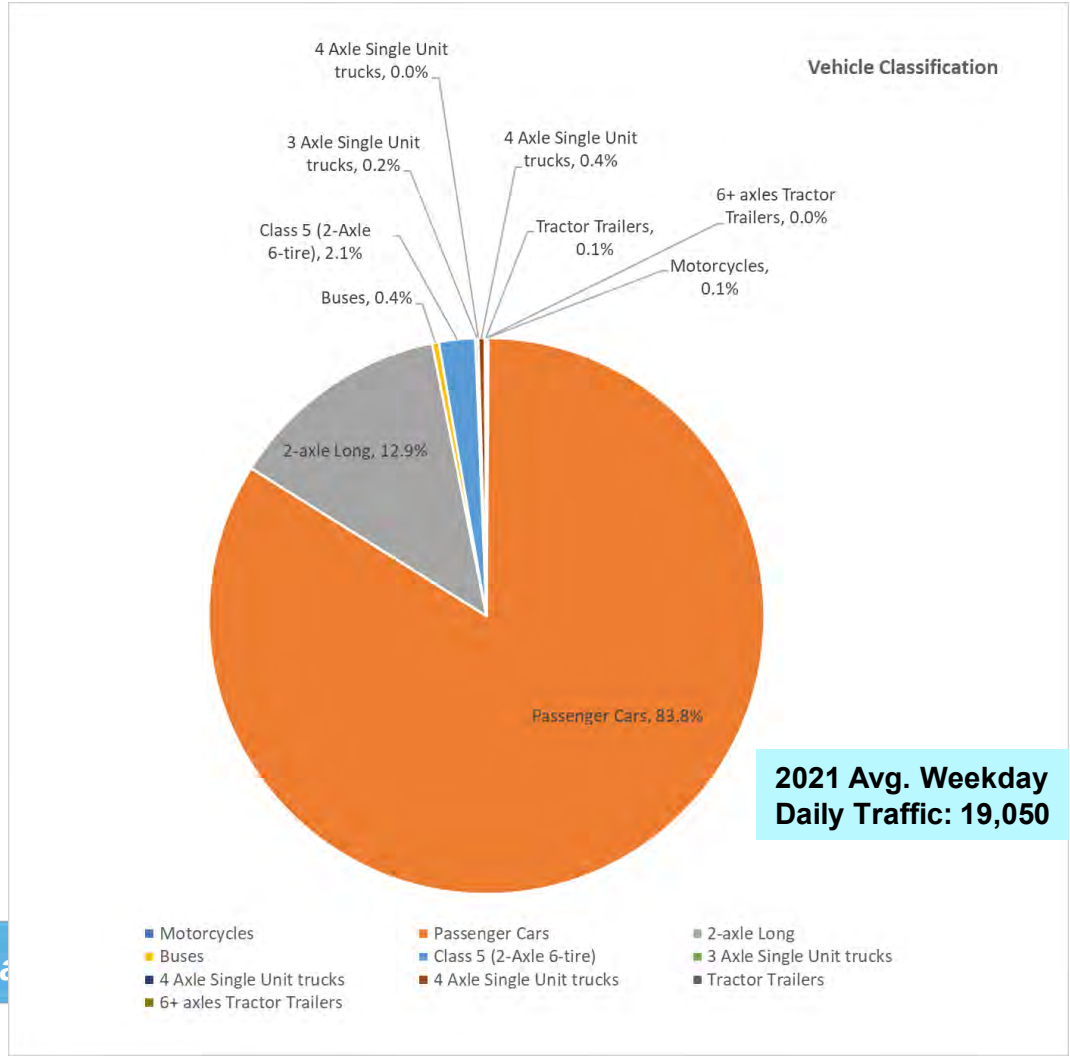


4.5 Bike/Pedestrian Improvements

- Short-Term
  - Mark/sign existing shoulders to bike lanes
  - 4’ shoulder through Woodholme would be substandard – full reconstruction needed to widen
- Long-Term
  - Path along west side of JHR through neighborhood
  - Consider sidewalk on east side through Woodholme by removing existing shoulders
  - Sidewalk under MD 100
    - Consider raising shoulder on at least one side

4.6 Truck Prohibitions

- 99.5% of all vehicles are box trucks or smaller – minimal impact anticipated



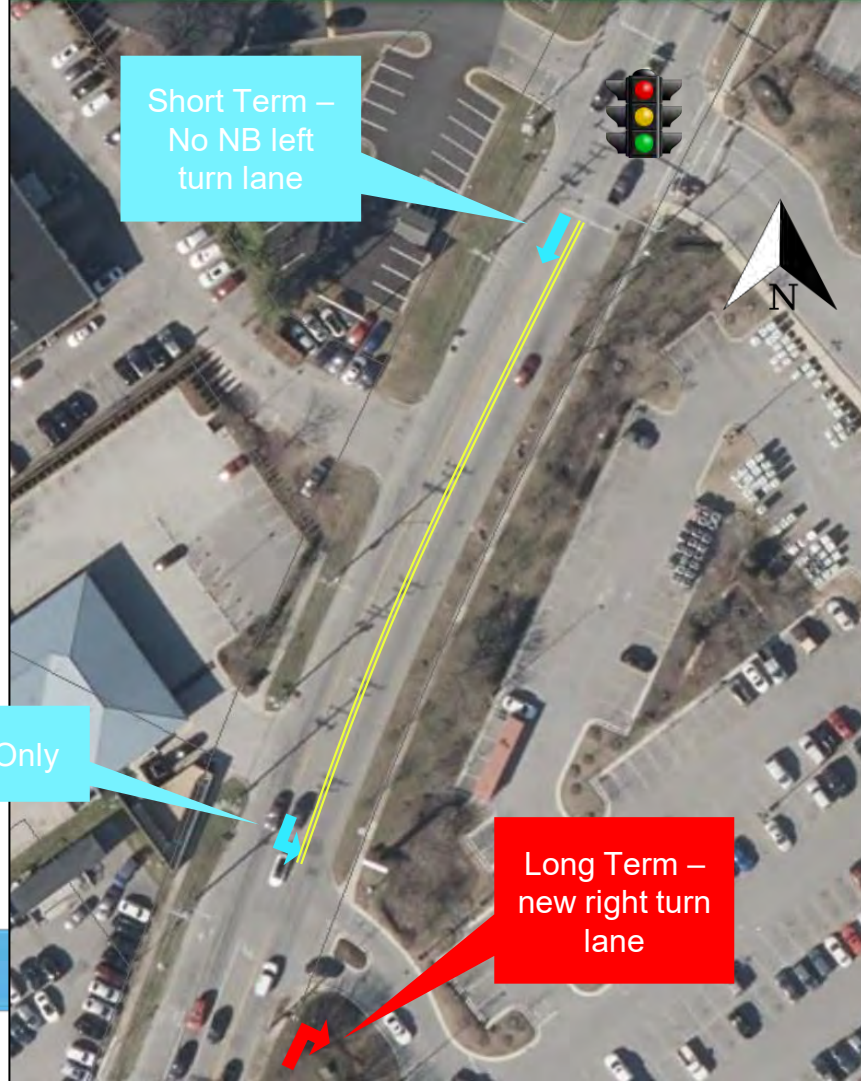
2021 Avg. Weekday Daily Traffic: 19,050

4.7 Other Traffic Improvement Options

- Short-Term
  - Add signalized crossing at Walmart signal
  - Provide NB and SB left-turn lanes at Evening Star
  - Change NB left-turn lane at Walmart to SB through lane
    - Improves Walmart egress
- Long-Term
  - Modify unsignalized Walmart driveway
    - Alt 1: New NB right-turn lane into driveway
    - Alt 2: Prohibit SB left turns into driveway
  - General MD 2 at JHR intersection capacity improvements

4.7 Short-Term Option – Lane Use Changes at Walmart

- Change NB left-turn lane at Walmart to SB through lane
- New SB left-turn lane at unsignalized Walmart driveway



4.8 Recommendations

- Short-Term
  - Install signal at Evening Star
    - Provide NB & SB left-turn lanes
    - Provide signalized pedestrian crossing
    - Coordinate timing with Walmart signal to create gaps along JHR
  - Provide signalized crossing at Walmart signal
  - Change NB left-turn lane at Walmart signal to SB through lane
- Long-Term
  - Install path along west side
  - Create new right-turn lane to unsignalized Walmart driveway
  - Prohibit SB left turns into unsignalized Walmart driveway

5. Next Steps

- Refine recommendations based on community feedback
  - Which options would you like to prioritize?
- Select preferred short-term and long-term concept(s)
- Complete study with recommendations for next design phase

6. Questions?

- Thank you!
- Project contact information
  - Project Manager – Adam Greenstein, PE, PTOE
  - adam.greenstein@aacounty.org
  - 443-569-9587

Bureau of Utility Operations

24-Hour Emergency
Water Service: (410) 222-8400
Billing Inquiries: (410) 222-1144

Bureau of Waste Management Services

Bulk Trash Service / Curbside Collections: (410) 222-6100

Bureau of Highways

General Inquiries: (410) 222-7321
Snow Line: (410) 222-4040
Email: hwyscustomercare@aacounty.org

Bureau of Engineering

General Inquiries: (410) 222-7500

Bureau of Watershed Protection and Restoration

General Inquiries: (410) 222-1072

Customer Relations:
(410) 222-7582

APPENDIX H: FINAL RECOMMENDATION PRESENTATION TO THE COMMUNITY

Anne Arundel County
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Jumpers Hole Road Planning Study

MD 2 to MD 177

Public Meeting

May 23, 2022

Agenda

1. Purpose & Need: Study origin, priority of needs
2. Study timeline and where we are
3. Recap: Ideas evaluated, metrics incorporated
4. Recap: Recommendations from previous meetings
5. Refined recommendations
    1. Highlights
    2. Additional options
6. Questions and feedback

1. Purpose & Need

- Study origin – community concerns
  - Neighborhood egress challenges
  - Limited pedestrian/bicycle accessibility
  - Speeding
  - Large trucks

2. Study Timeline

Summer 2021

Survey / Purpose & Need

- Goals
- Priorities

Fall 2021

Data Collection

- Speed
- Volume, class
- Crashes

Winter 2021

Develop & Test Alternative Designs

- Traffic control
- Road connections
- Pedestrian & bicycle facilities

Winter 2022

Results and Community Feedback

- Define metrics
- Discuss analysis w/ community leaders

Spring 2022

Finalize Recommendations

Plan for Implementation

- CIP
- Minor projects

3. Ideas Evaluated

Operational	Capital
Speed management	Speed management
Turn prohibitions	New signal(s)
All-way stop control	New roundabout(s)
Through-truck prohibition	New road connections
Bike lanes	Sidewalks, shared-use paths

3. Metrics Evaluated

- Right-of-way needs
- Utility impacts
- Expected speed reductions
- Expected new gaps in JHR traffic for side street access
- Changes in travel time through corridor
- Changes in delays and queues
- Improved pedestrian and bike connectivity
- Planning-level construction costs

4. Recommendations from Prior Meeting

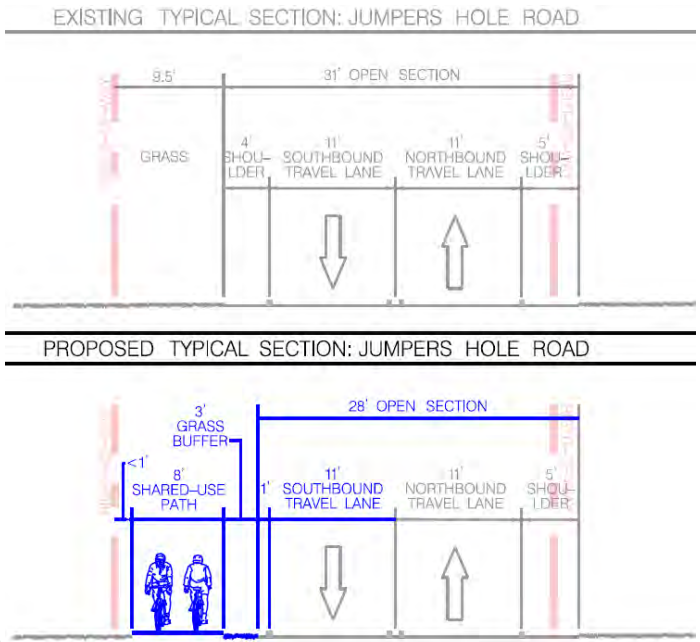
- Short-Term
  - Signal at Evening Star Drive
    - NB & SB left-turn lanes
    - Signalized pedestrian crossing
    - Coordinate timing with Walmart signal – create gaps along JHR
  - Signalized pedestrian crossing at Walmart
  - Consider changing NB left-turn lane at Walmart signal to SB through lane
- Long-Term
  - Shared-use path on west side
  - Consider new NB right-turn lane to unsignalized Walmart driveway
  - Consider prohibiting SB left turns to unsignalized Walmart driveway

5. Updated Recommendations: Two Options

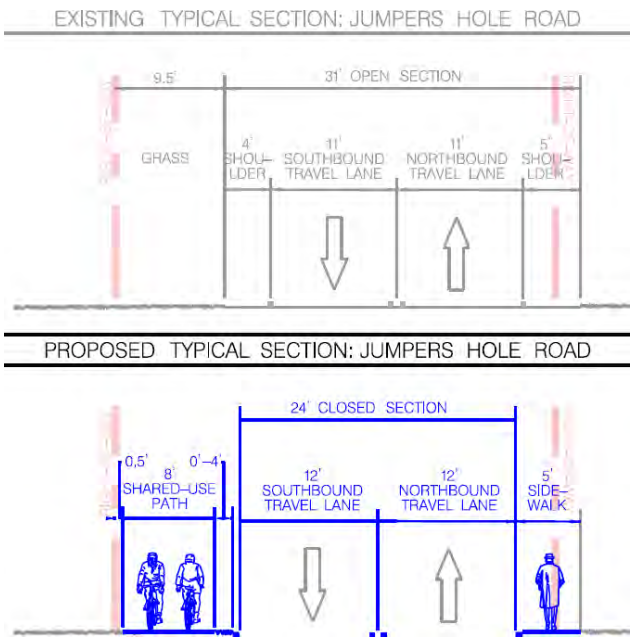
- Overlapping elements – both options include:
  - Signal at Evening Star Drive w/left-turn lanes
  - Shared-use path on west side of JHR
  - Remove SB right-turn lane at Ashberry Lane
  - Signalized pedestrian crossings at MD 177
  - Designated pedestrian crossings at Woodholme Cir
  - Signalized pedestrian crossing at Walmart
  - Connect sidewalk south of Walmart to Animal Hospital
- Can also consider sidewalk on east side of JHR (easement required)
- Design/construction can be phased, if needed

5. Cross Sections through Woodholme

OPTION 1

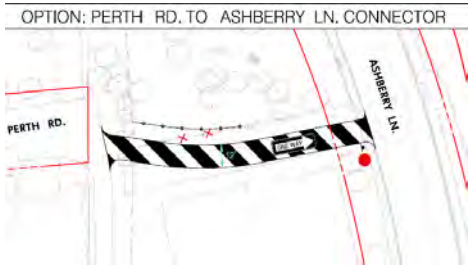


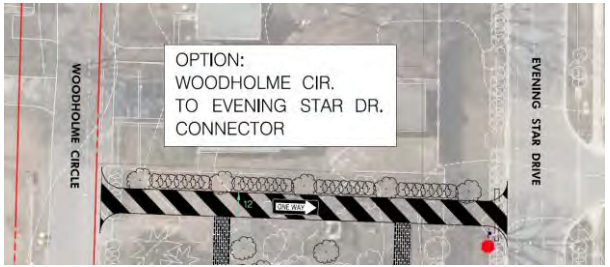
OPTION 2



5. Optional Elements

- New roadway connections from Woodholme to Evening Star / Ashberry
  - One-way outbound
  - Direct access to proposed signal

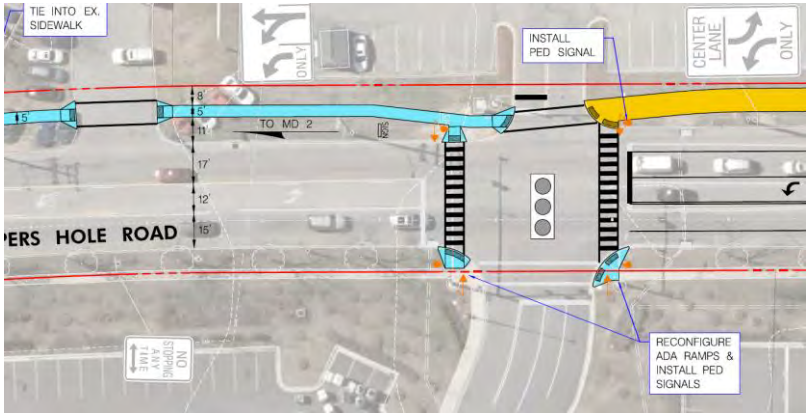


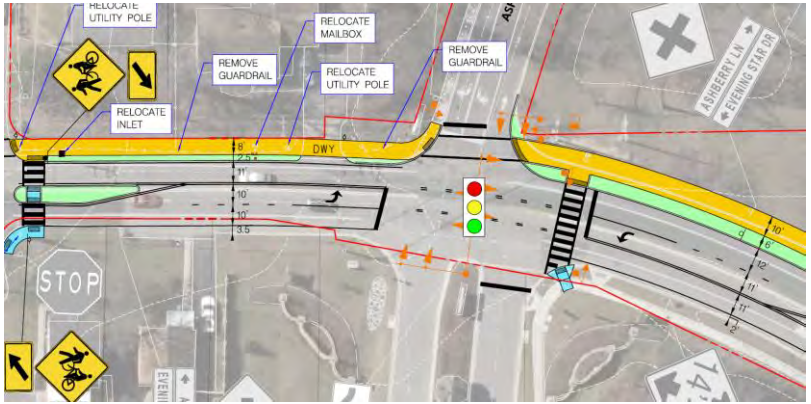


- Congestion improvements
  - Short-term: Restripe NB left-turn lane at Walmart signal as SB receiving lane
  - Long-term: Intersection improvements at Walmart driveway entrance

Option 1 – Highlights

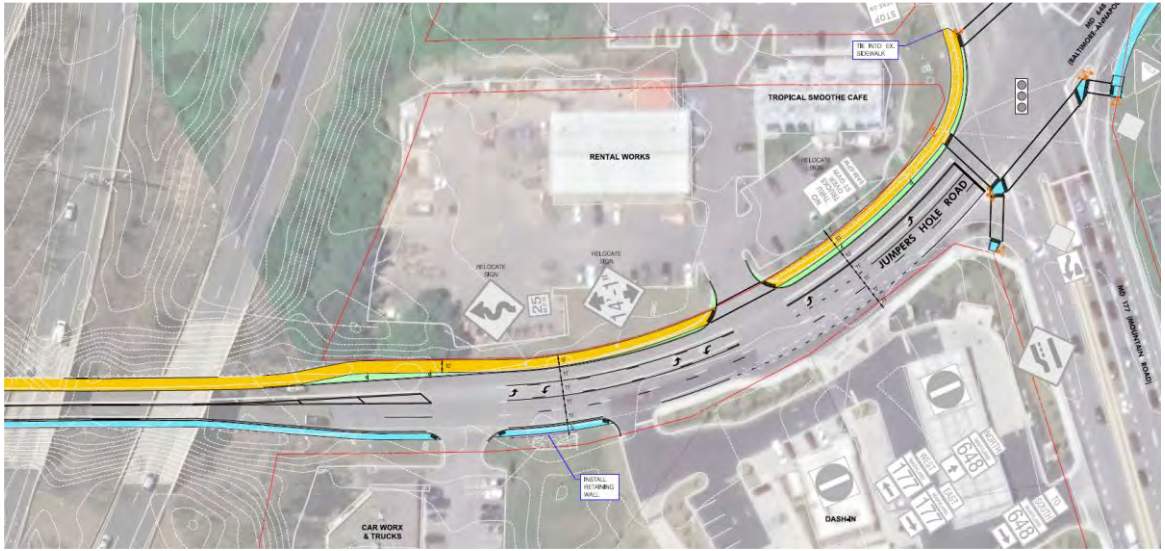
- Improved pedestrian/bicycle facilities
- Designated pedestrian crossings
- Access improvements
- Left-turn lanes
- New signal at Evening Star / Ashberry





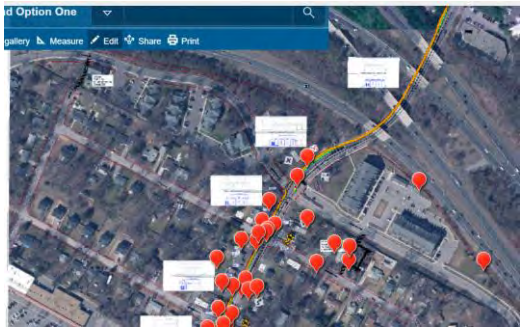
Option 2 – Highlights

- Improvements from Option 1
- Add continuous sidewalk to MD 177



6. We Want Your Feedback

- Please provide comments online directly on concept plans – link on webpage
- Zoom in and pan like on typical online map
- Click on specific location to provide comments
  - Option to add your contact information



ZOOM IN

6. Questions?

- Thank you!
- Project contact information:

  Project Manager – Adam Greenstein, PE, PTOE
  adam.greenstein@aacounty.org
  443-569-9587

Bureau of Utility Operations

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Bureau of Engineering

General Inquiries: (410) 222-7500

Bureau of Watershed Protection and Restoration

General Inquiries: (410) 222-1072

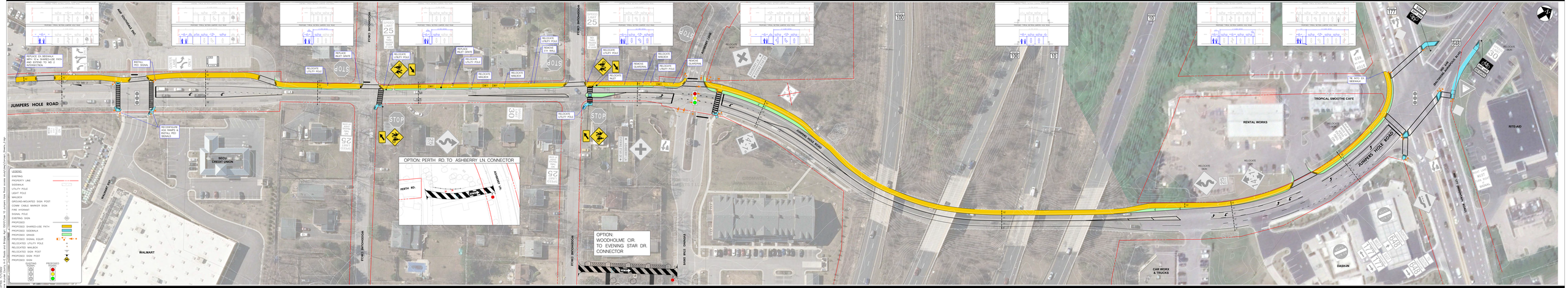
Customer Relations:
(410) 222-7582

APPENDIX I: ONLINE PUBLIC COMMENT SUMMARY

Summary of Online map-based comments

Comment	Option 1	Option 2
Intersection of MD 177 at Jumpers Hole Road		
1	Consider eliminating this entrance/exit to Shell as it is too close to the intersection.	Please add bike queuing area so that they can be in a safe place to transition from the bike gutter to the SUP on the other side of the intersection.
2	Consider expanding the island to provide a safe haven for users or eliminate it and force drivers to stop and look for pedestrians by accentuating the angle of the turn and eliminating Right Turn on Red.	Consider adding a signal to ensure safe passage between island and sidewalk. Possibly stopping right turning vehicles for this transition.
3	Please don't end a SUP abruptly with no safe place to go. Ensure this is connected in a way that users can get to a safe haven.	Please ensure the SUP is accessible to bikes that are coming from RT-648's bike gutter. Consider also adding bicycle signal to intersection to allow vulnerable road users to establish themselves and their right-of-way before vehicle traffic.
4	Please don't abandon people on an island in an intersection. Either eliminate this portion or provide safe passage to a destination (e.g. McD, Sun Valley).	If the expectation is that bikes will use this route to connect between the east bound bike lane and the new bike path, this turn is too tight for adult trikes and tandems like my disabled daughters use.
5	What is the purpose of this? Doesn't conythinect to anng	Consider adding bike queuing area so riders can safely transition from proposed SUP to road and existing bike lane as island is not large enough to be a safe haven in the transition.
6		Radius [to Tropical Smoothie Café] allows cars to turn too fast and are dangerous for vulnerable road users.
Jumpers Hole Road under MD 100 / MD 10 overpass		
1	This overpass has been struck twice with tall loads. Overpass lower than normal. resulted in Jumpers closure to repair. any recomendations for corrective actions?	Please ensure the mixed-use path is sufficiently protected from vehicle traffic in this area. The bollards installed previously have already been hit indicating vehicles are likely to strike vulnerable road users.
2	When will the noise wall be installed as originally proposed when this project was approved?	ovwerpass struck several times resulting in closure of Jumpers to reapir. Any recommendation or acknowledgement in study to address low overpass
Intersection of Evening Star at Jumpers Hole Road		
1	add infrastructure to support MTA bus pull off. Same Route as bowling alley stop. Puts stop closer to riders on this end of Road.	add infrastructure to support new Bust Stop. Same Rote as Bowling Alley. Closer for riders on this end of road eliminare need to walk Jumpers Hole further
2	I support this crosswalk. the crosswalks at ritchie hwy and walmart have drivers whip around corners without looking. This is a much safer place to cross.	This crosswalk will be greatly appreciated. I like to do daily walks throughout the area and this area can be difficult to navigate when walking on that side of the street where there is no sidewalk.
3	Does traffic volume from evening star and Ashbury meet warrants for traffic light?	Does intersection support a warrant for a light? Can a circle be use instead?
4	turn left lane into evening star drive, with a turn left traffic light signal	What will through traffic queuing at light do to intersection with Woodholme?
5	What will be done to prioritize people (walkers, riders, rollers, etc) at the intersection?	guard rail installed by DPW after vehicles struck houses here. Guard rail consistently hit still
6	[Guardrail] installed by AACODPW after residentts were struck. guard rail is still hit on regular basis	
Proposed Connection between Evening Star and Woodholme Circle (N)		
1	Including a sidewalk (or a wide enough lane for comfortable ped access) would mitigate my concern of no sidewalk connecting to Evening Star. Coming from Creekstone, I would cross through here, then cross Jumpers at the island.	
2	Development of lots appear imminent -How will that affect this proposal?	
3	were property lines field verified by survey? especially on Jumpershole	
Intersection of Woodholme Cir (N) at Jumpers Hole Road		
1	what about water meter re-location	Suggest Guard rail entire length for safety reasons
2	Do not see Cross section detail for this area with island showing lane widths etc. Can one be provided. Based on legend island will be grass, who has responsibility to maintain	utility pole has medium to HV lines costly to move
3	Can we connect this sidewalk to Evening Star? If I'm walking from Creekstone, I'm going to prefer crossing here because of the island.	car into house, boulder and landscape barrier not noted as requiring to be removed
4	How will curb and island affect through traffic heading to Rt 2 when vehicles are making left into woodholme? Will timing between lights at Wall Mart and Eveing star be affected?	General Comment - no pedestrian accidents I am aware of. Invitting them without reducing traffic volume is dangerous
5	How will traffic Queuing for light at evening star affect intersections at woodholme	Prefer sidewalks offered in this option
6	will left turn be allowed onto Woodholme if coming from Rt 2? How will thru traffic be affected?	thank you for including this island!
7	will bike trail be bidirectional? and striped accordingly	Please include recommendations for safety features to accompany island such as crossing signals, raised crosswalk/intersection, flags, etc.
8	Bike traffic coming from RT 2 is at risk as is driver exiting woodholme given bike travel in opposite direction of vehicles on jumpers hole - Dangerous	what is impact of left turns onto woodholme from jumpers in either direction?
9	install speet camera for traffic coming from MD 177	add speed camera for traffic approaching from MD 177
10	Do homeowners become repsosnible for maitnentace of walkways to include snow and ice given it is on a rightaway and not county property?	
11	replace [removed wall] with guard rail at minimum to protect property. Has proposed removal been discussed w/ prop owner?	
12	Is the recommended gap between the road and multi-use path going to be hardened in a way that will sufficiently protect vulnerable road users from the existing and anticipated future traffic?	
13	what standard was used to determine width of proposed bike/pedestrian path?	
Intersection of Woodholme Cir (S) at Jumpers Hole Road		
1	It's a tough call between the options - sidewalk on this side vs wider SUP. I would like to see an option with the SUP on this side of the street, since there will be more foot/cycle traffic on this side.	In either option, consider adding greenery to beautify corridor
2	what is purpose of this sign [curve warning] also is speed an error?	Car Struck Tree
3	Lot is no longer vacant need to plot current dwelling on property	Please consider including recommendations for safety features for Vulnerable Road Users such as raised crosswalks or entire raised intersection. Allow pedestrians/wheelchairs to cross without having to change elevation.
4	How will improvements address concerns of AACOPD having adequequate space for speed enforcement?	will left turns from Jumperhole affect through traffic? Was discussed lights will be timed.
5	These still images only tell half the story. Here is a video of an accident where a vehicle spun around in the middle of Jumpers Hole. https://vimeo.com/manage/videos/320065290	Tree likely to obstruct walk
6	To update your image ... I also have a mailbox that may need to be moved in addition to several 1-ton boulders that were placed when a careless driver slammed into my house! https://vimeo.com/313942534	add speed camera for traffic approaching from Rt 2
7	vehicle struck tree	fence removed after being struck and repaired numerous times
8	How will curb affect through traffic heading to Rt 2 when vehicles are making left into woodholme? Will timing between lights at Wall Mart and Eveing star be affected?	who is responsible for maintenance andsnow removal
9	Bike traffic coming from RT 2 is at risk as is driver exiting woodholme given bike travel in opposite direction of vehicles on jumpers hole - Dangerous	car into porch
10	Storm drain requires regular maintenance because of ravine issue mentione by Bowling Alley. Also causes flooding at intersection	
11	need to address blidh spot created by fence and shrub in rightaway. road offset to left with obstruction and speed is an issue	Regularly see pedestrians with groceries walking along this side of the road. The shoulder is dangerously narrow, sidewalk or shared use path would help.
12	originally had a fence but was taken down because they got tired of repairing it because of vehicle striking it	need to addres drainage ditch maintenance for flow toward creek in end of circle
13	recommend speed camera for approaching traffic from Rt 2	pole, fence, cable box struck several times
14	car has struck house [north of bank] multiple times	propose guard rail thru this area
15	MDOT TD statndards indicate 11 foot min for such roads. Can we get more than the min rating? of this nature	
16	utility pole and fence struck frequently. road design is poor and contributes to speed with quick choke down. Can this be tapered out further and guard rail added	
17	Who is repsonsible for clearing snow and ICE during winter?	
18	need to improve ravine and outfall at Jumpershole Road as this takes runoff and often backs up	
19	utility pole and fence struck frequently. road design is poor and contributes to speed with quick choke down. Can this be tapered out further and guard rail added	
Intersection of Walmart Signal at Jumpers Hole Road		
1	Install a Truck Traffic Cam like the one on Broening Hwy to reduce Jumpers Hole traffic and enforce the sign already there as the police do not have the resources. Sign says, "No Thru Trucks over 5T GVW, 9AM - 6PM". JHR: https://vimeo.com/327634351	Install a Truck Traffic Cam like the one on Broening Hwy to reduce Jumpers Hole traffic and enforce the sign already there as the police do not have the resources. Sign says, "No Thru Trucks over 5T GVW, 9AM - 6PM". JHR: https://vimeo.com/327634351
2	How does bus stop affect proposed traffic flow -see option 2	Can a raised, covered, ADA compliant bus station be added to the recommendation to entice ridership, especially with Walmart being a major destination?
3	Never terminate a SUP abruptly without a plan to get the vulnerable road users to safety. Recommend extending the SUP to the B&A trail. Although beyond the scope of this project, it should be planned prepared.	How does bus stop impact planned flow? This is bustiming & driver change point often sitting 20 minutes
4	Please ensure that improvements provide priority to Vulnerable Road Users and allow people walking to safely cross.	I prefer the shoulder in option 2, as opposed to the wider lane in option 1. Some drivers gain a lot of speed here before the road narrows, so just keep it narrow throughout.
5	Continue Shared Use Path? Should connect all the way to B&A Trail	Where are bikes suppose to go after this point? If they are trying to get to the trail (a major bike spine in the county), then a safe route should be included through the most dangerous section of this route.
6	Straighten this [west side curb line] out to allow another lane for southbound cars to turn right onto Jumpers. It often backs up here the morning - right turn lane will be clear, but blocked by straight queue	Please ensure Vulnerable Road Users are given priority at this intersection.
7	General - Has AACOFD been afforded opportunity to weigh in yetal impact to response time is?? They provide regular EMS/ALS support to facilities in area. Potenti	Shared Use Path should continue all the way to B&A trail
8		Straighten out this sidewalk to extend right turn lane (southbound Jumpers, right onto northbound 2)
9		General - How will AACOFD repsonse time be affected especially EMS/ALS to this area
10		support extending the shared use path to Ritchie Hwy

APPENDIX J: FULL PLAN SETS OPTION 1 AND 2 AND TYPICAL SECTIONS



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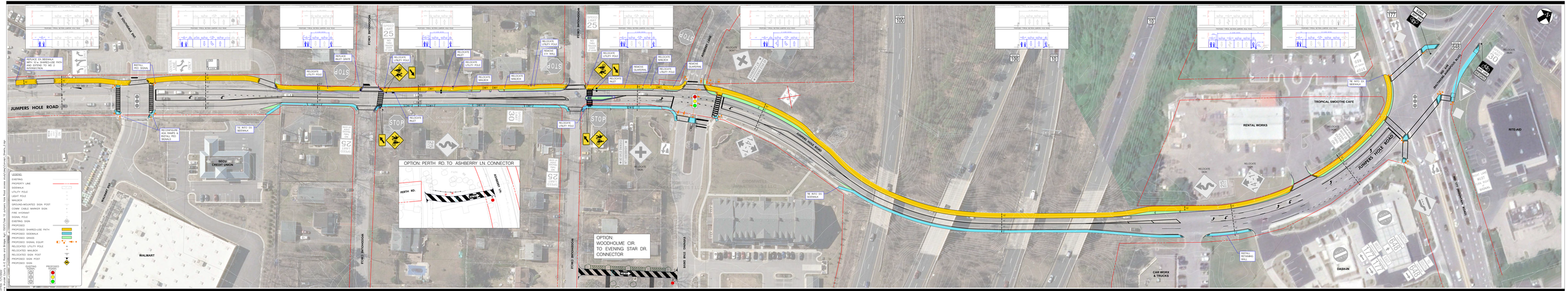
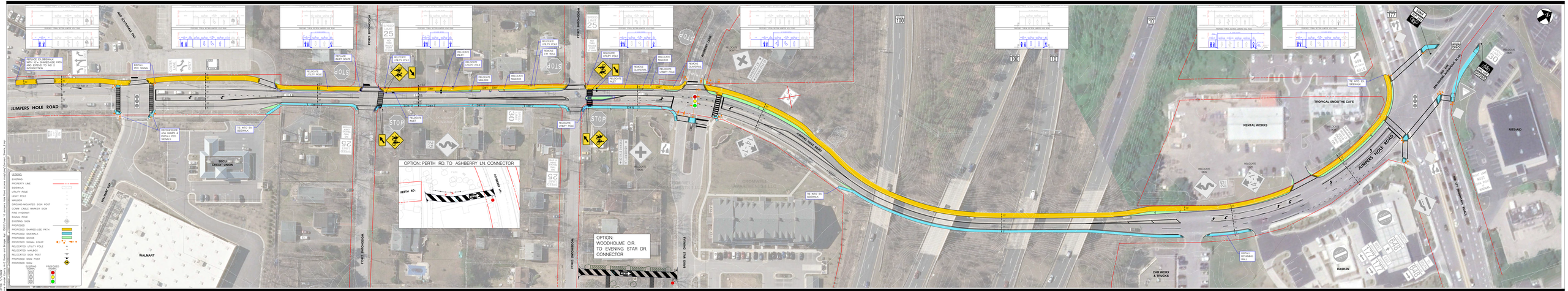
Jumpers Hole Road Option 1: At-grade Side Path Along the West Side

SCALE: 1" = 50'



Mead & Hunt

Jumpers Hole Road Option 2: Closed–Section with Side Path and Sidewalk



Mead & Hunt

Jumpers Hole Road Option 2: Closed–Section with Side Path and Sidewalk

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1.0 EXECUTIVE SUMMARY

Jumpers Hole Road is a north-south two-lane minor arterial of varying width within the Pasadena/ Marley Neck Small Area Plan and is maintained by Anne Arundel County. The segment of Jumpers Hole Road under evaluation is about 2/3rd of a mile in length and connects Richie Highway (MD 2) with Mountain Road (MD 177), passing through both residential areas and commercial developments. The intersections of MD 2 at Jumpers Hole Road and MD 177 at Jumpers Hole Road are maintained by MDOT SHA. This corridor has limited pedestrian and bike facilities and average weekday traffic of about 20,000 cars per day. With transit stops, shopping, and proximity to the popular Baltimore & Annapolis hiker-biker trail, Jumpers Hole Road is in need of pedestrian and bike infrastructure upgrades. Additionally, speed management is a concern for residents whose property abuts Jumpers Hole Road. Finally, a primary impetus for this study is the general difficulty in accessing mainline Jumpers Hole Road from the three residential side streets that are all stop-controlled – Evening Star Drive / Ashberry Lane; Woodholme Cir (N); and Woodholme Cir (S). An added concern is the congestion at the southern end of the segment – in between MD 2 and the signalized entrance to Walmart.

This report identifies alternatives to address vehicle access from side streets; bike and pedestrian improvements; and speed reduction, as well as congestion management, without increasing the number of through travel lanes. This report documents existing traffic conditions, crash history, and overall roadway geometry (existing infrastructure, roadway dimensions, locations of utilities and other obstacles, etc.). Existing traffic conditions were modeled and validated using industry-standard software, which was then modified to test several different engineering designs for providing gaps in Jumpers Hole Road traffic to allow side street access, while also preserving the limited available right-of-way for installation of curb-protected side paths and sidewalk. Based on an evaluation of these designs this report's recommendations include:

- Installing a full traffic signal the intersection of Evening Star Dr and Jumpers Hole Road. This signal will allow residents along Ashberry Lane and Evening Star Drive to have controlled dedicated access to Jumpers Hole Road. Additionally, signalized pedestrian crossings and marked crosswalks are recommended at the intersection. Finally, the signal is recommended to be timed and coordinated with the Walmart traffic signal, such that both signals are red along Jumpers Hole Road at the same time in order to facilitate easier egress to Jumpers Hole Road from Woodholme Cir (N) and (S).
    - Two new one-way roadway connections are also recommended parallel to Jumpers Hole Road. These connections would enhance egress opportunities for Woodholme residents by connecting Woodholme Cir (N) to Ashberry Lane and Evening Star Drive, respectively, providing an opportunity for residents of the Woodholme neighborhood to utilize the recommended signal for egress, if desired. These connections are anticipated to be constructed after the traffic signal at Evening Star Drive is built. Once the connections are completed, signal timing changes may then be adjusted, as needed, to reflect any changes to travel patterns.
- Marked crosswalks are recommended for crossing Jumpers Hole Road at Woodholme Cir (N) and (S), with pedestrian refuge median islands where feasible.
- Pedestrian signals and marked crosswalks are recommended for crossing Jumpers Hole Road at the existing Walmart traffic signal.

- Pedestrian signals and marked crosswalks are recommended at the intersection of Jumpers Hole Road and Mountain Road (MD 177).
- A buffered shared use path is recommended along the west side of Jumpers Hole Road where there is existing right-of-way. This path can vary in width from 8 feet to 10 feet and extend from MD 2 to MD 177.
- Evaluating the feasibility of traffic calming is recommended corridor-wide and at unsignalized intersections along Jumpers Hole Road through the Woodholme neighborhood to reduce instances of speeding and to enhance pedestrian and bike crossing safety.
- Upgrading the MTA bus stop with shelters, crosswalks, and ADA complaint landing areas is recommended.
- Adding sidewalk along the east side of Jumpers Hole Road is recommended.
    - Proposed sidewalk from Evening Star to MD 177 is within existing public right-of-way.
    - Proposed sidewalk from Evening Star south to the Walmart signal is largely in private right-of-way and will require an easement.
- Adding lighting under the MD 100 / MD 10 overpass is recommended to light the proposed shared use path and sidewalk.
- Interim traffic improvements evaluated in this study include repurposing the northbound left-turn lane from Jumpers Hole Road, at the Walmart signal, into a southbound receiving lane. A recommended longer-term traffic improvement is for a new northbound right turn lane along Jumpers Hole Road from MD 2 to the unsignalized Walmart Driveway.

2.0 INTRODUCTION

2.1 Project Purpose

Jumpers Hole Road is a north-south two-lane minor arterial of varying width within the Pasadena/ Marley Neck Small Area Plan and is maintained by Anne Arundel County. The segment of Jumpers Hole Road being evaluated is about 2/3rd of a mile in length and connects Richie Highway (MD 2) with Mountain Road (MD 177). This segment passes through residential areas and commercial developments. There are transit stops within the study corridor, and access to the popular Baltimore & Annapolis hiker/ biker trail is just ¼ mile south of the MD 2 intersection. There are limited parallel north-south routes for additional traffic to travel between neighborhoods north of Mountain Road and those south of MD 2. Accordingly, the arterial, which is already close to reaching existing roadway capacity, is expected to experience both regional and local traffic growth. Additionally, this segment of Jumpers Hole Road has narrow shoulders, no bikeable facilities, and limited sidewalk, which is not conducive to the residential land use abutting the facility. Finally, speeding along Jumpers Hole Road and a general inability to access it from side streets have been primary drivers for activating this study.

2.2 Project Need

The purpose of the Jumpers Hole Road transportation facility planning study is to develop recommendations to address several deficiencies, such as increasing pedestrian and bicycle accessibility and safety; managing vehicle speed through modified roadway designs and typical sections; and improving egress onto Jumpers Hole Road from intersecting neighborhood streets. The relatively short distance along the corridor between commercial centers and existing and newly-constructed residential

areas means that the arterial is suitable for some trips to be made by walking and biking. This underscores the need for pedestrian and bicycle accommodations, which are limited and do not meet current County standards. The report also identifies alternatives to address existing traffic congestion while also providing opportunities for side street access to Jumper's Hole Road. Additionally, this report provides typical roadway cross-section and conceptual plans for addressing pedestrian and bike access in the short term and long term.

2.3 Study Methodology

To address the corridor's needs, several designs were developed and tested. These alternatives include bike lanes, sidewalks, paths, new traffic control devices, revisions to existing signal timing/phasing, and new intersection improvements. These alternatives were developed to a conceptual level, allowing comparison of each idea's: right of way needs; number of utilities to be relocated; and planning-level constructions costs. Additionally, these options were also analyzed for:

- Creating *new* gaps in Jumpers Hole Road traffic to allow for vehicle access from side streets.
- Changes in vehicular travel time through corridor.
- Standard roadway capacity analysis (e.g., level of service, volume-to-capacity ratio, and approach queue lengths).
- Undesired traffic impacts, such as *new* traffic constraints and queue spillbacks.
- Enhancement of the existing pedestrian and bike infrastructure.

After these metrics were developed and compared across alternatives, the results were presented to County agencies in Planning and Engineering, as well as local communities and neighborhood associations for review and discussion. Based on the inter-agency and community feedback, short-term and long-term plans were developed to 10% design, with further details and identified for the next design phase.

3.0 STUDY AREA LOCATION AND LIMITS

The study area consists of the Jumpers Hole Road corridor from Governor Ritchie Road (MD 2) to Mountain Road (MD 177). Based on input from Anne Arundel County, eight intersections were identified for inclusion in this study:

1. Jumpers Hole Road at MD 177
2. Jumpers Hole Road at Evening Star Dr
3. Jumpers Hole Road at Woodholme Circle (N)
4. Jumpers Hole Road at Woodholme Circle (S)
5. Jumpers Hole Road at Walmart Entrance
6. Jumpers Hole Road at MD 2
7. MD 2 at Patriots Plaza driveway
8. MD 2 at Wishing Rock Rd
9. Evening Star Dr at Twilight Way[1]

Figure 1 shows the study area intersections.

[1] The original 2017 study included the intersection of Evening Star Drive at Shopping Center driveway, when the development of Creekstone Village was just beginning. As of late 2021, most of the development is built out, so this intersection was evaluated again because it provided additional data on how portions of Creekstone Village utilize the Shopping Center driveway for access.

Figure 1: Study Area intersections

4.0 EXISTING CONDITIONS

This section highlights relevant data and observations, collected during the study and includes:

- Preliminary discussions with the local communities
- Roadway characteristics
- Pedestrian and bike facilities
- Transit facilities
- Crash history
- Speed and traffic conditions

4.1 Preliminary Community discussion

In the summer of 2021, the County informed local neighborhood associations of the study initiation and provided a short online survey for local residents. Additionally, in September 2021, Anne Arundel County hosted a virtual conference with leaders of local civic associations and HOAs along Jumpers Hole Road, with the intention of letting the neighborhood know that the study was restarting[2] and to discuss community concerns.

4.1.1 *Community Survey*

Prior to the County's virtual conference with leaders of local civic and homeowner associations, an online survey was conducted in the early Fall of 2021 to engage to quantify and prioritize specific corridor needs. The survey included the following five questions (graphical responses follow each relevant survey question):

1. *In what community do you live?*
2. *Please rank the issues below in order of importance to you, from highest to lowest, regarding Jumpers Hole Road.*

The top ranked concerns are shown in Figure 2:

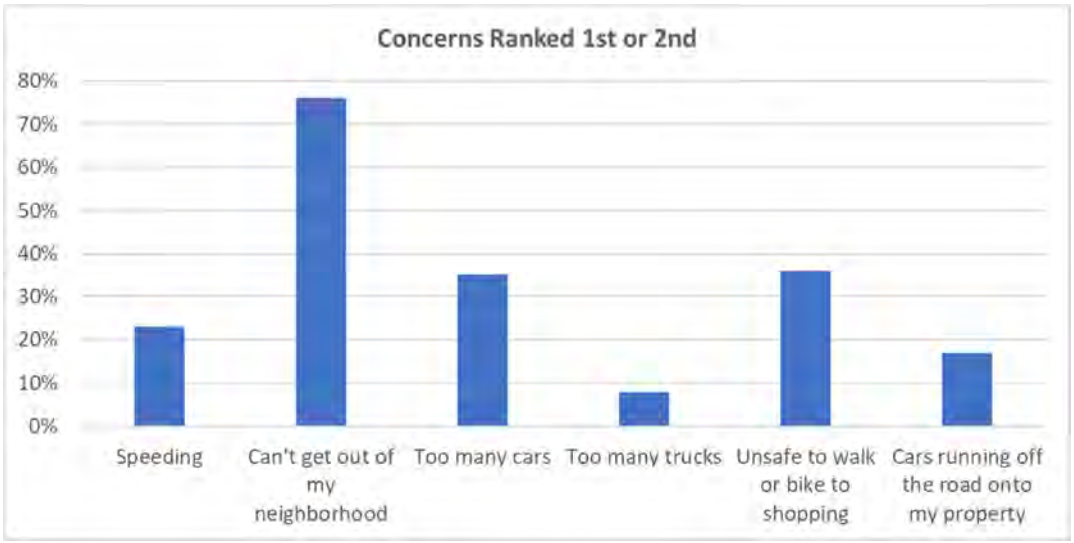

Figure 2: Top Concerns of Residents around Jumpers Hole Road

[2] The Study was originally conducted from 2016 to 2018 but was paused before restarting in 2021.

3. *What time of day, if any, do you have difficulty getting out of your neighborhood onto Jumpers Hole Road by car?*

The time of day when residents have difficulty egressing onto Jumpers Hole Road are shown in Figure 3.

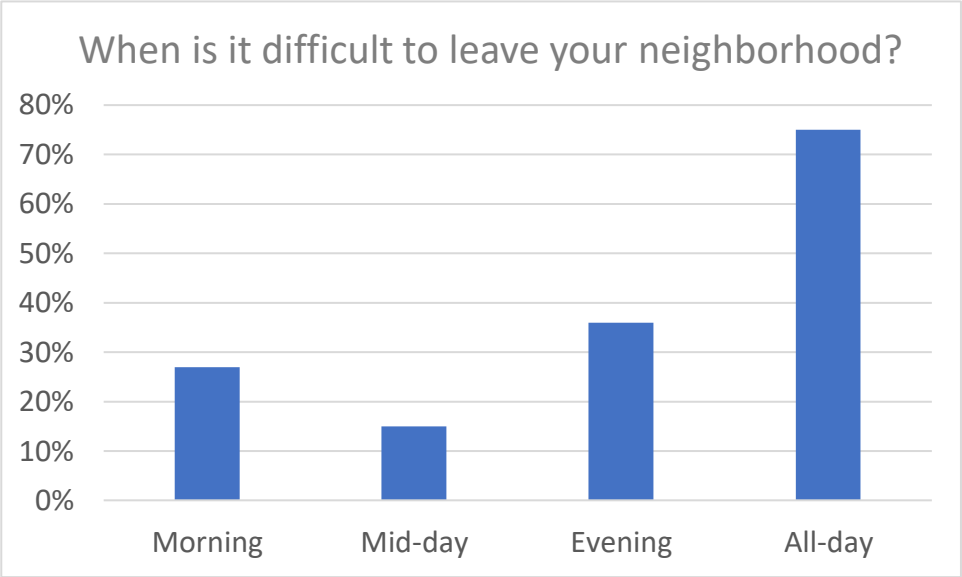

Figure 3: Resident response to time of day when egress is difficult

4. *Which of the following improvements would you like to see along the Jumpers Hole Road corridor? (select all that apply)*

The preferred improvements that residents would like to see implemented along Jumpers Hole Road are shown in Figure 4.

Figure 4: Percentage of Respondents preferring each corridor improvement

5. *If pedestrian and/or bicycle amenities were to be provided along Jumpers Hole Road, please rank the potential options below in order of preference, from highest to lowest:*

Preferred bike/pedestrian improvements are shown in Figure 5.

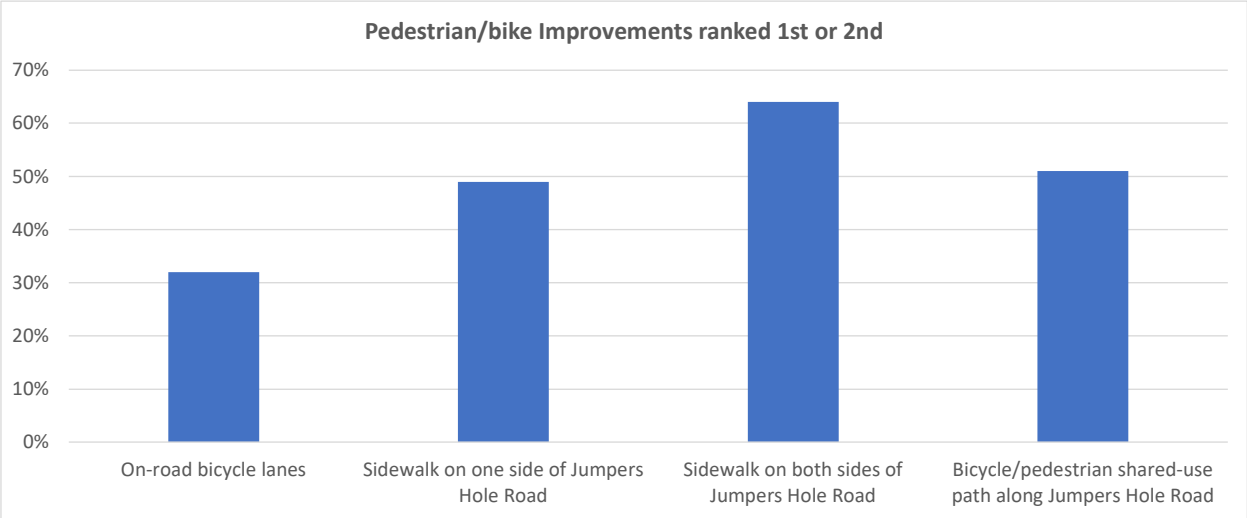

Figure 5: Preferred Bike/pedestrian improvements along Jumpers Hole Road

4.1.2 *Community Presentation – Project Initiation*

Following the survey, the County presented to community leaders on the survey results and also covered the established purpose and need of the project. This presentation also covered the pending data collection effort, study methodology, potential short and long-term options that could be considered, and next steps. A copy of the presentation is shown in *Appendix A.*

The following community comments/concerns stemmed from this initial presentation:

- Need to look a traffic flow from an areawide perspective.
- Desire to see potential new access points (e.g., Wishing Rock Road).
- Any right of way takes should be all from either the west or the east sides of Jumpers Hole Road – not partial takes from both sides.
- Interest in a traffic circle solution at Evening Star Drive / Jumpers Hole Road.
- Bike/pedestrian travel is not safe and does not provide safe access to the B&A trail.
- Desire to see arterial classification of Jumpers Hole Road downgraded.
- Need more access to MD 2.
- Interest in a pedestrian bridge over MD 2.
- Explore short term strategies for traffic calming.

4.2 Roadway Characteristics, Land Use, and Peak Period Observations

Jumpers Hole Road is a County-maintained, two-way urban minor arterial running north-south between Governor Ritchie Highway (MD 2) and Mountain Road (MD 177). The posted speed limit on Jumpers Hole Road is 30 mph. The Average Annual Weekday Daily Traffic Volume was approximately 21,000 in 2016

when the study first originated[3]. The roadway is primarily a two-lane undivided open-section roadway with 12-foot lanes and no shoulders. There are partial segments of the roadway with 4-inch asphalt curbs and 4-foot' paved shoulders in the segment adjacent to the Woodholme neighborhood; other segments have no curbs or are closed-section (i.e., curb and gutter pan). See Figure 6. Public right-of-way at the narrowest segment of Jumpers Hole Road, through the Woodholme Circle neighborhood, is about 40 feet wide.

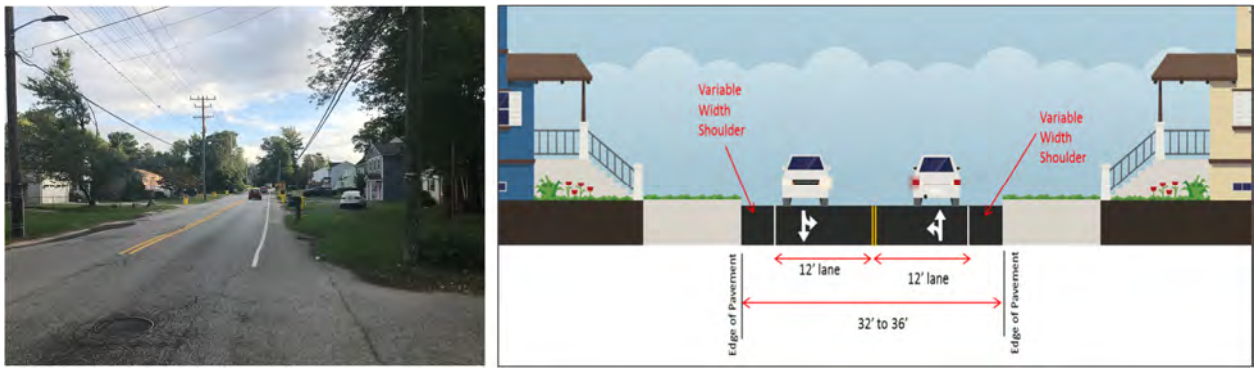

Figure 6: Typical Section and view of Jumpers Hole Rd through Woodholme

4.2.1 *Peak Hour Observations*

A professional engineer conducted AM and PM peak commuting period observations along the study corridor. Relevant observations from those time periods, as well as general observations, are as follows.

General Observations:

- Southbound left turns onto Evening Star can sometimes completely block southbound through-traffic on Jumpers Hole Road, due to the slight off-set of Evening Star / Ashberry approaches.
- Adequate sight distance is available from side streets, when no vehicles are obstructing upstream traffic.
- Northbound left turns into the Woodholme neighborhood block traffic universally.
- Northbound right turns into the Walmart unsignalized driveway are a very slow maneuver, forcing all northbound drivers behind to slow down appreciably.

AM Peak Period observations:

- 3 pedestrians and 1 cyclist were observed in 30 minutes.
- Northbound and southbound school buses board/alight along Jumpers Hole Road, as well as in the neighborhood.
- Vehicles were observed traveling mostly in platoons when heading northbound.
- Multiple gaps in platoons along Jumpers Hole Road were noted during observation period.
- Residents park along Evening Star to drop off schoolchildren for the bus; however, the approach lane is wide enough not to block egressing commuters.
- Based on a spot count, peak hour volumes for Woodholme Circle (N) and (S) were 6 ingress, 24 egress – this count is similar to counts taken in 2016, where 6 ingress vehicles and 31 egress

[3] As discussed in section 4.6, a subsequent traffic count in the fall of 2021 showed an average weekday traffic count of 19,000 cars per day.

vehicles were observed. Year 2016 counts from Woodholme Circle (N) and (S) were applied in all traffic analyses.

PM Peak Period observations:

- Significantly more traffic was observed than during AM peak period but gaps in traffic were still observed along Jumpers Hole Road.
- Southbound Jumpers Hole Road queues from MD 2 can spill upstream through the Walmart traffic signal and occasionally to Woodholme Circle (S).
    - During these lengthy queues, westbound left-turning vehicles from the Walmart signal cannot enter onto southbound Jumpers Hole Road, because there is only one southbound receiving lane.
- Northbound Jumpers Hole Road queues from the Walmart signal can spill back almost to MD 2, often reaching the Exxon gas station driveway.
- Southbound left turns into the Walmart unsignalized driveway prevent drivers behind them from reaching the southbound left turn lane at MD 2.
    - This action results in uneven southbound lane utilization along southbound Jumpers Hole Road at MD 2.
    - Many southbound left turns were observed entering into the Walmart unsignalized driveway. A spot count yielded 10 cars in 15 minutes. These left-turning vehicles, while legal, result in queues of motorists whose ultimate destination is to turn left, *not* at the Walmart driveway, but ultimately at MD 2.
- At the Walmart signal, the southbound left turn phase immediately follows the east/west concurrent phase; this leading left phase results in a long stretch of continuous red time for northbound traffic along Jumpers Hole Road. This long red time results in lengthy northbound queues.
- Westbound right turns from Walmart unsignalized driveway often queue ten cars deep, because the northbound approach to the Walmart signal is already queued with vehicles.
- 1 pedestrian was observed in 30 minutes. No cyclists were observed during the field observation.
- Based on a spot count, peak hour Volumes for Woodholme Circle (N) and (S) were 28 ingress, 22 egress – this count is similar to counts taken in 2016, where 35 ingress vehicles and 29 egress vehicles were observed. 2016 counts from Woodholme Circle (N) and (S) were applied in all traffic analyses.

4.3 Pedestrian and Bicycle Facilities

The sidewalk network within the study area is largely absent, with limited pedestrian connectivity between the shopping centers and residential areas. Sidewalks are prevalent within the new Creekstone Village townhouse and multifamily residential developments but are absent along the majority of Jumpers Hole Road, as well as along MD 177 large portions of MD 2. At this time, few sidewalks along the corridor meet the Americans with Disabilities Act (ADA) design standards. In addition, there are no marked crosswalks to cross Jumpers Hole Road within the study area, with the exception of a marked crosswalk at MD 2. Field observations noted pedestrians using the shoulder along Jumpers Hole Rd to walk along the corridor.

Currently, there are no bike lanes along the Jumpers Hole Road corridor. The shoulders of Jumpers Hole Road are variable width (from 3 feet to 9 feet, where they exist), with some segments wide enough to cycle. The southbound shoulder terminates at Asberry Lane to accommodate a right turn lane, creating conflicts with cyclists (and pedestrians) that utilize the shoulder. Since the speed limit is 30 mph, MD law allows cyclists to ride in the travel lanes[4]. Pedestrians and cyclists use Jumpers Hole Road to cross under MD 10 and MD 100, as the next closest at-grade crossings of each highway are about a mile away in each direction.

4.4 Transit facilities

The Maryland Transit Administration (MTA) and the Regional Transportation Agency (RTA) both operate bus lines within the study area. MTA Route 14 provides fixed route transit service from the Jumpers Hole Road corridor to the Patapsco Light Rail Station. RTA service is a connect-a-ride variable service and schedule route. The MTA bus route stop at southbound Jumpers Hole Road and the Walmart Shopping Center serves about 100 passengers per day. None of the bus stops along Jumpers Hole Road are ADA compliant.

4.5 Crash Data Analysis

Crash data in the study area was originally requested from the Maryland State Highway Administration's (SHA) Office of Traffic and Safety – Traffic Development and Support Division for the years 2010 through 2014. Because the study was restarted in 2021, a subsequent crash request was made to MDOT SHA for an additional five years 2016 through 2020. Seventy-five (75) crashes were recorded in this time frame. A summary of crashes by year and by injury/property damage are shown in Table 1. No fatal crashes were reported in this time frame.

Table 1: Injury and property damage crashes, by year.

Year	Fatal Crashes	Injury Crashes	Property Damage only	Total
2016	0	13	8	21
2017	0	4	4	8
2018	0	3	15	18
2019	0	9	9	18
2020	0	2	8	10
Total	**0**	**31**	**44**	**75**

[4] MD Law allows cyclists to ride on roadways that are signed for 45 mph or slower.

Additionally, fixed object crashes are separated out and summarized in Table 2. There were four fixed object crashes reported in the timeframe.

Table 2: Fixed object crashes, by year

Year	Fixed Object Crashes
2016	0
2017	0
2018	2
2019	2
2020	0
Total	**4**

Pedestrian crashes are summarized in Table 3. Three pedestrian crashes were reported in the timeframe evaluated.

Table 3: Pedestrian crashes, by year

Year	Pedestrian Crashes
2016	2
2017	0
2018	1
2019	0
2020	0
Total	**3**

Figure 7 shows the location of both fixed object crashes and pedestrian crashes along the Jumpers Hole Road corridor between MD 177 and MD 2.

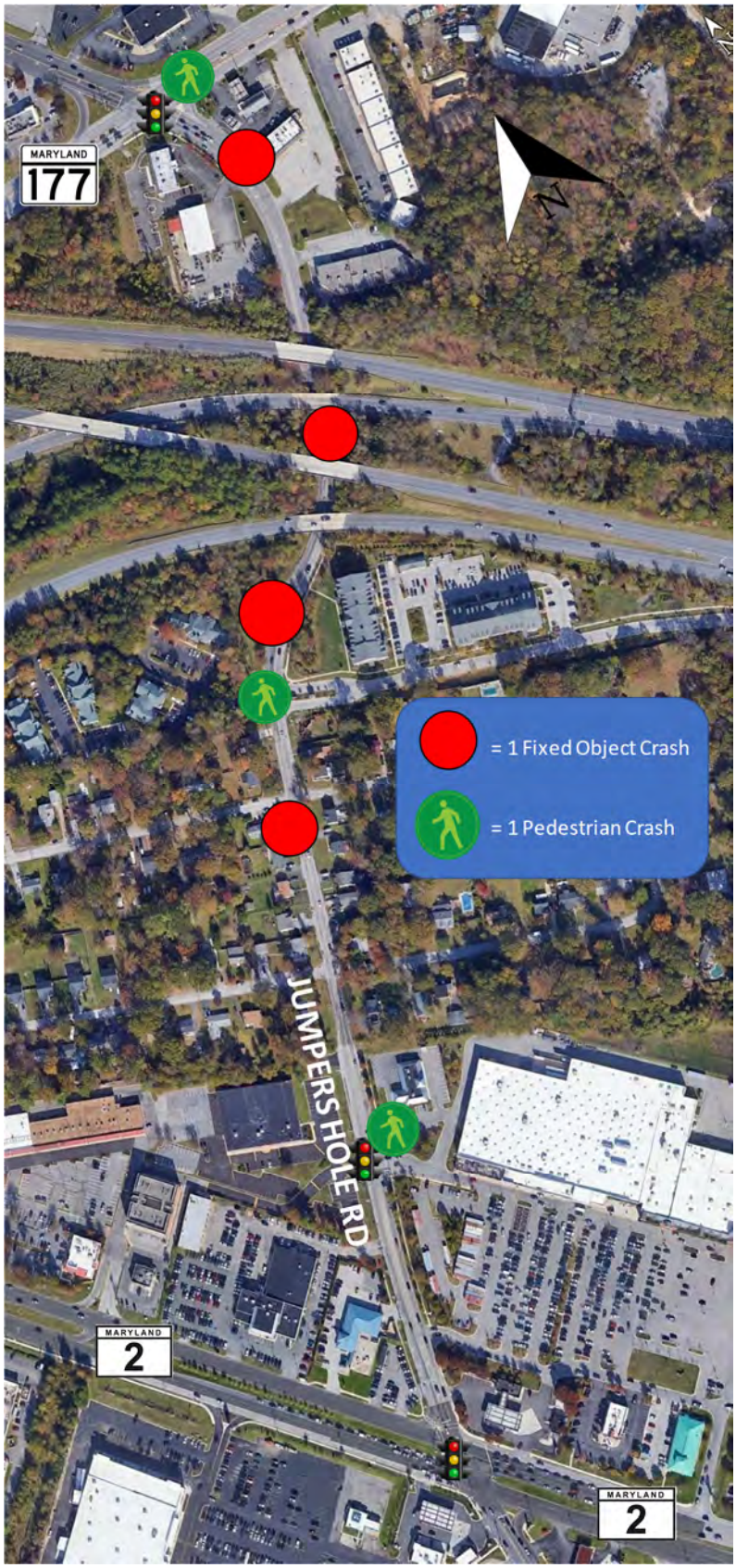

Figure 7: Locations of pedestrian and fixed object crashes

Figure 8 below shows the crash types for all non-pedestrian intersection crashes. Woodholme Circle (N) did not have any reported crashes in the timeframe. Rear-end crashes were the most common intersection crash observed. Of note, there were right angle crashes at each of the five intersections highlighted in Figure 8.

Figure 8: Crash Summary map for 2016 thru 2020

A line diagram summary of all crashes, provided by MDOT SHA, can be found in Appendix B.

4.6 Corridor Volume, Speed and Classification Characteristics

A speed and daily traffic count, by hour, was conducted midweek for 48 consecutive hours. The count was conducted in mid-October 2021. From this count, hourly volume, speed, and classification data were obtained. The average daily traffic (ADT) from this count was 19,050 vehicles per day – approximately 10% lower than the 2016 count of 20,900 vehicles per day, with the hourly volumes in throughout the day almost universally lower than in the 2016 count. However, the AM and PM peak period volumes were similar in both 2016 and 2021. The primary reason that the daily traffic volume in 2021 was 10% lower than 2016 is due to a large drop off in hourly volumes, in between the two years, *after the 5:00 PM hour, from 6:00 to midnight*, as shown in Figure 9. The blue hourly volumes (representing 2021) were substantially lower than the orange hourly volumes (representing 2016) after the 5:00 PM hour.

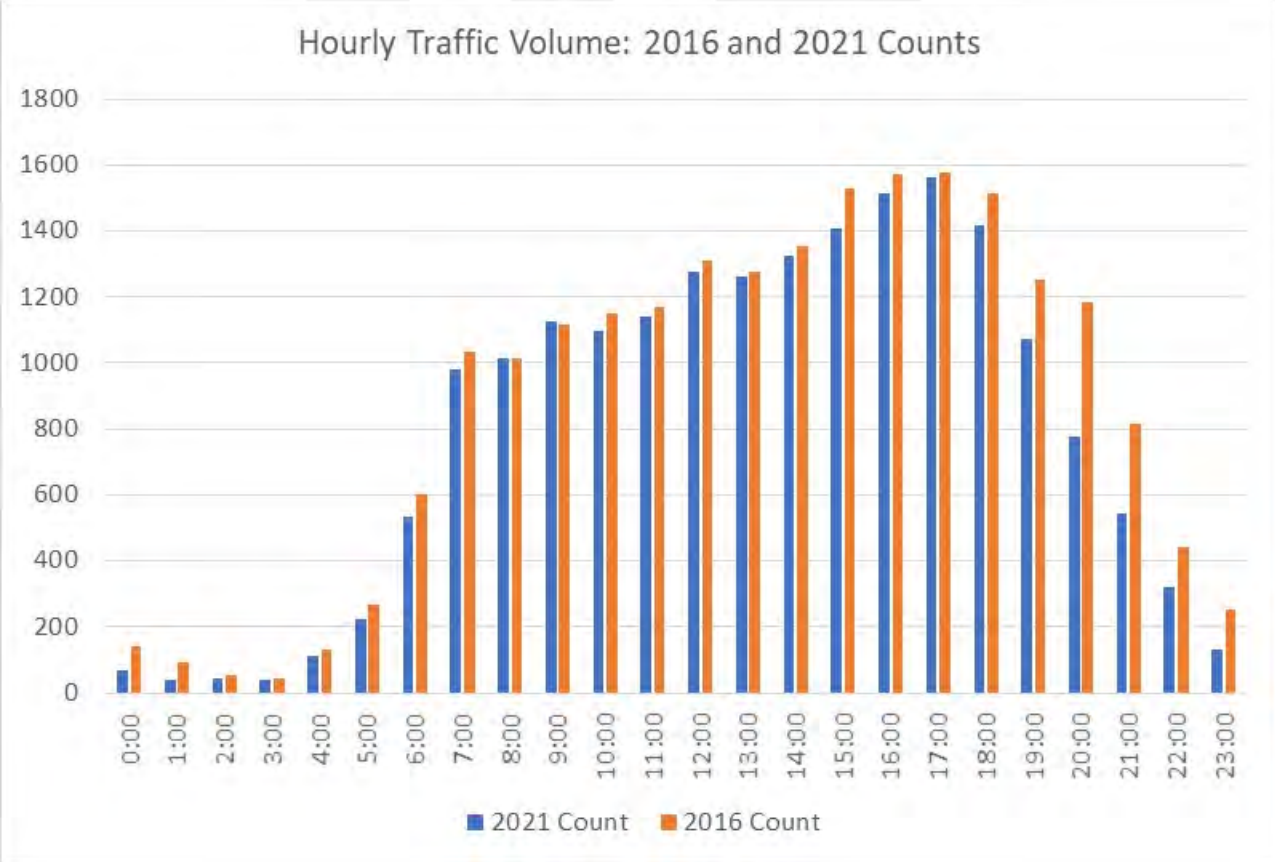

Figure 9: Daily volume, by hour in 2021 and 2016

The average hourly vehicle speed is shown in Figure 10 for northbound and southbound Jumpers Hole Road. The location for data collection was in between Woodholme Circle North and South. The average speed measured was similar to both northbound and southbound speed measurements taken in 2016 (see Figure 11). Of note, in both speed studies, the northbound speeds are consistently higher than southbound. Additionally, the average speed is only modestly higher than the posted speed limit of 30 mph.

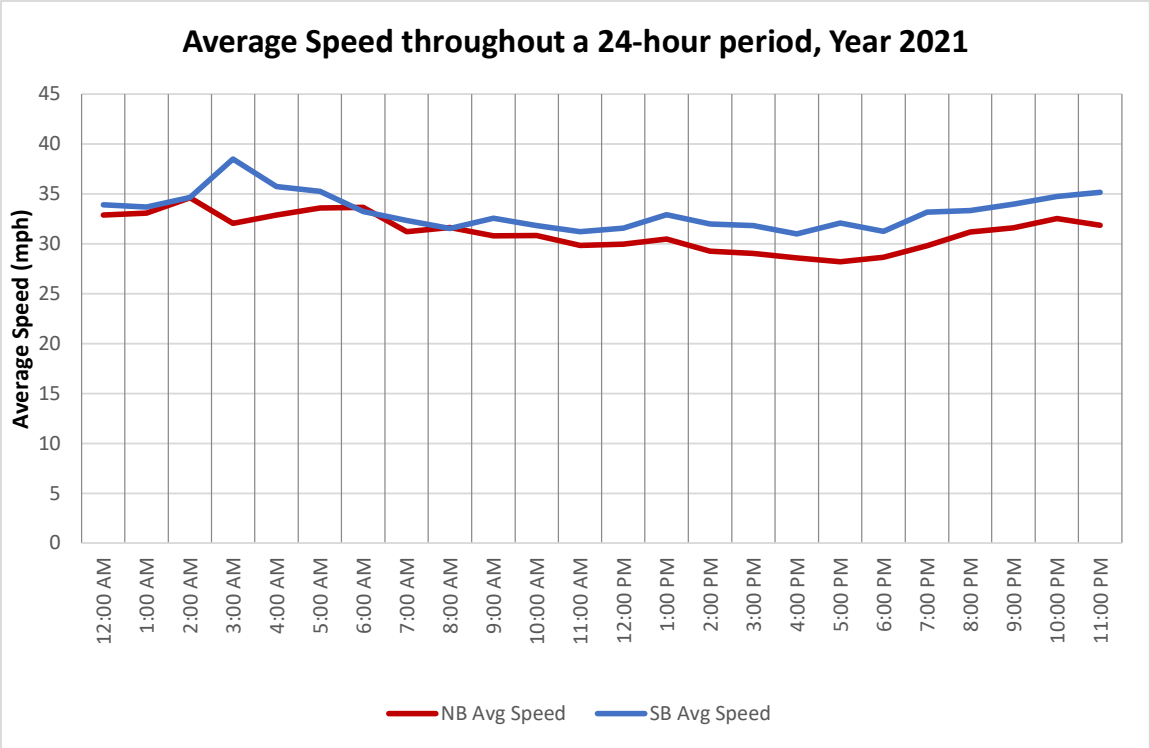

Figure 10: Average weekday speeds by time of day – data from 2021

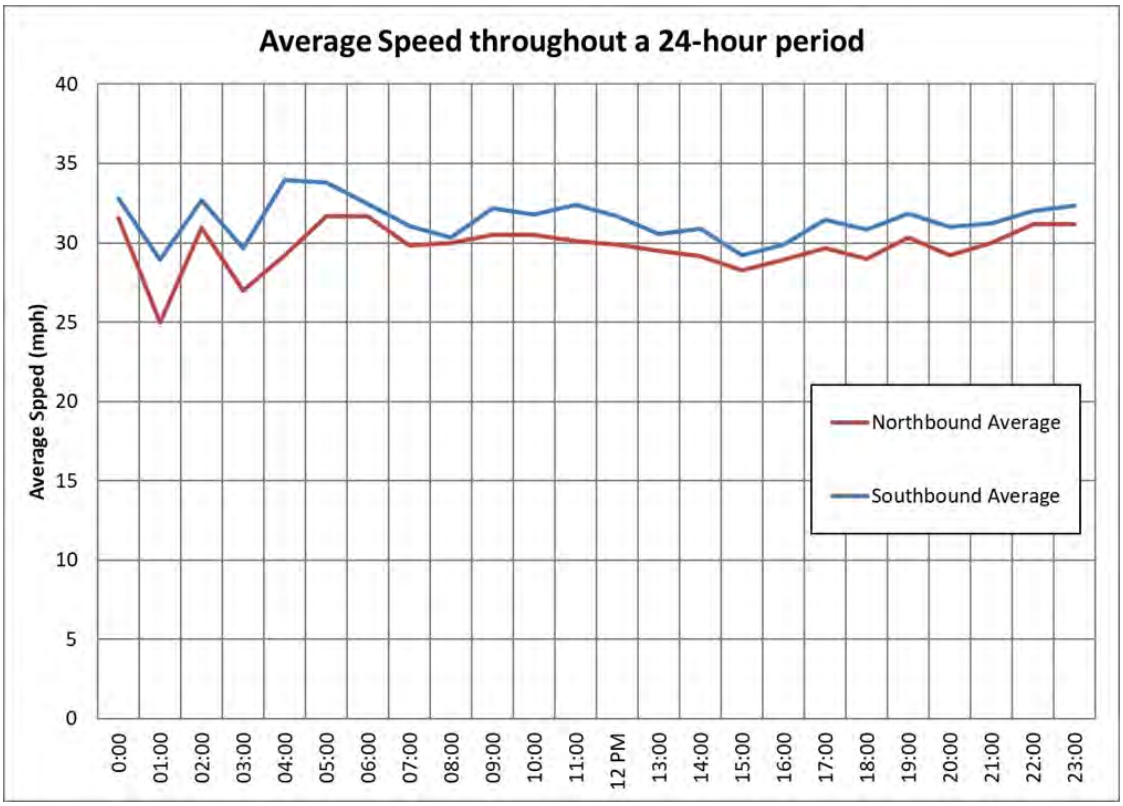

Figure 11: Average weekday speeds by time of day – data from 2016

In order to capture the actual degree of excessive speeding that isn't necessarily revealed in *average* speed calculations, additional data was summarized to include:

- Percent of vehicles in each direction traveling in excess of 35 mph, on an hourly basis (Figure 12)
- Percent of vehicles in each direction traveling in excess of 40 mph, on an hourly basis (Figure 13)

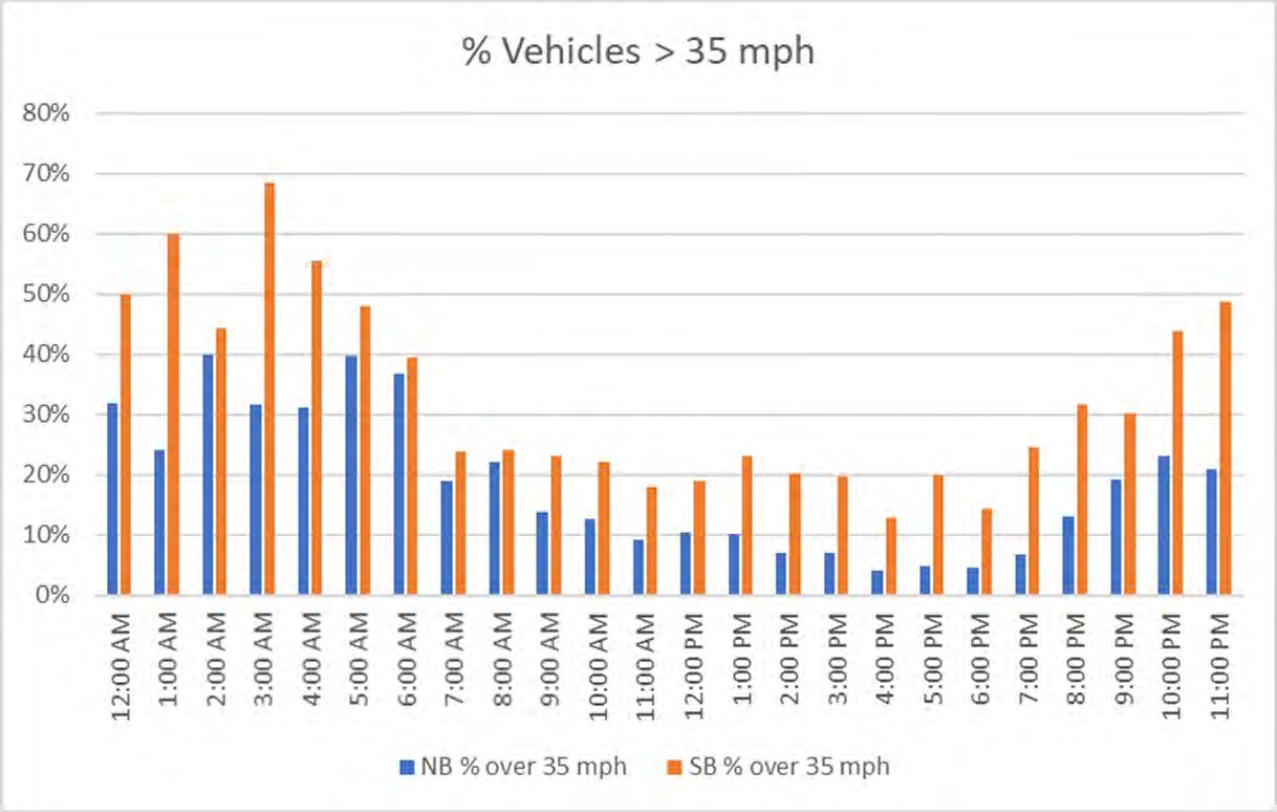

Figure 12: Percent of vehicle traveling in excess of 35 mph, by time of day

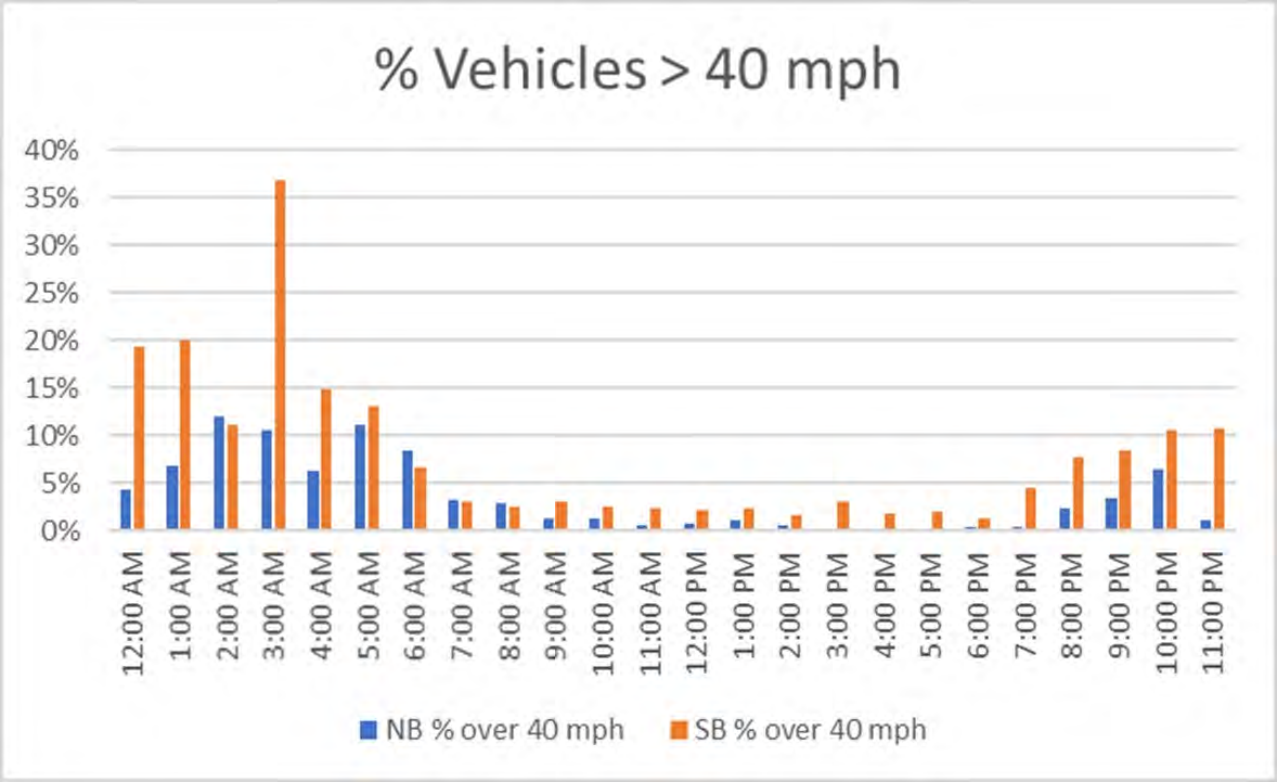

Figure 13: Percent of vehicle traveling in excess of 35 mph, by time of day.

Finally, 85th % speeds were calculated, where for the northbound and southbound directions:

- The northbound 85th % speed over the course of a 24-hour period is 34 mph.
- The southbound 85th % speed over the course of a 24-hour period is 37 mph.

Vehicle classification was also measured, with 97.5% of all vehicles having a FHWA Class 1 through 4 (motorcycles, passenger cars, passenger trucks, and buses, respectively). The remaining vehicles are largely Class 5 – box trucks. See Figure 14.

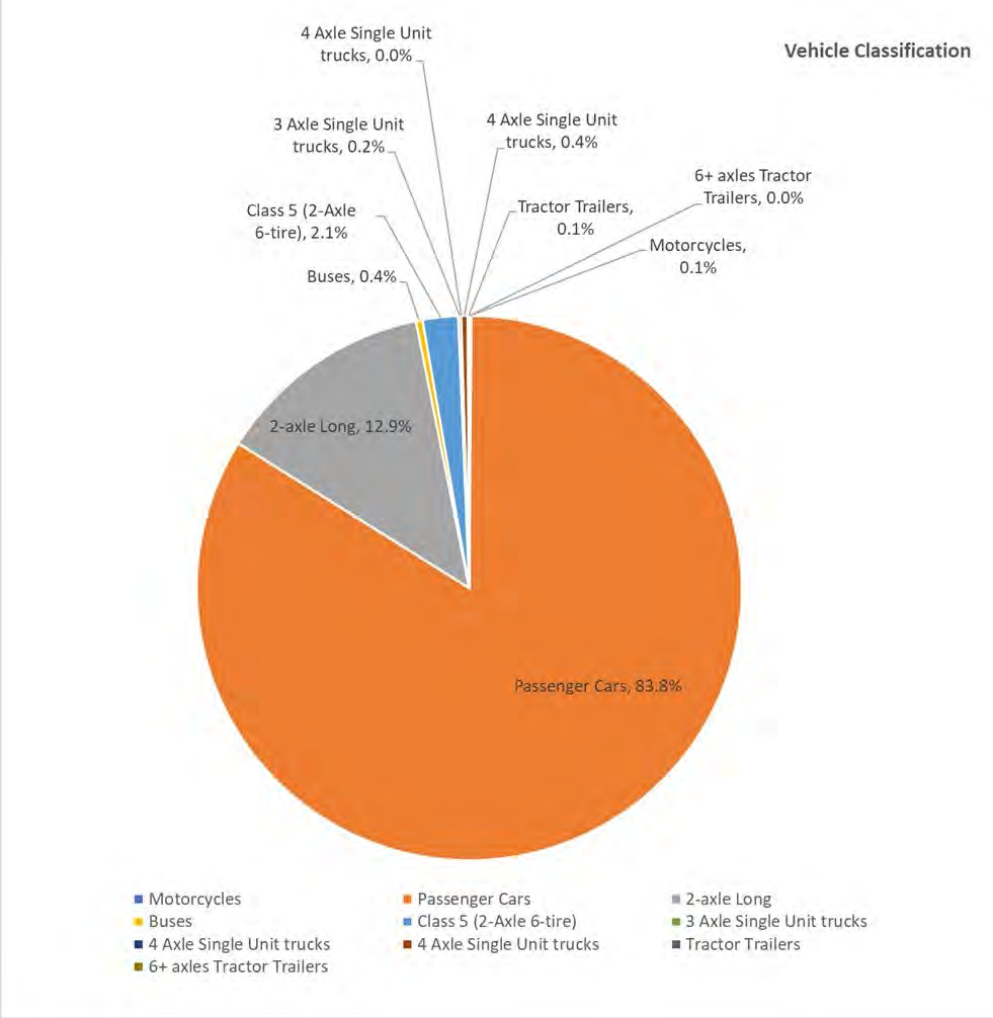

Figure 14: Vehicle Classification along Jumpers Hole Road

4.7 Existing Intersection Count data and Capacity Analysis

Traffic Counts were originally conducted in 2016. In October 2021, 4 new traffic counts were performed at:

- Jumpers Hole Road at Evening Star Drive
- Jumpers Hole Road at the Walmart Signal
- MD 2 at Wishing Rock Road
- Evening Star Drive at Twilight Way

Recent historical counts were obtained from MDOT SHA for Jumpers Hole Road at MD 2 and for Jumpers Hole Road at MD 177. 2016 counts for Jumpers Hole Road at Woodholme North and South were applied to all analyses, as they were assumed to be similar in 2021; half-hour peak period spot counts were conducted at these two intersections and confirmed this assumption:

- Peak hour Volumes in AM from Woodholme Circle (N & S): 3 in and 12 out in 30 minutes (6 ingress, 24 egress extrapolated); this compares to 11 ingress and 31 egress in prior study.
- Peak hour Volumes in PM from Woodholme Circle (N & S) 14 in and 11 out in 30 minutes (28 ingress, 22 egress extrapolated); this compares to 35 ingress and 29 egress in prior study.

Figure 15 and Figure 16 summarize the AM and PM Peak hour traffic counts, respectively.

Figure 15: AM Peak Hour Existing Traffic Volumes

Figure 16: PM Peak Hour Existing Traffic Volumes

Appendix C has the raw traffic count data for all intersection counts and for the 48-hour volume/speed/classification count.

Weekday AM and PM peak-period traffic counts were inputted in a traffic model to analyze the existing traffic conditions[5]. These volumes were entered into a validated Synchro™ traffic software model, whose imbedded Highway Capacity Manual (HCM) methodology was then used to analyze existing intersection capacity. Performance measures of effectiveness include level of service (LOS), volume-to-capacity (v/c) ratio, and average vehicle delay. Table 4 summarizes the HCM analysis results for the existing conditions.

The results of the existing conditions capacity analysis indicate that the intersection at MD 2 and Jumpers Hole Road has a Level of Service E in the PM peak hour, which is below acceptable conditions per typical County practices. Field observations verified lengthy queues along southbound Jumpers Hole Road approaching MD 2 in peak hours along with multiple instances where not all vehicles cleared the

[5] Evening Star at Twilight Way was collected for informational purposes only and *not* utilized in the traffic model, as there is unlikely to be any modifications to that intersection.

intersection during a given signal cycle. Additionally, along the two-way stop-controlled intersections, many of the movements from the stop-controlled neighborhood side streets onto Jumpers Hole Road also had a failing Level of Service F (red); note that when County engineers evaluate two-way stop-controlled intersections, side street level of service is a critical factor. Finally, approaches that have a level of service E are shown in orange.

Table 4: Existing Intersection Capacity Analysis Results

ID	Intersection	Approach	Movement	Existing Conditions AM (PM)			
				Delay	LOS	V/C	95th Q Length (ft)
1	Jumpers Hole Rd & MD 177 (Mountain Rd)	**Control Type**		**Signal**			
		Overall		**28.0 (38.0)**	**C (D)**	**0.58 (0.70)**	**- (-)**
		Eastbound	left	20.3 (20.8)	C (C)	0.32 (0.42)	70 **(330)**
			through-right	25.7 (38.9)	C (D)	0.29 (0.76)	160 (510)
		Westbound	left	15.8 (32.9)	B (C)	0.42 (0.66)	145 (220)
			through	26.9 (24.1)	C (C)	0.59 (0.30)	255 (180)
			right	20.5 (21.7)	C (C)	0.12 (0.10)	0 (5)
		Northbound	left	27.4 (38.6)	C (D)	0.51 (0.55)	155 (160)
			through	33.2 (49.8)	C (D)	0.15 (0.53)	80 (190)
			right	32.4 (46.6)	C (D)	0.07 (0.27)	0 (220)
		Southbound	left	28.6 (36.2)	C (D)	0.23 (0.55)	100 (190)
			through	42.7 (53.8)	D (D)	0.62 (0.67)	240 (280)
			right	35.4 (43.6)	D (D)	0.14 (0.13)	0 (75)
2	Jumpers Hole Rd & Ashberry Ln/Evening Star Dr	**Control Type**		**Stop (2-Way)**			
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**
		Eastbound	left-through-right	22.7 (293.2)	**C (F)**	0.26 (1.04)	50 (160)
		Westbound	left-through-right	28.0 (279.0)	**D (F)**	0.43 (1.24)	75 (435)
		Northbound	left-through-right	0.1 (0.4)	A (A)	0.00 (0.02)	15 (120)
		Southbound	through	0.7 (2.9)	A (A)	0.03 (0.10)	80 (430)
			right	0.0 (0.0)	A (A)	0.00 (0.01)	0 (80)
3	Jumpers Hole Rd & Woodholme Circle (N)	**Control Type**		**Stop (2-Way)**			
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**
		Eastbound	left-through-right	19.4 (127.1)	**C (F)**	0.03 (0.06)	35 (15)
		Westbound	left-through-right	18.7 (64.7)	**C (F)**	0.02 (0.14)	15 (65)
		Northbound	left-through-right	0.2 (0.1)	A (A)	0.00 (0.00)	40 (165)
		Southbound	left-through-right	0.0 (0.2)	A (A)	0.00 (0.01)	15 (140)
4	Jumpers Hole Rd & Woodholme Circle (S)	**Control Type**		**Stop (2-Way)**			
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**
		Eastbound	left-through-right	14.7 (41.0)	B (E)	0.03 (0.07)	25 (45)
		Westbound	left-through-right	15.6 (81.7)	**C (F)**	0.02 (0.10)	30 (30)
		Northbound	left-through-right	0.2 (0.2)	A (A)	0.00 (0.01)	20 (140)
		Southbound	left-through-right	0.0 (0.3)	A (A)	0.00 (0.01)	115 (340)
5	Jumpers Hole Rd & Walmart Dwy (N)	**Control Type**		**Signal**			
		Overall		**8.1 (17.0)**	**A (B)**	**0.46 (0.66)**	**- (-)**
		Eastbound	left-through-right	41.4 (40.0)	D (D)	0.25 (0.22)	60 (105)
		Westbound	left	42.0 (43.1)	D (D)	0.31 (0.50)	45 **(115)**
			through	39.3 (38.7)	D (D)	0.02 (0.05)	15 (90)
			right	39.5 (39.0)	D (D)	0.03 (0.09)	50 **(105)**
		Northbound	left	4.2 (7.1)	A (A)	0.01 (0.03)	20 (60)
			through-right	5.7 (18.1)	A (B)	0.23 (0.73)	125 (470)
		Southbound	left	1.8 (10.8)	A (B)	0.11 (0.44)	**160 (225)**
			through-right	4.5 (6.4)	A (A)	0.48 (0.49)	**385 (500)**
6	Jumpers Hole Rd & MD2 (Gov Ritchie Hwy)/MD 2 (Gov Ritchie Hwy)	**Control Type**		**Signal**			
		Overall		**50.9 (76.7)**	**D (E)**	**0.68 (0.85)**	**- (-)**
		Eastbound	left	63.3 (84.0)	**E (F)**	0.52 (0.87)	90 **(620)**
			through	50.1 (57.1)	D (E)	0.35 (0.52)	100 (500)
			right	48.1 (52.5)	D (D)	0.13 (0.25)	30 (95)
		Westbound	left	63.6 (91.2)	**E (F)**	0.56 (0.77)	95 (255)
			through	53.0 (73.6)	D (E)	0.61 (0.66)	130 (175)
			right	45.9 (64.7)	D (E)	0.04 (0.11)	0 (30)
		Northbound	left	58.3 (108.2)	**E (F)**	0.72 (0.96)	200 **(1965)**
			left-through	58.5 (119.6)	**E (F)**	0.72 (1.00)	295 **(1990)**
			right	43.6 (57.2)	D (E)	0.05 (0.06)	0 **(1125)**
			through	- (-)	- (-)	- (-)	- (-)
		Southbound	left	36.0 (61.1)	D (E)	0.26 (0.37)	160 **(205)**
			left-through	46.5 (84.6)	**D (F)**	0.71 (0.85)	590 **(750)**
			right	34.0 (57.3)	C (E)	0.10 (0.14)	255 (255)
			through	- (-)	- (-)	- (-)	- (-)
7	MD2 (Gov Ritchie Hwy) & Patriots Plz Dwy	**Control Type**		**Stop (T Int)**			
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**
		Eastbound	left	8.9 (9.8)	A (A)	0.05 (0.07)	50 (50)
			through	0.0 (0.0)	A (A)	0.13 (0.30)	0 (10)
		Westbound	through-right	0.0 (0.0)	A (A)	0.21 (0.25)	10 (10)
		Southbound	right	9.1 (9.0)	A (A)	0.11 (0.07)	0 (0)
8	MD 2 (Gov Ritchie Hwy) & Wishing Rock Rd	**Control Type**		**Stop (T Int)**			
		Overall		**- (-)**	**- (-)**	**- (-)**	**- (-)**
		Eastbound	through	0.0 (0.0)	A (A)	0.11 (0.20)	0 (0)
		Westbound	through	0.0 (0.0)	A (A)	0.16 (0.30)	0 (0)
			right	0.0 (0.0)	A (A)	0.01 (0.00)	0 (0)
		Southbound	right	10.1 (12.2)	B (B)	0.02 (0.02)	25 (25)

5.0 INTERIM RECOMMENDATIONS AND EVALUATION METRICS

5.1 Evaluating Potential Alternatives

When developing and evaluating different alternatives to improve the corridor and address the study's purpose and need, the County considered the following performance metrics:

1. *Creation of new gaps in Jumpers Hole Road traffic for side street access:* The ability for an alternative to produce new gaps was tested using Synchro™ traffic modeling software – the same software that local and State agencies use to time traffic signals. After an existing conditions model was developed for the corridor – and validated through onsite observations – this traffic model was modified to represent each alternative tested. While the software does not specifically report the number of available gaps in traffic for side street motorists, it *does* specify the *maximum* number of vehicles that *can* egress onto the main road given the sum availability of gaps within a peak hour period. Accordingly, the quantifiable data that is reported and compared will be the AM (PM) maximum number of cars that can potentially get out onto Jumpers Hole Road in an hour from each side street. Again, this is not the number of gaps in an hour, since one or *multiple* cars can egress during any given gap in traffic. This egress number can then further be supported by comparing the change in vehicle delay experienced by side street vehicles between existing conditions and proposed conditions. For example, if more cars are being reported as being able to egress under a tested alternative, then to confirm this, the average delay experienced by these side street motorists would be expected to decrease.
2. *Improvements to connectivity of the existing pedestrian and bike infrastructure*: This is a qualitative measure, where the pedestrian/bike infrastructure generally improves with facility width, buffer distance from vehicle travel lane, and vertical separation from vehicular travel lanes.
3. *Change in travel time through corridor:* This will be reported as the change in travel time along the corridor for each alternative, relative to existing conditions, in the AM (PM) peak hours.
4. *Need for right of way:* This will be reported as the amount of right-of-way in square feet need for an easement/take of private property.
5. Traffic calming / expected reduction in speeding: This will be reported, qualitatively, as expected changes to average speed based on known and documented traffic calming solutions.
6. *Reducing truck throughput:* Because there are already some truck prohibitions, and the existing trucks represent a very low percentage, it is difficult to estimate the impact of additional signage on changes in the number of expected trucks. However, traffic calming solutions could also limit the number of expected trucks using Jumpers Hole Road as a shortcut.
7. *Planning-level constructions costs:* This will be reported as a high-level construction cost estimate to design and to build each alternative, taking into account any right-of-way needs, utility relocation, and other factors that can have outsized impacts on construction costs. Note that these costs are subject to significant changes based on the final design of the project.
8. *Traffic Impacts:* This will be reported as changes in delay (in seconds) experienced by the average vehicle on a given intersection approach, as well as changes to the 95th % queue length for each AM (PM) peak hour along each approach. These metrics are reported by the traffic modeling software.

5.2 Alternatives

Options were developed to primarily increase egress opportunities for side streets, as well as to close gaps in the pedestrian and bicycle network. Additionally, these recommendations address traffic calming (in order to reduce speeds to mitigate the run-off-the-road crashes and increase pedestrian/bike safety), while maintaining only the existing two travel lanes. While no individual improvement alone will address the complete purpose and need, the following potential solutions were examined individually to evaluate how well they perform within the context of the defined metrics of the prior section:

1. All-way stop control at Evening Star Drive and Jumpers Hole Road
    a. This option includes short northbound and southbound left turn bays along Jumpers Hole Road.
2. Roundabout control at Evening Star Drive and Jumpers Hole Road.
3. Signalization of Evening Star Drive at Jumpers Hole Road.
    a. This option included a new crosswalk along north leg.
    b. Coordinate signal with Walmart signal such that both are red along Jumpers Hole Road at the same time in order to create gaps in Jumpers Hole Road traffic.
    c. Optional new northbound and southbound left turn bays along Jumpers Hole Road.
4. New roadway connections to provide alternate access opportunities along the Jumpers Hole Road corridor.
    a. Perth Road connection Patriots Plaza.
    b. Woodholme Circle (N) link connection to Evening Star Drive.
    c. Woodholme Circle (N) connection to Ashberry Lane.
5. New striped bike lanes along Jumpers Hole Road
    a. In a short-term option, these bike lanes would take the place of existing 4’ shoulders along Jumpers Hole Road. Note that 4’ bike lanes are generally sub-optimal with respect to County and State guidelines for bike lane width.
    b. A long-term option would widen the roadbed to add pavement width for standard-width bike lanes.
6. New sidewalk and/or side path along Jumpers Hole Road.
7. Increased truck prohibitions.
8. Optional traffic capacity improvements along the southern portion of Jumpers Hole Road.

5.2.1 *All-way Stop Control at Evening Star Drive*

All-way stop control was evaluated at the Evening Star / Jumpers Hole Road intersection. As shown in Figure 17, new southbound and northbound left turn bays were included along Jumpers Hole Road to aid in congestion management. Additionally, potential pedestrian/bike improvements were overlaid to show how they can fit in with the overall alternative.

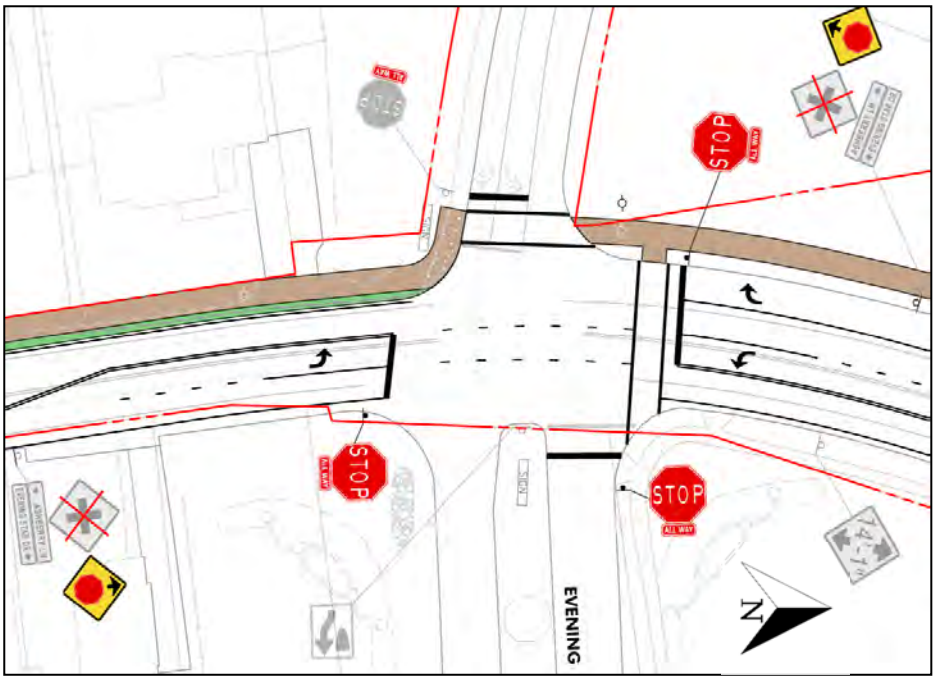

Figure 17: Option for all-way stop control at Evening Star Dr / Jumpers Hole Road

The existing conditions traffic model was modified to replace the two-way stop-controlled intersection of Evening Star Drive at Jumpers Hole Road with an all-way stop control. Evaluating the referenced performance metrics for the all-way stop condition in comparison to existing conditions shows the following results:

- Gap Creation:
  - The all-way stop control condition would benefit motorists on Evening Star Drive and Ashberry Lane by providing controlled dedicated access to Jumpers Hole Road. However, Woodholme Circle (N) and (S) motorists would see no improvement in their ability to egress on to Jumpers Hole Road.
- Pedestrian/bike connectivity:
  - The all-way stop control condition provides a dedicated crossing opportunity for all legs of the Evening Star / Jumpers Hole Road intersection.
- Change in corridor travel time
  - Minimal increases in AM peak hour travel time. Large increases in PM travel time. The larger increases in PM travel time are related to the larger volumes on Jumpers Hole Road in the afternoon versus the morning commuting hour. Another reason for the relatively modest increase in southbound Jumpers Hole Road travel time is because the all-way stop control serves to *meter* traffic heading south toward the Walmart signal – this prevents long southbound queues from building up and spilling back toward Woodholme Circle.
- Right of Way needs
  - None
- Traffic Calming:

  - Because all Jumpers Hole Road vehicles are required to stop at the all-way stop control, speeding through the residential segment of Jumpers Hole Road is expected to be substantially reduced.
- Truck Traffic impacts
  - Potential decrease in truck traffic due to increase corridor travel time.
- Planning-level Costs
  - $5,000 for stop control signage and re-striping Jumpers Hole Road for turn bays.
- Traffic Impacts:
  - As noted previously, travel times in the PM peak hour will be longer based on traffic modeling of the all-way stop control condition at Jumpers Hole Road / Evening Star Drive. Additionally, traffic modeling showing longer northbound Jumpers Hole Road queues, extending back from Jumpers Hole Road in the PM peak hour time frame. These queues block Woodholme Circle (N) and (S).
  - While residents along Evening Star Drive and Ashberry Lane would see substantially reduced delay, Woodholme residents would not see any improvement along Woodholme Circle (N) and (S).

5.2.2 *Signal at Evening Star Drive*

A full traffic signal was evaluated at the Evening Star / Jumpers Hole Road intersection. As shown in Figure 18, southbound and northbound left turn bays were also included along Jumpers Hole Road to aid in congestion management. Additionally, the existing southbound right turn lane on Jumpers Hole Road is shown as remaining, however, this turn lane may be a candidate for removal if the traffic volumes don't support it. Finally, potential pedestrian/bike improvements were overlaid to show how they can fit in with this overall alternative. Also, no changes to side street lane configurations were assumed for this concept.

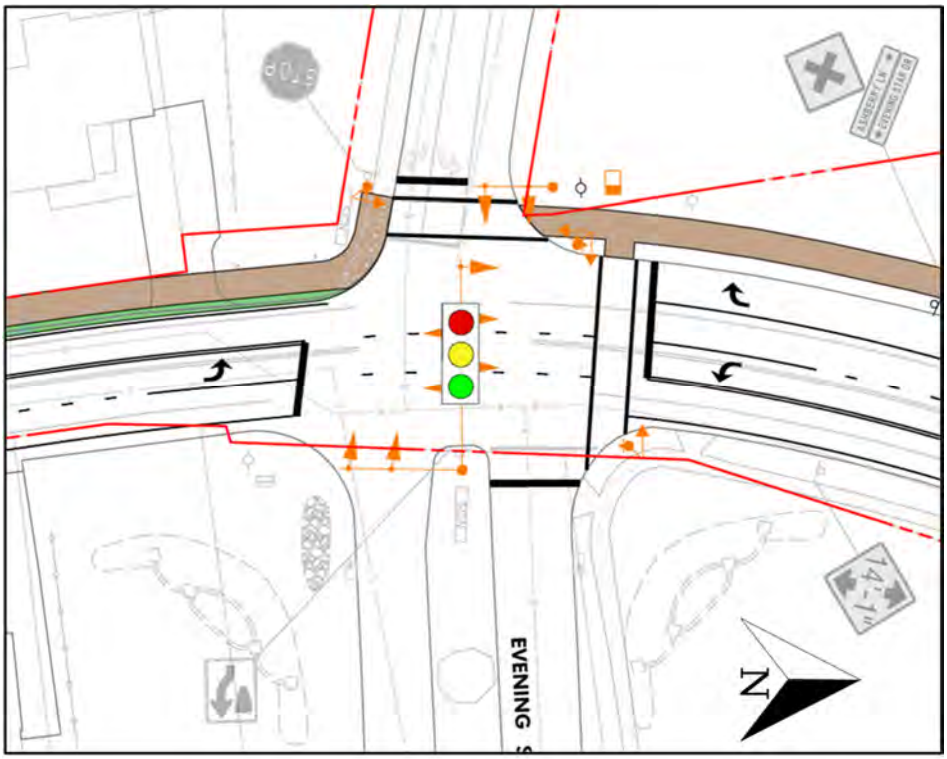

Figure 18: Potential Signal at Jumpers Hole Road / Evening Star Drive

The intersection of Evening Star was preferred for signalization over both Woodholme Cir (N) or (S) due to it having larger side street volumes, as well as being sufficiently far from the existing signal at the Walmart entrance. The existing conditions traffic model was modified to replace the two-way stop-controlled intersection of Evening Star Drive at Jumpers Hole Road with full traffic signal; this signal was modeled to be timed with a similar cycle length to the Walmart Signal and coordinated with it such, that both signals are red along Jumpers Hole Road at the same time, to induce gaps along Jumpers Hole Road. Evaluating the referenced performance metrics for the signalized traffic condition in comparison to existing conditions shows the following results:

- Gap Creation:
    - The full signal control condition would benefit motorists on Evening Star Drive and Ashberry Lane by providing controlled dedicated access to Jumpers Hole Road. Additionally, the signal would provide an increased number of opportunities for residents along Woodholme Circle (N) and (S) to egress onto Jumpers Hole Road. Traffic modeling (assuming simultaneous red lights along Jumpers Hole Road at Evening Star and at Walmart) show that gaps increase such that motorists have more than double the opportunities to egress onto Jumpers Hole Road over existing conditions.
- Pedestrian/bike connectivity:
    - The all-way stop control condition provides a dedicated crossing opportunity for all legs of the Evening Star / Jumpers Hole Road intersection.
- Change in corridor travel time
    - In the AM peak hour, the travel time differences are negligible; in the PM peak hour, the travel time is dependent on the northbound and southbound left turn bays proposed

along Jumpers Hole Road. Absent these turn bays, travel time along the corridor increases 30 seconds; but with these turn bays, travel time *decreases* by about 30 seconds.

- Right of Way needs
  - Minimal to none, depending on design and location of signal equipment.
- Traffic Calming:
  - Because mainline Jumpers Hole Road vehicles are required to stop during the red phase of proposed signal, average vehicle speeds through the residential segment of Jumpers Hole Road are expected to be reduced.
- Truck Traffic impacts
  - None anticipated.
- Planning-level Costs
  - $250,000 to $275,000
- Traffic Impacts:
  - Improvements in side street delay
  - No degradation in Jumpers Hole Road queue lengths.

As part of this recommendation, the Anne Arundel County Department of Public Works requested an updated traffic signal warrant analysis be conducted at the intersection of Jumpers Hole Road and Ashberry Lane/Evening Star Drive. A prior signal warrant analysis conducted in July of 2017 found that the signal was not warranted, based on insufficient side street volume. However, additional development along Evening Star Drive in subsequent years has resulted in increased traffic volumes and the degradation of traffic operations on the stop-controlled side-street approaches at the intersection with Jumpers Hole Road. The purpose of this analysis is to reassess the latest intersection volumes and safety history to determine if signalization of the intersection is now warranted.

Recent traffic data, including turning movement counts, pedestrian counts, speed data, and crash data were collected in November 2021 and evaluated in the study. The study was performed in accordance with the most recent (2011) version of the Maryland Manual on Uniform Traffic Control Devices (MdMUTCD).

Currently, the intersection of Jumpers Hole Road at Ashberry Lane/Evening Star Drive now meets three (3) of the nine (9) signal warrants, satisfying the minimum requirements for a traffic signal. According to the MdMUTCD, the satisfaction of a traffic signal warrant or warrants shall not, in itself, require the installation of a traffic control signal. If a traffic signal were to be pursued at Evening Star Drive, the full signal warrant report, located in Appendix D, has additional details related to potential signal phasing and timing.

5.2.3 *Roundabout at Evening Star & mini roundabout at Woodholme (S)*

A single lane roundabout was modeled in Sidra™ traffic software[6] to determine how it accommodates both mainline Jumpers Hole Road traffic and side street traffic, as well as the impacts are on downstream intersections. Figure 19 below shows the proposed roundabout configuration – a full

[6] Sidra is industry-standard software used for modeling traffic circles and roundabouts

single-lane roundabout at Evening Star Drive, with a mini-roundabout to the south at Woodholme Cir (S). Note, that without mini-roundabout at Woodholme Cir (S), the full roundabout at Evening Star does not improve accessibility to Jumpers Hole Road for Woodholme residents.

Figure 19: Potential full roundabout at Evening Star with mini-roundabout at Woodholme (S)

Evaluating the referenced performance metrics for the roundabout condition in comparison to existing conditions shows the following results:

- Gap Creation:
  - The roundabout control for Evening Star Drive and for Woodholme Cir (S) result in substantial improvement to accessibility. Woodholme Cir (N) does not see improvements in ability to egress on to Jumpers Hole Road.
- Pedestrian/bike connectivity:
  - The roundabouts by themselves do not provide dedicated roadway crossings to pedestrians or cyclists, but they do substantially reduce speeds at the intersection, making crossing of Jumpers Hole Road safer than existing conditions.
  - Note, the large footprint that the full roundabout at Evening Star Drive requires makes installing sidewalks and side paths along Jumpers Hole Road costlier and requires additional private right-of-way.
- Change in corridor travel time
  - The corridor travel time is generally the same as existing conditions in both northbound and southbound directions
- Right of Way needs
  - Minor right-of-way needs that are largely HOA property.
  - With the inclusion of sidewalks/side paths, right-of-way needs increase.
- Traffic Calming:
  - The average speed through the residential portion of the corridor decreases.
- Truck Traffic impacts:
  - Not likely to deter any truck traffic due to the negligible changes in corridor travel time.
- Planning-level Costs:
  - $500,000
- Traffic Impacts:
  - Side street delay is substantially reduced

- Minor queuing increases along southbound Jumpers Hole Road between the mini-roundabout and the Walmart signal.

5.3 New roadway connections adjacent to Jumpers Hole Road

The Woodholme neighborhood has access to the larger regional highway network only through direct connection from Jumpers Hole Road, while other neighborhoods – like Creekstone Village and Ashberry have ancillary connections (through the Twilight Way / shopping center and from MD 2, respectively). Increasing the grid network of roadways around the Jumpers Hole Road corridor increases the ability to access the regional highway network without depending solely on Jumpers Hole Road. This also has the additional benefit of relieving some congestion along the Jumpers Hole Road corridor. The following figures show three potential examples of future roadway connections:

- *Figure 20:* Connection between Perth/Woodholme Circle (S) and Patriots Plaza. This roadway would provide a direct connect to MD 2 northbound and southbound, bypassing Jumpers Hole Road entirely, but would only assist Woodholme residents west of Jumpers Hole Road. It would also allow for direct access to the west side of Woodholme from MD 2, again bypassing Jumpers Hole Road.

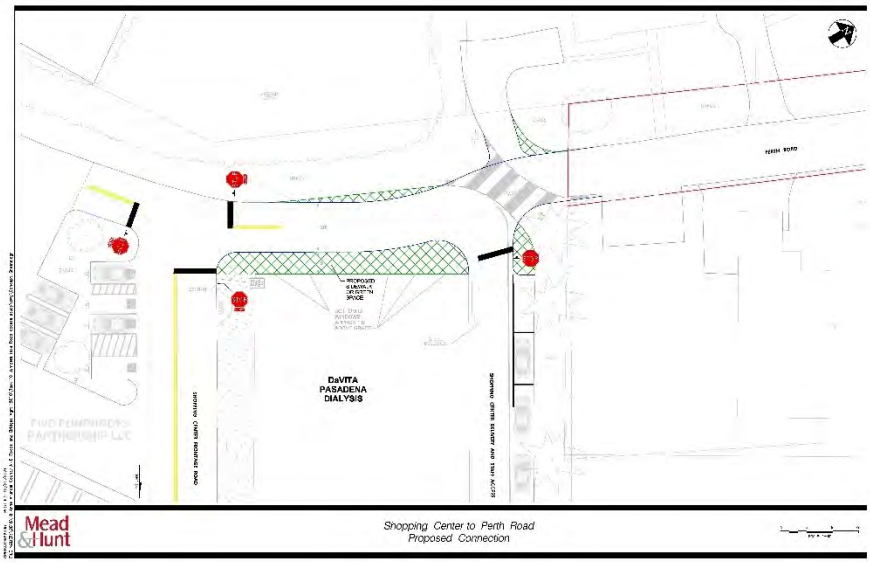

Figure 20: Potential connection between Perth/Woodholme Circle (S) and Patriots Plaza

- *Figure 21:* Connection between Perth/Woodholme Circle (N) and Ashberry Lane. This roadway would provide a direct connection to Ashberry Lane, which by itself, does little to improve accessibility to and from the larger roadway network. However, combined with a potential traffic signal at Ashberry/Jumpers Hole Road, would enhance residents' ability to egress Woodholme safely for residents west of Jumpers Hole Road. Note that this connection is proposed as a one-way connection outbound only from the Woodholme neighborhood.

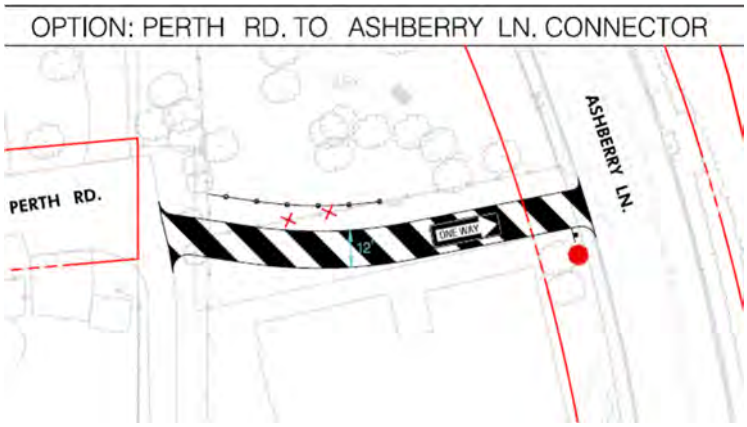

Figure 21: Potential connection between Perth/Woodholme Circle (N) to Ashberry

- *Figure 22:* Connection between Perth/Woodholme Circle (N) and Evening Star Drive. This roadway would provide a direct connection to Evening Star Drive, which does little to improve accessibility to and from the larger roadway network. However, combined with a potential traffic signal at Evening Star/Jumpers Hole Road, would enhance residents' ability to egress Woodholme safely for resident east of Jumpers Hole Road. Note that this connection is proposed as a one-way connection outbound only from the Woodholme neighborhood.

Figure 22: Potential connection between Woodholme Circle (N) to Evening Star

Evaluating the referenced performance metrics for installing new road connections, in comparison to existing conditions, shows the following results:

- Gap Creation:
  - By themselves, these roadway connections provide limited ability to improve ability to egress onto Jumpers Hole Road. Combining the connections from Woodholme Cir (N) to Ashberry and/or Evening Star Drive with an all-way stop-control or a traffic signal at Jumpers Hole Road / Ashberry would greatly enhance the ability of Woodholme residents to safely egress on to Jumpers Hole Road.
- Pedestrian/bike connectivity:
  - No improvements to pedestrian and bike infrastructure connectivity.
- Change in corridor travel time:
  - Negligible improvement in travel times expected.
- Right of Way needs:

  - Considerable right-of-way is needed, as all proposed connections are on HOA/private property.
- Traffic Calming:
  - No changes to average corridor speeds expected.
- Truck Traffic impacts
  - No impacts to truck traffic expected.
- Planning-level Costs
  - Perth Road connection: ~$50,000.
  - Evening Star connection: ~$200,000.
  - Ashberry Lane connection: ~$200,000.
- Traffic Impacts:
  - The connections by themselves are not expected to alter overall side street wait times for Woodholme residents. In combination with an all-way stop control or traffic signal at Ashberry Lane/Jumpers Hole Road, residents of Creekstone Village, Ashberry, and Woodholme will all see major reductions in delay accessing Jumpers Hole Road.

5.4 Bike Lanes along Jumpers Hole Road

For this alternative, short-term re-striping of the Jumpers Hole Road corridor is considered, wherein the existing 4-foot shoulders are repurposed for bike lanes, while the existing travel lanes will remain as is. Signing for bikes lanes is also proposed under this alternative. Four feet wide bike lanes are only proposed as a short-term alternative given that five feet is the most-common standard bike lane minimum width recommended. Additionally, given the high traffic volumes along Jumpers Hole Road, wider and/or buffered bike lanes would be a preferred on-street option. However, these changes would require full reconstruction of Jumpers Hole Road. Evaluating the referenced performance metrics for installing on-street bike lanes in comparison to existing conditions shows the following results:

Figure 23: Rendering of alternative that shows existing shoulders repurposed as bike lanes

- Gap Creation:
  - No change in gaps for improving side street access is expected.
- Pedestrian/bike connectivity:
  - Bike connectivity is modestly improved with on-street bike lanes, however, it likely that the proposed facilities would be used by only a small subset of potential riders due to the lack of vertical and horizontal separation from vehicle traffic. Additionally, the pedestrian would be put into conflict with cyclists, since walkers currently use the shoulders along Jumpers Hole Road to access the commercial area at the southern end of the study area.
- Change in corridor travel time
  - No change in travel time is expected.
- Right of Way needs

- Not applicable.

- Traffic Calming:
  - Potential for bike lane markings to provide some degree of vehicle traffic calming, even though the travel lanes are not expected to be narrowed in this option.
- Truck Traffic impacts
  - Not applicable.
- Planning-level Costs
  - $5,000 – primarily for new signage and bike lane markings
- Traffic Impacts:
  - No impacts to traffic anticipated.

5.5 Sidewalk and Side Path along Jumpers Hole Road

Jumpers Hole Road has a public right-of-way that varies in available width from the north end of the segment to the southern end, with the middle of the corridor (near Woodholme Circle) having the narrowest right-of-way at about 40 feet (see Figure 24). Even with a narrow right-of-way, there is sufficient space for a sidewalk, side path, and a grass buffer (for street signs and for mailboxes) – or some combination therein.

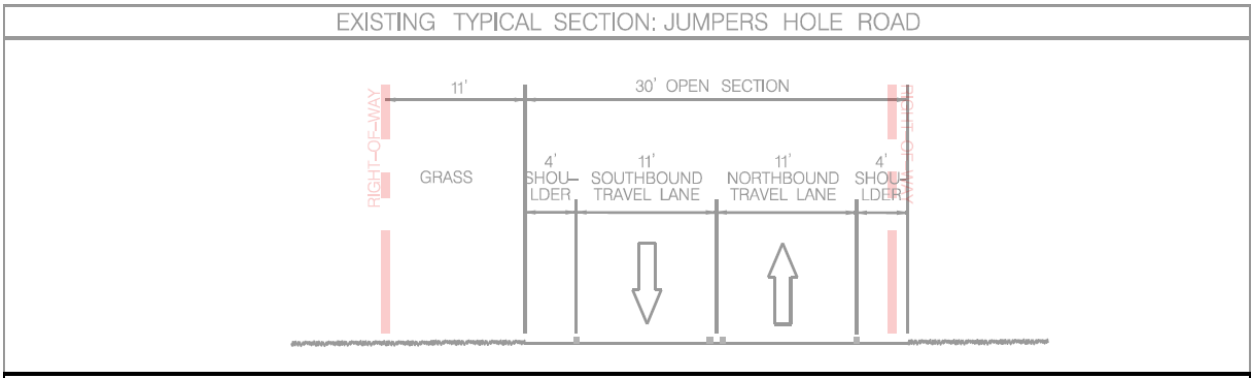

Figure 24: Narrowest Public Right of War along Jumpers Hole Road Corridor

Note that since the public right-of-way line is in close proximity to the eastern road edge, fitting sidewalk or any other pedestrian/bike infrastructure on the east side would likely require repurposing the roadbed dedicated to shoulder space *and* shifting the main travel lanes westward. In the context of providing both a sidewalk and a side path on opposite sides of the roadway, there are many different potential cross sections - depending on path width, sidewalk width, buffer width, retaining the shoulder(s), among other factors. Additionally, it is also possible that the sidewalk and the side path can be constructed in phases, with the path first and then the sidewalk later (if private right-of-way is needed), for example. Figure 25 and Figure 26 show two potential options for installing a side path and or side path/sidewalk combination along Jumpers Hole Road.

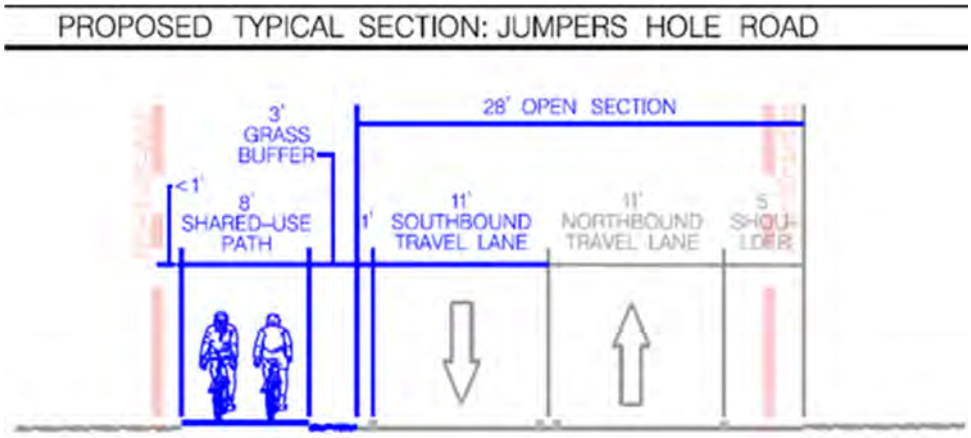

Figure 25: Typical section showing an example of shared use path through Woodholme

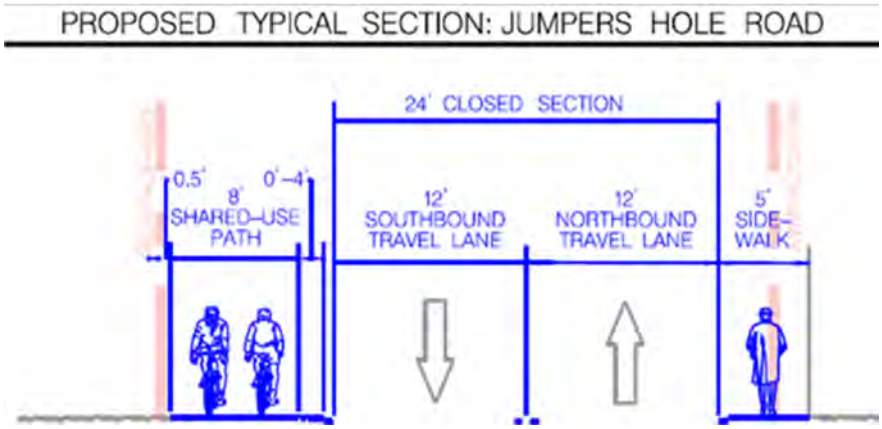

Figure 26: Typical section showing a shared use path and sidewalk through Woodholme

For the purpose of testing the effectiveness of this alternative, the report presumes that both a sidewalk and side path are the desired long-term outcome. Evaluating the referenced performance metrics for installing sidewalk and side paths shows the following results:

- Gap Creation:
  - No change in gaps for improving side street access is expected.
- Pedestrian/bike connectivity:
  - Bike connectivity is improved, as a wide side path provides a comfortable and safer ride for a large subset of cyclists. Pedestrian and bike safety is further improved if the side path is constructed behind a curb and gutter. Additionally, providing a sidewalk on the other side of the road from the side path completes the street – allowing walkers on both sides to access to and from the commercial area of the corridor.

Figure 27: Rendering that shows Jumpers Hole Rd with a side path & sidewalk

- Change in corridor travel time:
  - No expected change in overall corridor travel time.
- Right of Way needs:
  - The right-of-way needs will ultimately depend on the final design of the project and what roadway features will be retained. Also, more critically, the right-of-way needs will be predicated on the ability of shifting the general-purpose travel lanes westward so that the future roadway centerline is more closely-aligned with the center of the public right-of-way.
- Traffic Calming:
  - If the final design results in narrower travel lanes and/or loss of shoulders, then a reduction in average speeds is anticipated. Even if travel lanes are not narrowed, additional pedestrians along the corridor can also have a traffic calming effect.
- Truck Traffic impacts
  - Not applicable.
- Planning -level Costs
  - Expected cost is about $400,000 to $700,000, depending selected design (e.g., grade separated, repurpose existing shoulders, etc.).
- Traffic Impacts:
  - No impacts to traffic anticipated.

5.6 Enhanced Truck Prohibitions along Jumpers Hole Road

Given that about 0.5% of all vehicles are larger than a box truck, further prohibitions will show limited reductions in the number of overall vehicles in the corridor. For example, the current average daily traffic is about 20,000 cars per day, meaning that about 100 vehicles per day are larger than a box truck; and this represents the maximum number of vehicle reduction through the neighborhoods – with 100% compliance to any increased truck prohibition signage.

Evaluating the referenced performance metrics for implementing truck restrictions, in comparison to existing conditions, shows the following results, assuming a level of 100% compliance:

- Gap Creation:
  - Very modest change in overall volumes through the corridor; accordingly, no change in gaps expected in comparison to current conditions.
- Pedestrian/bike connectivity:
  - No improvements to biking or walking infrastructure
- Change in corridor travel time
  - Very modest change in overall volumes through the corridor; accordingly, no corridor travel times expected in comparison to current conditions.
- Right of Way needs
  - Not Applicable.
- Traffic calming:
  - No average speed reduction expected.
- Truck traffic impacts:
  - With 100% compliance, maximum expected reduction of trucks is 100 trucks per day.

- Planning-level Costs
  - $1000, primarily for signage.
- Traffic Impacts:
  - No impacts to queuing or delay to mainline Jumpers Hole Road or side street traffic.

5.7 Optional Traffic Improvements

While improving congestion was not identified, as a primary driver of this feasibility study, several community comments – as well as field observations – noted periods of heavy congestion in the southern portion of the corridor, between MD 2 and the Walmart signal. Several operational improvements, both short- and long-term, were noted that could increase the overall capacity of this segment, improving its overall efficiency. Note, that traffic improvements should be considered carefully and address only improvements that impact egress to and from the southern commercial portion of the segment - that represents a high generator of traffic. Improvements in this area can help relieve the congestion felt further north in the residential portion of the corridor without having to rely on extra turn lanes or additional through travel lanes. To address some of the congestion, short-term and long-term recommendations were developed. Both short-term and long-term improvements can coincide with the recommended alternative(s) in this report.

- Short-Term Improvements:
  - Add a pedestrian signal and crosswalk at the Walmart signal. This will provide walkers from the west side of Jumpers Hole Road a dedicated crossing to the commercial area on the east side.
  - Repurpose the northbound left-turn lane at the Walmart signalized entrance as a southbound through receiving lane – allowing Jumpers Hole Road to have two receiving lanes south of the Walmart signal, freeing up unused capacity, as the northbound left turns were minimal. This improvement will also help with Walmart egress to southbound MD 2.
  - Consider a southbound protected left turn lag phase at the Walmart signal, as opposed a leading phase.
- Long-Term Improvements:
  - Provide a new northbound right-turn lane along Jumpers Hole Road between MD 2 and the unsignalized driveway into the Walmart complex.
  - Reconfigure the intersection at the unsignalized Walmart driveway to allow right-only egress and prevent left turns onto southbound Jumpers Hole Road.
  - Geometric and/or traffic signal improvements to the MD 2 at Jumpers Hole Road intersection. Options include removing the split phasing, shortening the cycle length or providing additional turn bays.

Figure 28 highlights some of these short- and long-term improvements.

Figure 28: Potential short term and long-term traffic improvements

5.8 Alternatives analysis summary and preliminary recommendations

While no individual improvement alone addresses the primary purpose and need, the project team evaluated the benefits and impacts of each of the previously-discussed preliminary alternatives and developed *initial* recommendations to present publicly. These preliminary recommendations were originally grouped and presented to the local community as short term and long-term recommendations, with short term recommendations being those that could be implemented in a year's time, and long-term recommendations requiring at least one year for design and construction.

Preliminary short-term recommendations were to provide a full traffic signal (as shown in section 5.2.2) at the intersection of Evening Star Drive and Jumpers Hole Road. The intersection would be restriped to include southbound and northbound left turn pockets along Jumpers Hole Road and a pedestrian crossing on the north leg of the intersection. Finally, this traffic signal would be timed with the same cycle length as the Walmart signal and coordinated such that both would show red lights along the Jumpers Hole Road main line for 2 seconds at the same time[7]. Additional short-term improvements included a dedicated pedestrian crossing at the north leg of the Walmart signal. Finally, the northbound left turn lane into the bowling alley would be re-striped as a southbound receiving lane that transitions into the existing southbound left turn lane at MD 2.

[7] Initial recommendation was to lower the cycle length at the Walmart signal from 110 seconds to 90 seconds and then match that cycle length to the proposed signal at Evening Star Drive.

Preliminary long-term recommendations included installing a side path along the west side of the Jumpers Hole Road corridor from the Walmart Signal to MD 177. Additionally, to alleviate congestion on the southern portion of Jumpers Hole Road, installing a new northbound right turn lane was recommended between MD 2 and the unsignalized driveway for the Walmart complex.

5.8.1 *Basis for preliminary recommendations*

When evaluating potential traffic control improvements (such as a roundabout, 4-way stop, or traffic signal), the clear choice for its location was the Evening Star Drive intersection due to: 1) its distance away from the existing Walmart signal; 2) its large side street traffic volumes; and 3) its overall size and availability of space for improvements without impacting residents' properties. When evaluating a given traffic control improvement, the primary concern was being able to development a recommendation that could provide egress assistance (in the form of creating gaps in Jumpers Hole Road traffic) to both the Woodholme neighborhood and the Creekstone Village & Ashberry neighborhoods. Both the roundabout option and the signal option created gaps and made egress much easier for all neighborhoods, while the all-way stop control alternative only improved egress opportunities for Creekstone Village and Ashberry. Additionally, this latter alternative created lengthy queuing along Jumpers Hole Road. Both the signal and the roundabout would reduce speeds, with the roundabout expected to reduce speeds on a more consistent basis when compared to the signal.

From a cost perspective the roundabout would have twice the estimated construction expense as the signal and would cost substantially more to design. Also, the design time would be much longer than for a signal. Recurring maintenance costs for both a roundabout and traffic signal are generally low on an annual basis.

Looking at safety, the signal provides a dedicated pedestrian/bike crossing with a pedestrian signal and marked crosswalk. Alternatively, while the roundabout also provides a marked crossing, it requires oncoming traffic to *yield* to pedestrians – without being forced to stop by a red light. Finally, when evaluating a traffic signal and roundabout, the overall space required for each was evaluated due to the additional need to also install sidewalks and/or side paths along Jumpers Hole Road. The roundabout requires a much greater footprint than the traffic signal, such that even more private right-of-way would be needed to install any future sidewalk/side path along Jumpers Hole Road. Accordingly, the traffic signal was chosen as the primary means for providing gaps in Jumpers Hole Road traffic to allow side street access. Traffic modeling was conducted with and without left turn bays along Jumpers Hole Road; the modeling showed that short left turn bays were needed to prevent upstream queuing in northbound and southbound Jumpers Hole Road. The choice for installing a pedestrian signal and crossing along the north leg was due to the presence of sidewalk along a portion of the north side of the intersection. However, nothing precludes all legs of the intersection from having a signalized crosswalk once sidewalk or side paths are constructed.

The basis for the other preliminary recommendations – signalized crossing at Walmart and restriping the northbound left there as a southbound through lane – were based on the ability to be implemented quickly and their impact on pedestrian safety and traffic congestion, respectively.

The preliminary long-term recommendation for a side path along the west side of the Jumpers Hole Road was based on the availability of public right-of-way on that side of the corridor. This extra space allows for side path to be built that could weave around any utility poles, as needed, and still provide a grass buffer from the roadway (for street signs and mailboxes). This preliminary recommendation was for the side path to traverse the west side of the corridor from the Walmart signal to MD 177. This project was initially deemed a long-term project, because the design alone would likely take over a year even before construction takes place. Similarly, the other primary long-term recommendation was for congestion relief at the southern end of the segment, where it was observed that queues spilled back along northbound Jumpers Hole Road from the Walmart signal almost to MD 2. Providing an additional short right turn lane between MD 2 and the unsignalized driveway to the Walmart complex would allow drivers to quickly enter this turn lane without blocking traffic from behind, as the current geometry of the Walmart driveway causes the need for slow right turn maneuvers, diminishing the carry capacity of this segment of the Jumpers Hole Road corridor.

See *Appendix* F for a detailed matrix comparing all of the preliminary options across the pre-established evaluation metrics. Additionally, *Appendix G* has a comparison of standard traffic metrics and travel times for the Roundabout, all-way stop condition, and signalized option at Evening Star Drive. Appendix G also has the HCM reports and queuing reports generated by the traffic modeling software.

5.9 Public Presentation of preliminary concepts and feedback

On March 2, 2022, the County presented these preliminary concepts, including a high-level comparison of each across multiple metrics, and the initial short-term and long-term recommendations. The goal of the meeting was to solicit feedback on the initial alternatives, as well as the preliminary recommendations. This meeting was attended by representatives from Creekstone Village, Creekstone Village II**,** Woodholme Civic Association and the County Executive's Office. The County's project team included DPW, Office of Transportation, Dept. of Recreation and Parks, DPW Traffic Engineering Division, DPW Customer Relations, and MDOT-SHA. A summary of resident and agency comments is as follows:

- Some concern that connection on Perth Rd to Patriots Plaza will new induce cut-through traffic, but there was no general agreement on this.
- Some desire to see a connection from Evening Star Drive to Wishing Rock Road but no general agreement on this. *Note: Wishing Rock is also a privately held roadway.*
- Some concern that the recommended Signal at Evening Star would not work to provide gaps to Woodholme Circle residents, however, there was an overall preference for the signal. If implemented as described (where Walmart Signal and Evening Star signal are both red at the same time), there was a desire to see right turn on red restricted from the Walmart Signal. There was some desire to see the proposed connections built in parallel with the Evening Star signal. *Note: These are not mutually exclusive ideas – new connections could be provided after the signal is installed and the right of way is obtained.*
- Some residents wanted to see the traffic counts; there was a desire to see a signal warrant Analysis. *Note: Counts were conducted prior to this meeting in the Fall of 2021, and a signal warrant, while discussed earlier in report, was conducted subsequent to this meeting.*
- Concern about safety with northbound and southbound through vehicles quickly passing around queued left turning vehicles.

- General agreement for new pedestrian/bike facilities to encourage more pedestrian/bike activity, with vertically separated paths preferred over sidewalk. There was some preference for an east-side side path based on expected origin-destination walking patterns.
- There was a brief discussion about existing truck prohibitions already in place on Jumpers Hole Road. *Note: Walmart agreed to have trucks only use MD 2 for access to/from the store, but they have been observed using Jumpers Hole Road/Walmart signal.*
- Concern that since motorists exiting Walmart can't always turn left on to southbound Jumpers Hole Road due to congestion, they turn right into the residential neighborhood to find other ways to access the local highways.
- Concern that the proposed long-term recommendation for a northbound right turn lane to the unsignalized Walmart driveway would impact a sewage facility near the gas station.

5.9.1 *Additional feedback during the project duration*

In addition, due to the input directly stemming from various presentations and meetings, the County solicited and received feedback, via email, *continuously* throughout the project duration. Additional comments and questions received are shown below:

- A question was asked about how private roads intersecting with county roads are regulated.
- A representative from MDOT SHA mentioned that no specific plans were in the design stage for the intersection of MD 2 at Jumpers Hole Road.
- A suggestion was offered that the County could provide a direct trail connection of the B&A trail to Twilight Way via a new signal at MD 2 (near Wishing Rock road) that traverse behind the shopping center. This connection would bypass the need to upgrade JHR for sidewalk/path improvements.
- Comment about how Jumpers Hole Road southbound traffic backs up from Walmart signal to Woodholme Circle (S).
- A request was made for data related to the signal warrant.
- A request was made to ensure that Woodholme Circle (N) was connected to Evening Star Drive and Ashberry Lane, if a signal at Evening Star was constructed.
- A question was asked about the road classifications in the study area.
- A question was asked about potential changes to level of service at MD 2 and MD 177 intersections.
- A question was asked about why the shared use path is not proposed on the east side of Jumpers Hole Road; additionally, a question was asked about the path would impact mailboxes and stormwater grates.
- Consider median barrier(s) along Jumpers Hole Road to prevent southbound traffic from entering the unsignalized Walmart driveway.

Based on feedback from the March 2, 2022, meeting, the project team committed to the following next steps:

- Incorporate northbound and southbound left turn bays for northbound and southbound Jumpers Hole Road at Evening Star Drive into the traffic model and develop a simulation showing impacts of queuing through Woodholme neighborhood.

- Document how traffic model shows new gaps in Jumpers Hole Road based on coordination of red times between Walmart signal and proposed Evening Star signal. A list of traffic timing assumptions will be documented in the feasibility report.
- Lay out sidewalk and path options on plan view (with aerial imagery), showing existing right-of-way.
- Provide traffic volume counts in the final feasibility report.
- Investigate feasibility of automated speed enforcement along Jumpers Hole Road.
- Conduct signal warrant analysis at Jumpers Hole Road/Ashberry.
- Coordinate via MDOT SHA OPPE with District 5 regarding Jumpers Hole Road/ MD 2 improvements.

6.0 FINAL RECOMMENDATIONS

Based on the March 2, 2022 meeting, the project team discussed options for consolidating and improving initial recommendations to take advantage of the limited right-of-way in the study area and still try to meet the overall purpose and need. Specifically, the project team considered the following design elements:

- In support of a traffic signal, reviewing the traffic data and conducting a signal warrant for Evening Star / Jumpers Hole Road.
- Extending the proposed SUP south of the Walmart signal.
- Providing an additional marked crossing on the south leg of the Walmart signalized intersection.
- Insuring buffer space on all options for mailboxes along two blocks of Woodholme neighborhood where there is driveway frontage.
- Consideration of 11-foot lanes through the residential portion of Jumpers Hole Road.
- Eliminating the northbound 5-foot bike lane along the approach to MD 177 in order to shift all lanes eastward and create space for a buffered shared-use path entirely in County right-of-way.
- Add sidewalk at the northeast corner of MD 177 /Jumpers Hole Road where the *Dash-in* is.
- Consider sidewalk potential along the east side of Jumpers Hole Road under MD 100/10 overpasses.
- Consider reducing the northbound shoulder width and lane-shifting Jumpers Hole Road to have a wider/buffered shared-use path on the west side for mailboxes and street signs.
- Add crosswalks and pedestrian signals for south leg, east leg, and west leg at MD 177/Jumpers Hole Road.

Additionally, the project team revised the initial short and long term recommendations in favor of two new options that can be: 1) constructed using existing public right-of-way; and 2) an option that would require obtaining new right-of-way or public easement, with the idea that the infrastructure elements for each options are complementary and don't obstruct each other, such that they can be constructed all at once or piecemeal if funding isn't available for the entirety of the design.

7.0 RECOMMENDED ALTERNATIVE FOR 35% DESIGN

Several alternatives were examined for improving egress for local residents, expanding long-term pedestrian and bike access, and speed reduction through the neighborhood. Based on an analysis of several performance metrics and with the help of resident feedback, the project team ultimately concluded and recommends the following roadway improvements:

- A full traffic signal at the intersection of Jumpers Hole Road at Evening Star Drive
    - Removal of the southbound right turn lane.

  - Addition of southbound and northbound left turn bays.
  - Pedestrian crossing signals and crosswalks.
- Two new one-way roadway connections are also recommended. These connections would enhance egress opportunities for Woodholme residents by connecting Woodholme Cir (N) to Ashberry Lane and Evening Star Drive, respectively, providing an opportunity for residents of the Woodholme neighborhood to utilize the recommended signal for egress. These connections will take time to survey, obtain easements for, design and construct. Accordingly, design of these connections is recommended to occur in concert with the recommended signal at Evening Star / Jumpers Hole Road.
- A side path along the west side of Jumpers Hole Road from MD 177 to MD 2 is recommended. Note that there is sufficient right-of-way on the west side of Jumpers Hole Road such that this side path can be buffered from the main roadway with a variable-width grass buffer for street signs and for mailboxes, as need. Additionally, the side path can jog around existing utility poles in order to save construction time and cost. This path is recommended to be behind a new curb and gutter for Jumpers Hole Road, resulting in the need for construction of new stormwater inlets.
  - Note, a secondary option is to include a sidewalk along the east side of Jumpers Hole Road to reduce the need to cross twice for resident on the east of Jumpers Hole Road who want to walk to commercial offerings along the southern end of the project area.
- Re-stripe Jumpers Hole Road from MD 177 to the Walmart Signal to 11-foot wide travel lanes. And remove striped shoulders through Woodholme neighborhood so that the pavement can be repurposed for pedestrian or cycling needs.
- Provide pedestrian signals and crosswalks along the north and south legs of the intersection of Jumpers Hole Road at the Walmart signal.
- Provide marked uncontrolled crosswalks at Jumpers Hole Road / Woodholme Cir (N) and (S). The crossing at Woodholme Cir (N) will have a median pedestrian refuge to break up the crossing into two stages. The refuge island will also assist in traffic calming along Jumpers Hole Road.
- Incorporate intersection improvements at MD 177/ Jumpers Hole Road to include: new crosswalks and pedestrian signals along the south, east, and west legs as well as new sidewalk and pedestrian landings at the northwest, northeast, and southeast corners.
- Options for short-term congestion improvement: Re-stripe northbound left turn into the bowling alley as a southbound receiving lane. Northbound left turn volumes into the bowling alley were very light, as there are multiple access points from MD 2. Additionally, there was a need for more southbound capacity along Jumpers Hole Road, particularly in the PM peak hour.
- Speed management: While the presence of a recommended signal will provide an overall reduction in average speed through the Woodholme neighborhood, additional traffic calming is still recommended to reduce instances of speeding and to enhance pedestrian and bike crossing safety. Recommendations include, but are not limited to, narrowing lane widths to 11 feet; providing mountable curb islands in lieu of painted islands within the roadbed; high-visibility crosswalks; and street trees.
- Long-term congestion improvement: Consider widening Jumpers Hole Road for a short northbound right turn lane from MD 2 to the unsignalized Walmart driveway. This distance is about 180 feet, but because of the heavy demand and the roadway intersection skew, turning

northbound right into this driveway is a slow maneuver and results in queuing of vehicles along northbound Jumpers Hole Road that prevent motorists from entering Jumpers Hole Road northbound from the MD 2 intersection.

The following subsections highlight notable design features and assumptions for each element. Note, that hi-resolution drawings of this report's recommendations and typical roadway cross-sections can be found in Appendix J.

7.1 Proposed Design and Assumptions: Signal at Evening Star / Ashberry

The traffic signal proposed for this intersection is shown in Figure 29.

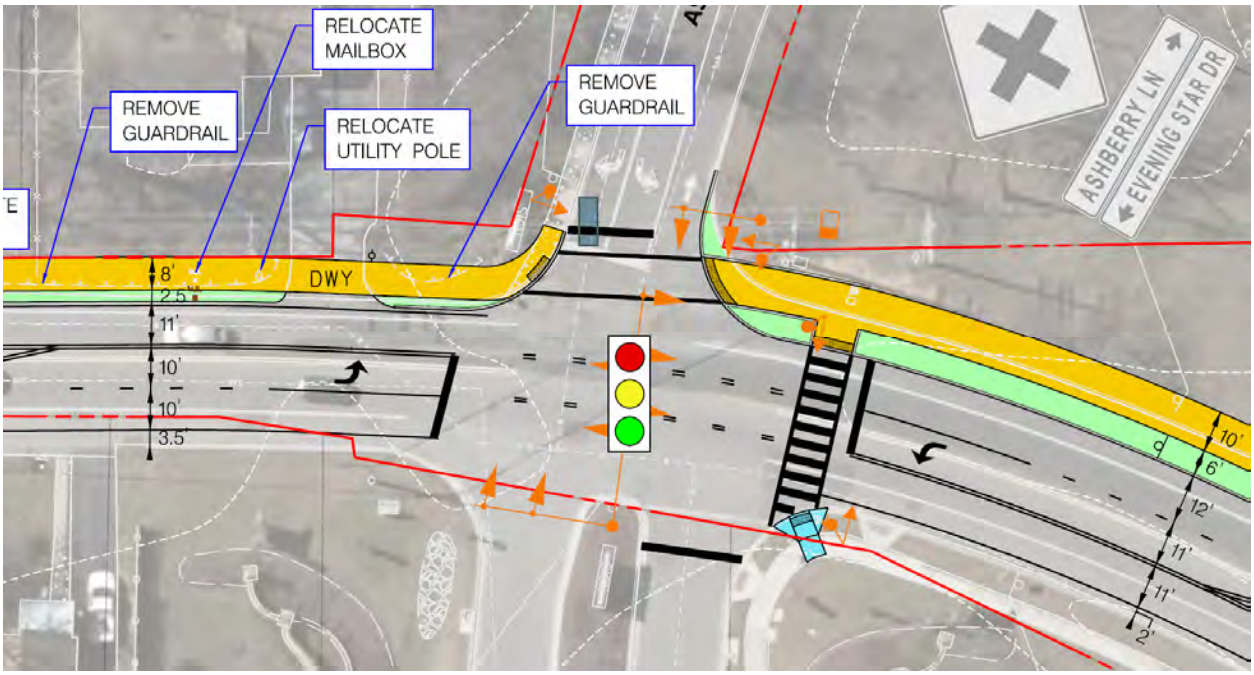

Figure 29: Recommended signal at Evening Star Drive / Jumpers Hole Road

Design characteristics include:

- 50 feet to 75 feet long left turn bays.
- Removal of the southbound right turn lane.
- Westside side path that is 8 feet to 10 feet in width with a variable-width buffer.
- Some signal equipment, such as signal poles and the signal controller, is shown on HOA property, however this can be modified in the 35% design phase.
- New pedestrian ramps and signalized crossing/crosswalk across the north leg connecting the existing sidewalk and the proposed side path.

Specific design assumptions related to the signal operations include:

- Signal Operations:
  - Actuated operation and coordinated with the Walmart signal.
  - Two-phase operation with concurrent mainline and side street phasing.

  - All left turns were assumed to be permissive only.
  - Pedestrian movements allowed on all 4-legs.
  - Right turn on red is allowed; however, this can be modified in the 35% design phase
- Signal timing details:
  - Cycle length: 90-seconds
  - Pedestrian movements: 7-second *WALK* phase, with 11-second and 17-second *Flashing Don't Walk* phase for side street and mainline, respectively.
  - Yellow clearance: 4-seconds
  - Red clearance: 2-seconds
- Other notes:
  - Signal was coordinated with the Walmart signal to have the same cycle length and offset such that both signals were red on the mainline at the same time.
  - Add a No Right Turn on Red for the westbound approach at the Walmart signal once the signals are coordinated.

These design characteristics should be considered the baseline starting point during the signal design phase.

7.2 Proposed Design and Assumptions: Side Path and Sidewalk

Note that there are dozens of permutations possible for adding sidewalk and a side path to the Jumpers Hole Road corridor, given that the path width, buffer width, and travel lane shoulder width can all be altered as needed to accommodate a public right-of-way that is also variable. Given this, two mutually exclusive options are recommended that provide a side path on the west side and then complementary sidewalk on the east side. The primary difference between the two options is that the sidewalk requires right-of-way takes (or easements) from adjacent property owners for a portion of its construction. For both options, Jumpers Hole Road is being recommended to have a closed section (i.e., curb and gutter) wherever new pedestrian facilities are proposed. Figure 30, Figure 31, and Figure 32 show how a wide buffered side path can be placed within existing public right-of-way along various segments of Jumpers Hole Road.

Figure 30 shows that there is available right-of-way for a 10' side path and a buffer for signage, while still maintaining 11-foot to 12-foot travel lanes. Of note, there is an existing utility pole where the path can either narrow to avoid it, or the pole can be relocated behind the path (relocating the utility poles closer to the roadway is undesirable from a safety standpoint).

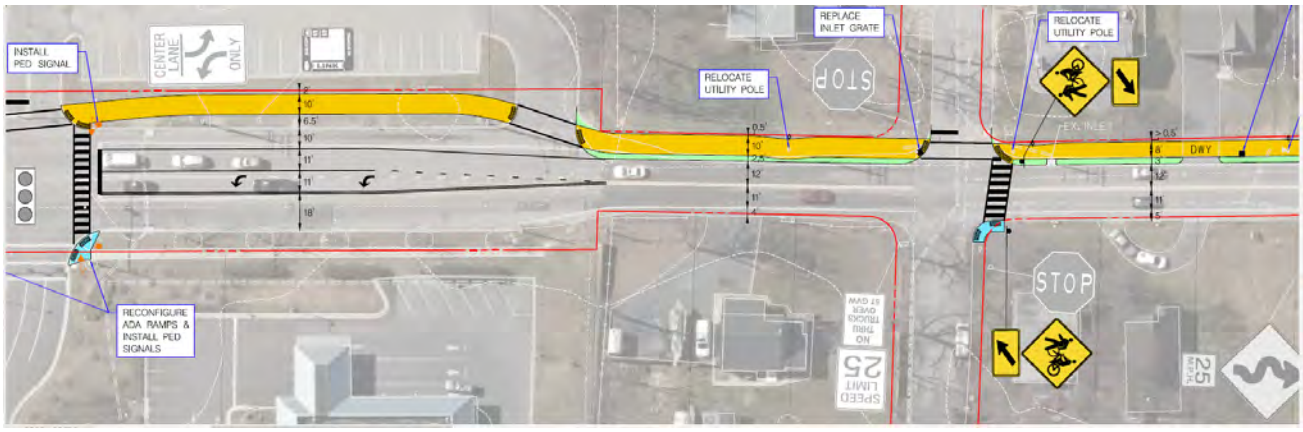

Figure 30: Side path between Walmart and Woodholme Cir (S)

Figure 31 shows that there is available right-of-way for an 8-foot side path and buffer for residential mailboxes and signage, while still maintaining 10-foot to 11-foot travel lanes. North of Evening Star Drive, the available right-of-way increases substantially, particularly in light of the recommendation to remove the southbound right turn lane from Jumpers Hole Road to Ashberry Lane. This recommendation is based on the low right turn volumes measured and the relatively lower speed expected for the Jumpers Hole Road corridor once the signal is constructed. Removing the right turn lane has the added benefit of reducing the overall impervious surface increase of the project as well as providing a wider (and planted) buffer between the path and travel lanes.

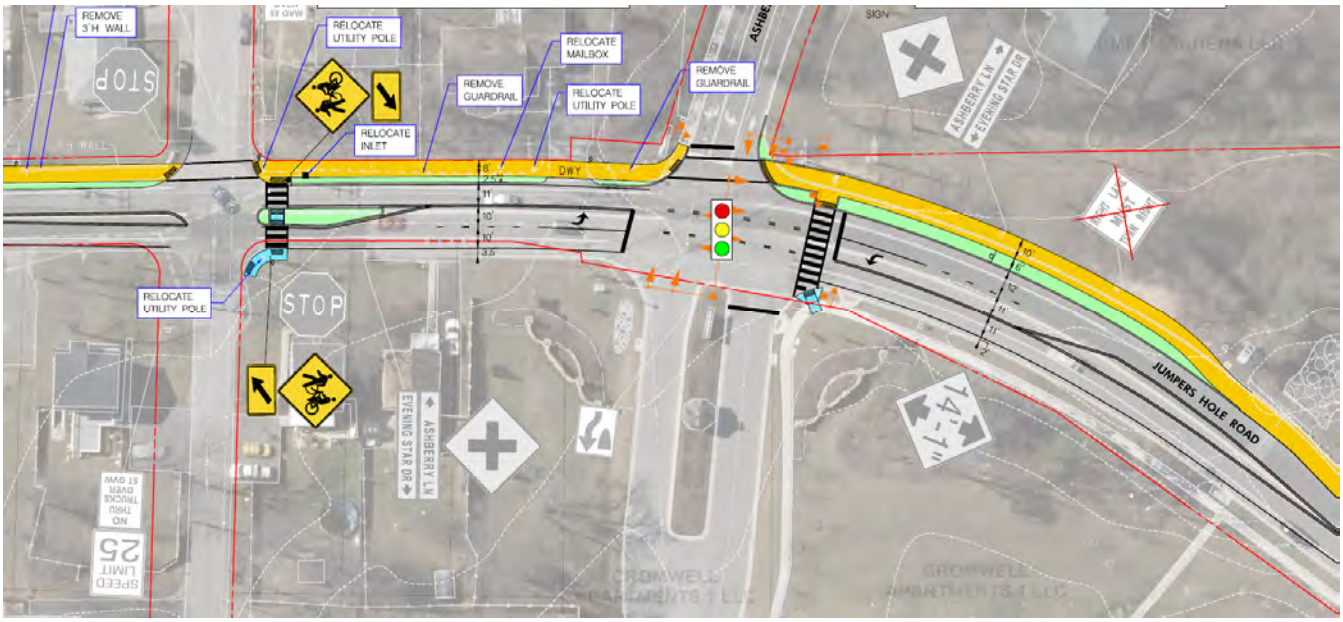

Figure 31: Side path between Woodholme Cir (N) and MD 100 overpass

Figure 32 shows how the roadways lane markings can be shifted slightly incorporate a 9-foot to 10-foot side path along Jumpers Hole Road from the MD 100 overpass to MD 177. The side path is proposed to be constructed behind a new curb and gutter in the existing roadway where there is currently a southbound shoulder. Note, that there is limited space for a buffer from the roadway in portions of this

segment. Underpass lighting is recommended for all areas of the side path under the MD 100 / MD 10 overpasses.

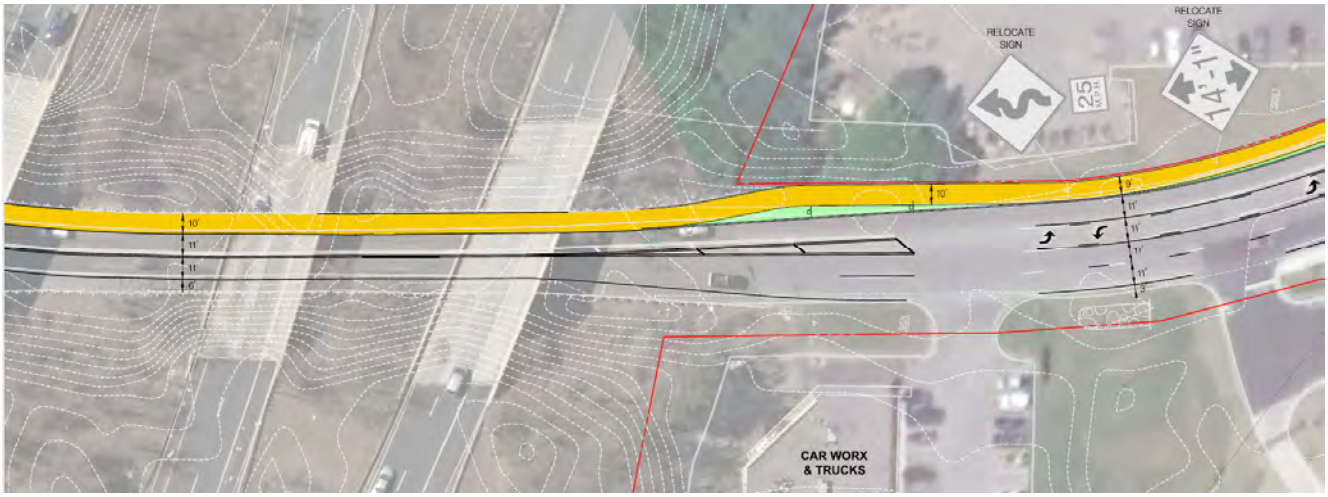

Figure 32: Side path between MD 100 overpass and Mountain Road

7.2.1 *Option for additional Sidewalk*

In addition to a side path along the southbound side of Jumpers Hole Road, there is an option for sidewalk along the northbound side. There is currently sidewalk on the northbound side just beyond the Walmart Signal and adjacent to Creekstone Village, as well as sidewalk on the northbound approach to MD 177. Figure 33 shows that any sidewalk constructed through Woodholme will largely be located in private right-of-way and would require a property take or easement.

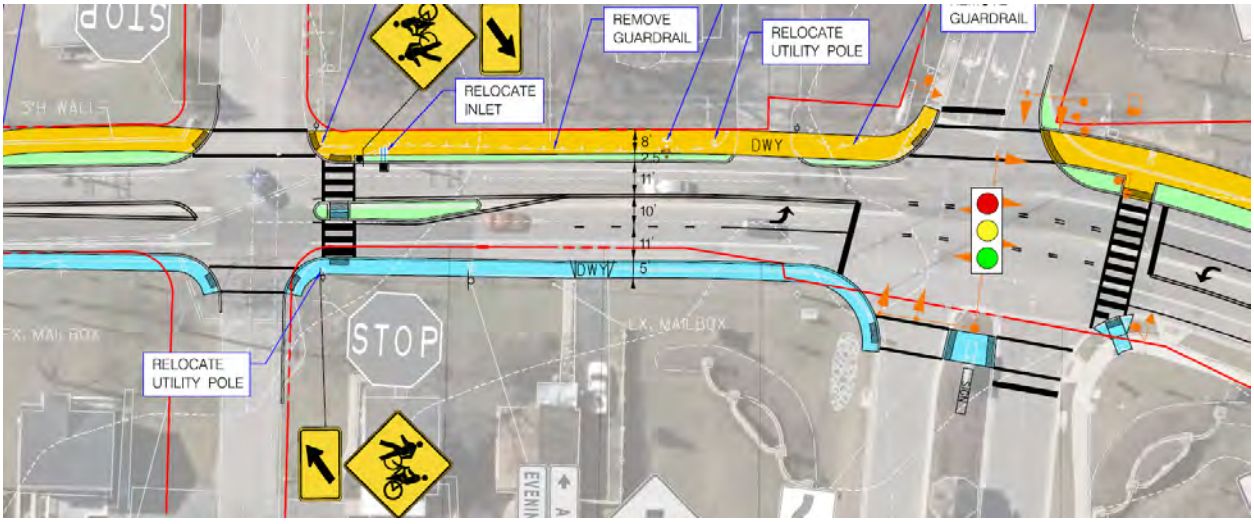

Figure 33: Recommended sidewalk between Walmart and Creekstone Village

As shown in Figure 34, new east-side sidewalk north of Evening Star Drive recommended is in the public right-of-way, with no private easements or takes required. The sidewalk is shown as unbuffered from the roadway due to the landscape grades behind the side of the road. Under the MD 100 / MD 10 overpass, the sidewalk is recommended where the existing northbound shoulder is located. North of the overpass, there is existing curb that sidewalk can be placed behind. Of note, there is a new

stormwater facility that will have to be modified to allow sidewalk access or be bridged with a short pedestrian bridge. This segment of sidewalk will connect into the existing sidewalk recently constructed for the *Dash-in* redevelopment.

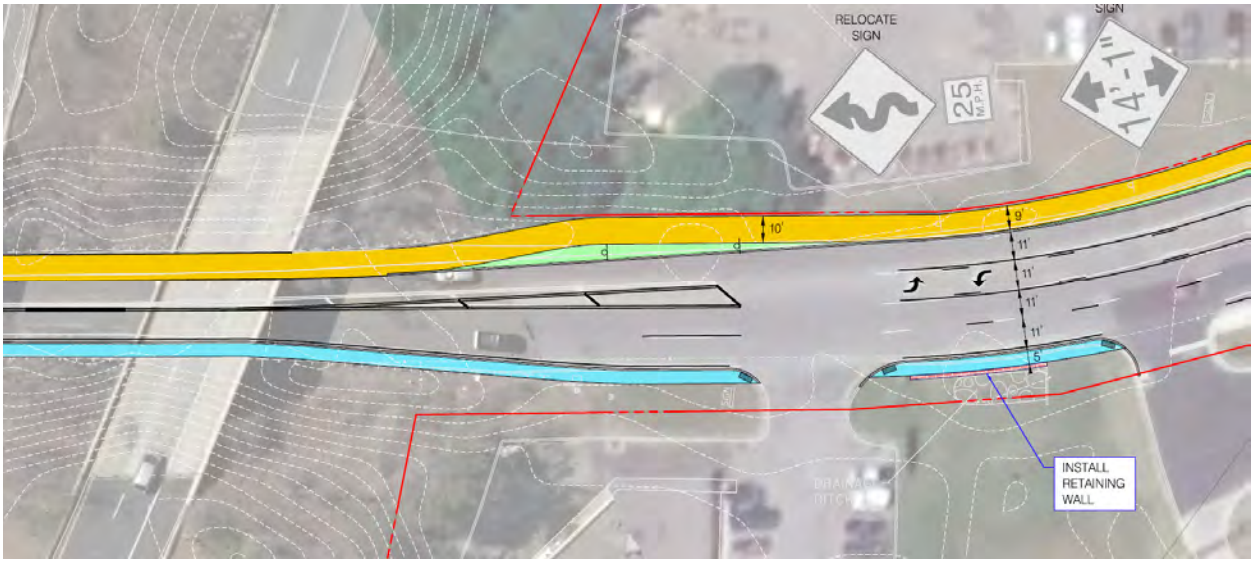

Figure 34: Recommended sidewalk between Creekstone Village and MD 177

7.3 Proposed Design and Assumptions: Uncontrolled Crossings

As shown in Figure 35, two new uncontrolled crossings are recommended through the Woodholme neighborhood. At Woodholme Cir (N) there is room to incorporate a pedestrian median refuge island to break up the pedestrian crossing. At Woodholme Cir (S), there is less right-of-way for a refuge. Both crossings are proposed to have continental crosswalks for high visibility and to remind drivers to look for pedestrians. Additionally, pedestrian ramps are recommended on the east side of Jumpers Hole Road. Other uncontrolled crossing treatments, such as Rectangular Rapid Flashing Beacons (RRFB) should be evaluated for installation at Woodholme Cir (N) and (S) for added pedestrian safety. RRFB should be evaluated in conjunction with louvres to keep the lights focused on the roadway and away from houses that are sited close to Jumpers Hole Road.

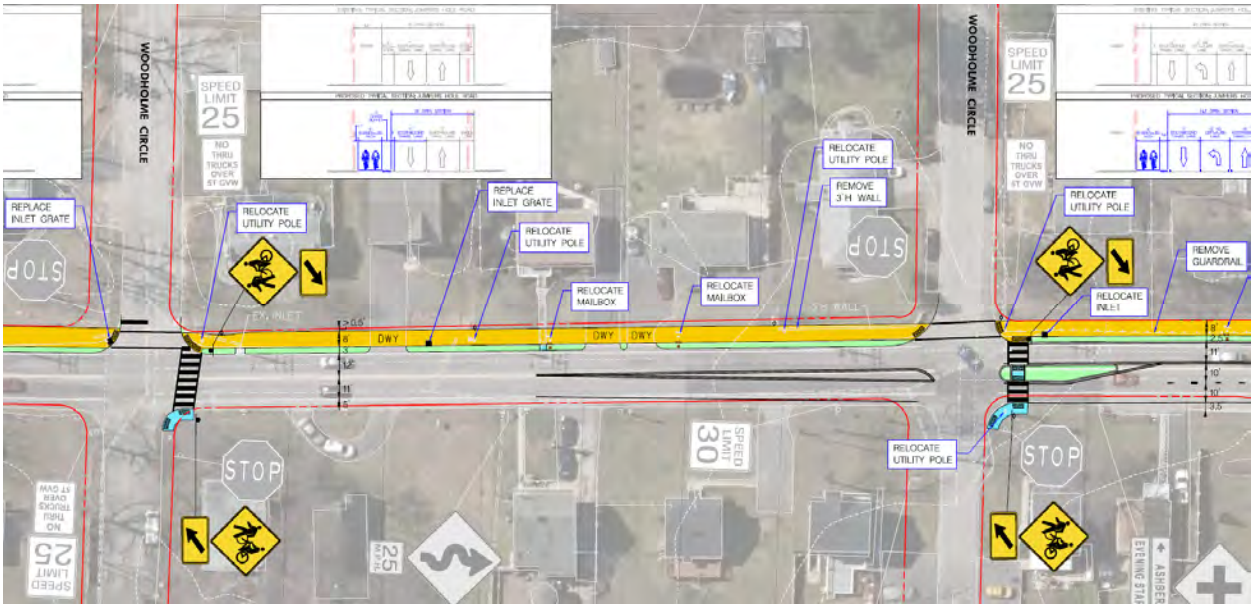

Figure 35: Recommended uncontrolled crossings through Woodholme

7.4 Proposed Design and Assumptions: Walmart Signal Improvements

The existing traffic signal for this intersection is shown in Figure 36. Of note, two new pedestrian crossings are proposed across Jumpers Hole Road - on the north and south legs. The proposed pedestrian signals will run concurrently with parallel green phases, such that no new phases are proposed to be added to the signal. Existing sidewalk along the Walmart entrance is on the south side of the driveway approach, while the bus stop is on the north side of the intersection. Reconstructed pedestrian ramps will also be needed to accommodate new signalized crossings. Additionally, as shown in Figure 36, extension of the side path (shown in orange), to replace the existing sidewalk, south to MD 2 is recommended. There is available right-of-way at this location, such that design of an 8' to 10' side path can jog around any utilities that are expensive to relocate. A shared use path is preferred over sidewalk, as it will bring the proposed side path one block closer to the B&A trail, located south of MD 2.

In addition to the intersection improvements discussed, an option exists for repurposing the northbound left turn lane into a southbound receiving lane. Traffic counts showed that this northbound left turn movement is very low. Additionally, southbound Jumpers Hole Road queues back from MD 2 into a single lane, such that WM traffic that is trying to egress has no available capacity to turn left on to southbound Jumpers Hole Road.

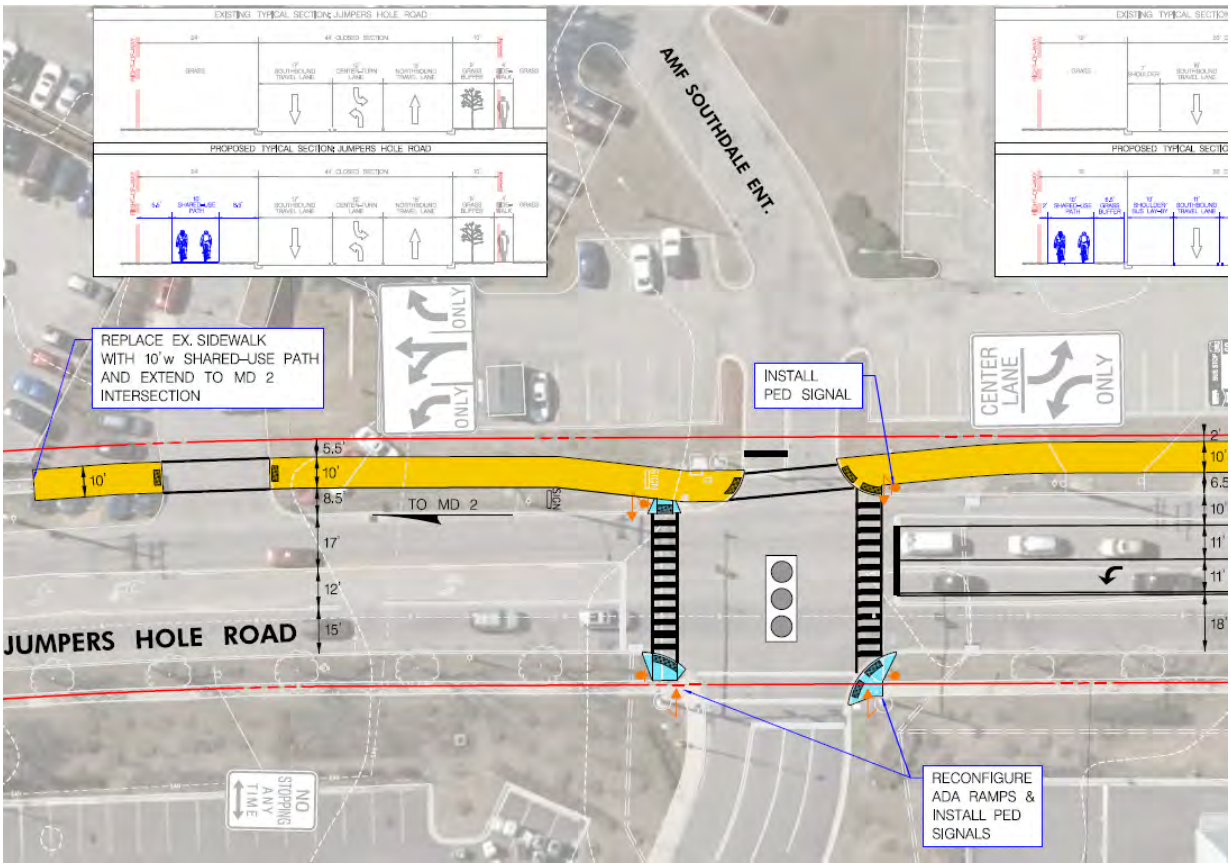

Figure 36: Recommended changes to the existing Walmart signal

7.5 Proposed Design and Assumptions: MD 177 intersection

As shown in Figure 37, several bike/pedestrian safety improvements are proposed for the intersection of MD 177 (Mountain Road) at Jumpers Hole Road. Currently there are no dedicated pedestrian crossings or marked crosswalks at any leg of the intersection. Proposed are new pedestrian signals and marked crosswalks for the east, west, and south legs. The proposed pedestrian signals will run concurrent with parallel green phases, such that no new phasing is proposed to be added to the signal. Because there is limited sidewalk at this intersection, additional recommendations include incorporating pedestrian receiving ramps at all four corners of the intersection.

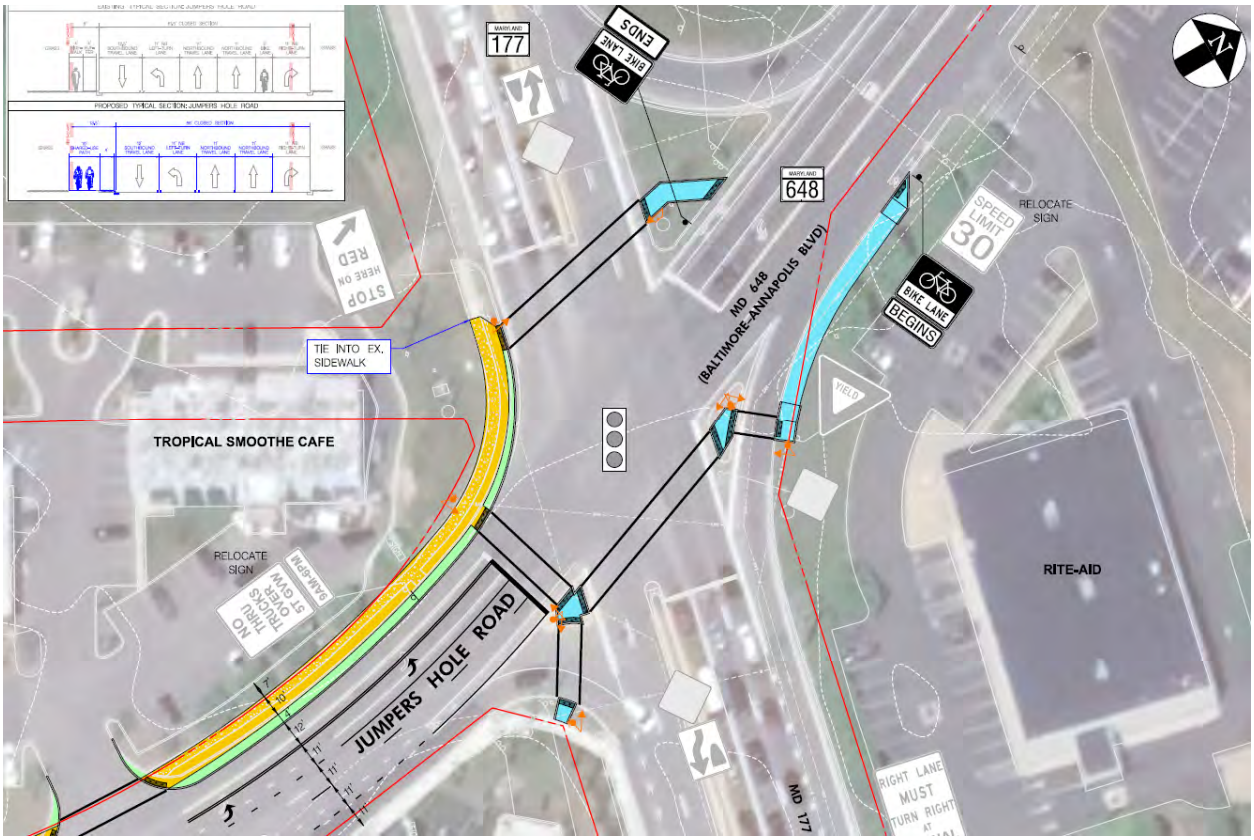

Figure 37: Proposed Improvements at the intersection of Jumpers Hole Road at MD 177

Of note, there is a northbound bike lane along Jumpers Hole Road that was recently installed as part of a developer improvement. However, given the right-of-way constraints on the northbound approach and the desire for a buffered side path on the west side of Jumpers Hole Road, it is recommended to remove the bike lane and shift all of the existing lanes 5 feet to the east. This will allow for construction of a grass buffer and side path (with a relocated curb) on the west side of the approach to MD 177 without infringing on private right-of-way.

7.6 Public Presentation and Feedback

On May 23, 2022, the project team presented these recommendations to the public via a virtual meeting. Recommended project plans and typical sections were added to a County project website along with prior presentations and a recorded presentation of the final recommendations. *Appendix H* contains this presentation.

7.6.1 *Online Comments*

In addition to receiving verbal comments during and after the presentation, the Project Team provided an online mapping tool that allowed users to pan and zoom along the recommended plan set and geolocate comments at specific areas of interest (see Figure 38).

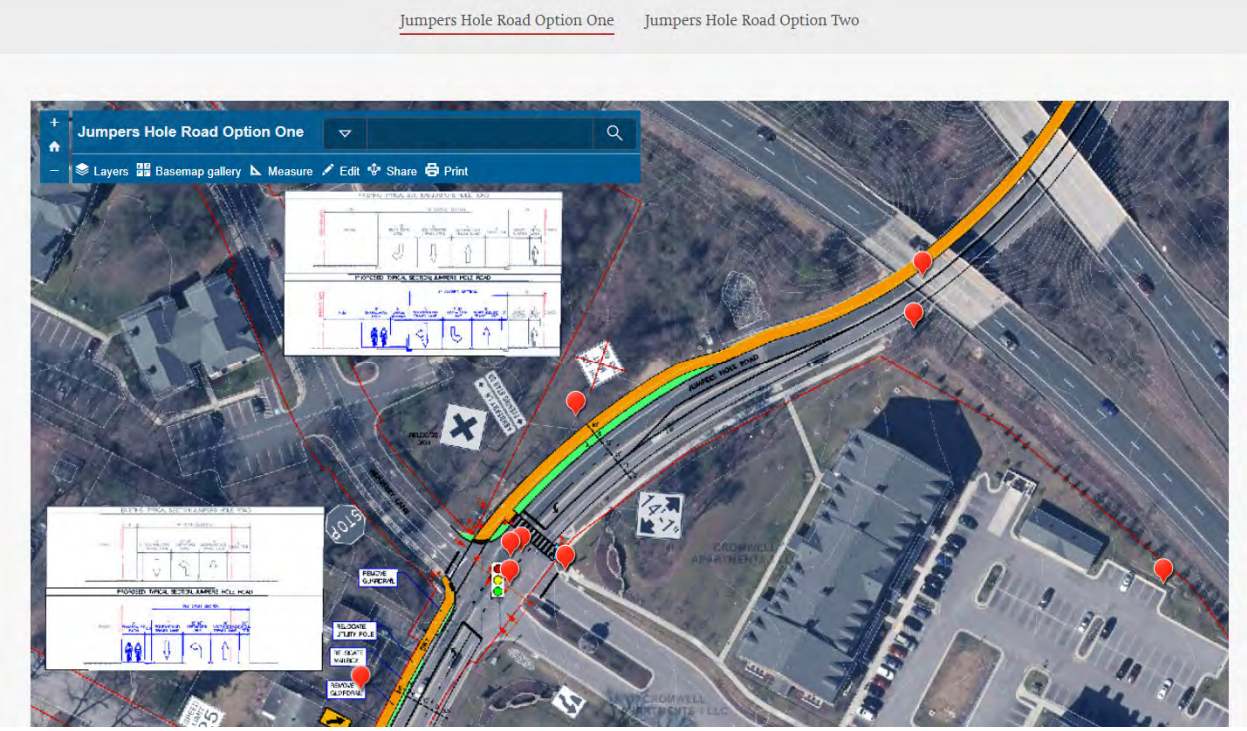

Figure 38: Screen capture of online commenting tool

A summary of the comments is as follows:

- There was concern that the proposed pedestrian crossings at MD 177 / Jumpers Hole Road did not have sidewalk beyond the project study area.
- There was a desire to see protection from vehicles for portion of shared use path under the MD 100 / MD overpass.
- The need for sidewalk was noted along the proposed optional roadway connection between Evening Star Drive and Woodholme Cir (N).
- Concern about homeowner maintenance of new facilities.
- Concern about proposed pedestrian refuge island blocking traffic in the presence of a left turning vehicle.
- Concern about the need for multiple utility relocations.
- Question about the protective quality of the buffer between the roadway and shared use path
- Concerns about speeding and a desire to see protection (e.g., guardrail).
- Strong desire to see the shared use path extend beyond the Walmart signal south to MD 2 (and beyond to the B&A trail).

All of the comments posted to the online mapping tool are included in Appendix I.

8.0 NEXT STEPS

Moving the feasibility report recommendations into the Design and Construction Stage involves the following steps:

- Select elements of the recommended project to move into the design stage. For example, there are several pieces that can move into the design phase before the cross-section of the side path or sidewalk option is finalized – such as the side path *south* of the Walmart Signal; pedestrian signal improvements at the Walmart signal; pedestrian crossing improvements at Mountain Road / Jumpers Hole Road; and the removal of the southbound right turn lane at Jumpers Hole Road / Ashberry Lane.
- Finalize a standard cross-section that can implemented without obtaining private right-of-way/easements. This could include a side path along the entire west side of the corridor as well as sidewalk from Evening Star north to MD 177.
- Keep the community engaged with regard to design details as the design stage progresses into 30% design.

Note that, as of this report's completion, design and construction funds have already been programmed, into the County's CIP.

9.0 PROJECT SUMMARY

Jumpers Hole Road is a north-south two-lane minor arterial of varying width within the Pasadena/ Marley Neck Small Area Plan and is maintained by Anne Arundel County. The segment of Jumpers Hole Road under evaluation is about 2/3rd of a mile in length and connects Richie Highway (MD 2) with Mountain Road (MD 177), passing through both residential areas and commercial developments. The intersections of MD 2 at Jumpers Hole Road and MD 177 at Jumpers Hole Road are maintained by MDOT SHA. This corridor has limited pedestrian and bike facilities and average weekday traffic of about 20,000 cars per day. With transit stops, shopping, and proximity to the popular Baltimore & Annapolis hiker/ biker trail, Jumpers Hole Road is in need of pedestrian and bike infrastructure upgrades. Additionally, speed management is a concern for residents whose property abuts Jumpers Hole Road, as this portion of the road is open-section. Finally, a primary impetus for this study is the general difficulty in accessing mainline Jumpers Hole Road from the three residential side streets that are all stop-controlled – Evening Star Drive / Ashberry Lane; Woodholme Cir (N); and Woodholme Cir (S). An added concern is the congestion at the southern end of the segment – in between MD 2 and the signalized entrance to Walmart.

This report identifies alternatives to address vehicle access from side streets; bike and pedestrian improvements; and speed reduction, as well as congestion management, without increasing the number of through travel lanes. This report documents existing traffic conditions, crash history, and overall roadway geometry (existing infrastructure, roadway dimensions, locations of utilities and other obstacles, etc.). Existing traffic conditions were modeled and validated using industry-standard software, which was then modified to test several different engineering designs for providing gaps in Jumpers Hole Road traffic to allow side street access, while also preserving the limited available right-of-way for installation of curb-protected side paths and sidewalk. Based on an evaluation of these designs this report's recommendations include:

- Installing a full traffic signal the intersection of Evening Star Dr and Jumpers Hole Road. This signal will allow residents along Ashberry Lane and Evening Star Drive to have controlled dedicated access to Jumpers Hole Road. Additionally, signalized pedestrian crossings and marked crosswalks are recommended at the intersection. Finally, the signal is recommended to be timed and coordinated with the Walmart traffic signal, such that both signals are red along Jumpers Hole Road at the same time in order to facilitate easier egress to Jumpers Hole Road from Woodholme Cir (N) and (S).
    - Two new one-way roadway connections are also recommended parallel to Jumpers Hole Road. These connections would enhance egress opportunities for Woodholme residents by connecting Woodholme Cir (N) to Ashberry Lane and Evening Star Drive, respectively, providing an opportunity for residents of the Woodholme neighborhood to utilize the recommended signal for egress, if desired. These connections are anticipated to be constructed after the traffic signal at Evening Star Drive is built. Once the connections are completed, signal timing changes may then be adjusted, as needed, to reflect any changes to travel patterns.
- Marked crosswalks are recommended for crossing Jumpers Hole Road at Woodholme Cir (N) and (S), with pedestrian refuge median islands where feasible.
- Pedestrian signals and marked crosswalks are recommended for crossing Jumpers Hole Road at the existing Walmart traffic signal.
- Pedestrian signals and marked crosswalks are recommended at the intersection of Jumpers Hole Road and Mountain Road (MD 177).
- A buffered shared use path is recommended along the west side of Jumpers Hole Road where there is existing right-of-way. This path can vary in width from 8 feet to 10 feet and extend from MD 2 to MD 177.
- Evaluating the feasibility of traffic calming is recommended corridor-wide and at unsignalized intersections along Jumpers Hole Road through the Woodholme neighborhood to reduce instances of speeding and to enhance pedestrian and bike crossing safety.
- Upgrading the MTA bus stop with shelters, crosswalks, and ADA complaint landing areas is recommended.
- Adding sidewalk along the east side of Jumpers Hole Road is recommended.
    - Proposed sidewalk from Evening Star to MD 177 is within existing public right-of-way.
    - Proposed sidewalk from Evening Star south to the Walmart signal is largely in private right-of-way and will require an easement.
- Adding lighting under the MD 100 / MD 10 overpass is recommended to light the proposed shared use path and sidewalk.
- Interim traffic improvements evaluated in this study include repurposing the northbound left-turn lane from Jumpers Hole Road, at the Walmart signal, into a southbound receiving lane. A recommended longer-term traffic improvement is for a new northbound right turn lane along Jumpers Hole Road from MD 2 to the unsignalized Walmart Driveway.