

November 4, 2019

Mr. Michael Zuraf, AICP
Stafford County
1300 Courthouse Road
Stafford, Virginia 22554
Phone: (540) 658-8668

Reference: Wawa – Port Aquia Drive – Traffic Impact Analysis (TIA)
Stafford County, Virginia

Dear Mr. Zuraf,

Ramey Kemp & Associates, Inc. (RKA) has performed this TIA to support the proposed convenience store in the southwest quadrant of the intersection of U.S. 1 at Port Aquia Drive. The preliminary site plan includes a 5,750 square foot (s.f.) convenience store with 16 fueling positions (f.p.). The access plan includes one full-movement driveway on Port Aquia Drive approximately 365 feet west of U.S. 1, and one right-in / right-out driveway on U.S. 1 approximately 430 feet south of Port Aquia Drive.

If approved, the proposed convenience store is expected to be built by 2021. Figure 1 shows the site location and study intersections, and Figure 2 shows the preliminary site plan.

The purpose of this letter report is to provide the following:

- Trip generation calculations
- Evaluation of turn lane warrants for the proposed site driveways
- Capacity analysis of study intersections

Existing Roadway Conditions

U.S. 1 is a four-lane Principal Arterial with an average daily traffic (ADT) volume of approximately 26,000 vehicles per day (vpd) and a posted speed limit of 45 miles per hour (mph).

Port Aquia Drive is a two-lane local roadway with an ADT volume of approximately 1,500 vpd and a posted speed limit of 25 mph.

The existing lane configuration is shown in Figure 3.

Existing Traffic Volumes

The AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were conducted by Peggy Malone and Associates, Inc. at the following intersection on May 15:

- U.S. 1 at Port Aquia Drive / Church Driveway

The peak hour turning movements for U.S. 1 at Telegraph Road were counted by Technical Traffic Services during the week of October 21. The traffic data are enclosed, and the existing 2019 volumes are shown in Figure 4.

Background Traffic Growth

Based on discussion with the County and VDOT, the existing 2019 volumes were grown by an annual rate of 1.0% for two years to estimate the 2021 no-build volumes. Figure 5 shows the no-build (2021) peak hour traffic volumes.

Approved Development Traffic

Based on discussion with the County and VDOT, there are no approved developments near the site that will add a significant amount of traffic.

Trip Generation

The trip generation potential of the proposed convenience store was estimated by using the multi-variable regression formula published by ITE. Table 1 shows the ITE trip generation potential of the proposed convenience store.

**Table 1
ITE Trip Generation – Weekday – 10th Edition**

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Super Convenience Market / Gas Station (960)	16 f.p. / 5,750 s.f.	2,460 ²	2,460 ²	275 ¹	275 ¹	217 ¹	217 ¹
ITE Pass-by Trips: 63% AM / 66% PM		-1,586	-1,586	-173	-173	-143	-143
New Primary Trips		874	874	102	102	74	74

1 – Value was determined using the multi-variable regression formula published by ITE

2 – Assumes the AM peak hour and PM peak hour each represent 10% of the daily traffic volume

Convenience stores attract pass-by trips, which are made by drivers who are already driving by the site today and will visit the convenience store in the future because it is convenient. The ITE pass-by rates are shown in Table 3.

Site Traffic Distribution

The following primary site traffic distribution was applied based on a review of the existing traffic volumes, the adjacent roadway network, and engineering judgement:

- 57% to / from the south on U.S. 1
- 20% to / from the north on U.S. 1
- 20% to / from the northeast on Telegraph Road
- 3% to / from the west on Port Aquia Drive

It was assumed that all pass-by trips will originate from U.S. 1. Based on the existing traffic counts, the following directional distributions were applied to U.S. 1:

- AM Peak – 80% northbound / 20% southbound
- PM Peak – 25% northbound / 75% southbound

Figures 6 and 7 show the primary and pass-by site trip distributions, respectively. Figures 8, 9, and 10 show the primary, pass-by, and total site trip assignments. The build 2021 peak hour traffic volumes are shown in Figure 11.

VDOT Turn Lane Warrant Analysis

The projected build-out AM and PM peak hour traffic volumes at the proposed driveways were compared to the turn lane warrants in the VDOT *Access Management Design Standards for Entrances and Intersections*:

Port Aquia Drive at Proposed Full-movement Driveway:

- No turn lanes are warranted

U.S. 1 at Proposed Right-in / Right-out Driveway:

- The AM peak hour volumes warrant a southbound right-turn taper on U.S. 1 and the PM peak hour volumes warrant a right-turn lane

The turn lane warrant diagrams are enclosed for reference, and Figure 12 shows the recommended lanes.

Intersection Spacing Standards

VDOT requires at least 305 feet of separation between traffic signals and partial access driveways on Principal Arterial roadways posted 45 mph. The proposed right-in / right-out driveway on U.S. 1 is approximately 430 feet south of Port Aquia Drive, and 265 feet north of the hotel driveway. At the TIA scoping meeting, it was agreed that the proposed driveway location is acceptable due to topographical constraints, and VDOT prefers to have the driveway further from the Port Aquia traffic signal.

VDOT requires at least 225 feet of corner clearance for the proposed site driveway on Port Aquia Drive. The proposed site driveway has approximately 270 feet of corner clearance, which exceeds VDOT minimum spacing standards.

Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 10, which is a comprehensive software package that allows the user to model signalized and unsignalized intersections to determine levels-of-service based on the thresholds specified in the Highway Capacity Manual (HCM) – 6th Edition. Note that the reported queues were determined using SimTraffic. The SimTraffic maximum queues shown are the average of ten simulation runs.

Table 2 summarizes the capacity analysis results for the signalized intersection of U.S. 1 at Port Aquia Drive / Church Driveway, and all of the Synchro and SimTraffic outputs are enclosed for reference.

**Table 2
Level-of-Service Summary for U.S. 1 at Port Aquia Drive / Church Driveway**

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing (2019) Traffic Conditions	EBL/T	F	82.4	66	A (7.7 sec)	E	75.4	46	B (15.6 sec)
	EBR	B	10.4	22		A	8.3	17	
	WBL/T	E	75.5	50		F	89.1	82	
	WBR	A	0.9	0		A	0.3	0	
	NBL	A	2.1	6		D	38.1	72	
	NBT	A	7.4	730		A	4.9	185	
	NBR	A	0.0	0		A	0.0	0	
	SBL	A	2.9	4		A	2.7	8	
	SBT	A	3.5	107		B	18.0	1,209	
SBR	A	0.0	0	A	0.1	1			
No-Build (2021) Traffic Conditions	EBL/T	F	87.5	69	A (7.7 sec)	E	75.1	46	B (15.0 sec)
	EBR	B	11.3	23		A	8.8	19	
	WBL/T	E	78.2	51		F	89.2	84	
	WBR	A	1.0	0		A	0.3	0	
	NBL	A	2.0	5		D	38.6	75	
	NBT	A	7.2	719		A	5.0	192	
	NBR	A	0.0	0		A	0.0	0	
	SBL	A	2.4	4		A	1.7	3	
	SBT	A	3.3	141		B	17.1	382	
SBR	A	0.2	1	A	0.1	0			
Build (2021) Traffic Conditions	EBL/T	F	99.0	337	C (22.6 sec)	F	98.6	155	C (27.7 sec)
	EBR	A	5.5	22		A	1.5	0	
	WBL/T	D	51.2	43		E	75.4	82	
	WBR	A	0.2	0		A	0.2	0	
	NBL	A	9.5	99		E	73.6	204	
	NBT	C	20.2	1,014		A	6.8	203	
	NBR	A	0.0	0		A	0.0	0	
	SBL	A	6.6	4		A	3.0	3	
	SBT	B	11.7	125		C	31.3	698	
SBR	A	0.4	0	A	0.6	3			

Capacity analysis indicates that this intersection currently operates at LOS A during the AM peak hour and at LOS B during the PM peak hour. Under no-build conditions, this intersection is expected to continue to operate at LOS A during the AM peak hour and at LOS B during the PM peak hour.

Under build conditions, the intersection is expected to operate at LOS C during the AM and PM peak hours. No geometric improvements are warranted or recommended at this intersection.

Table 3 summarizes the capacity analysis results for the unsignalized intersection of U.S. 1 at Proposed Right-in / Right-out Driveway, and all of the Synchro and SimTraffic outputs are enclosed for reference.

Table 3
Level-of-Service Summary for U.S. 1 at Proposed Right-in / Right-out Driveway

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Build (2021) Traffic Conditions	EBR ¹	B	11.5	13	N/A ²	F	187.0	233	N/A ²
	NBT	-	-	-		-	-	-	
	SBT	-	-	-		-	-	-	
	SBR	-	-	-		-	-	-	

1. Level of service for minor approach
2. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the minor street right-turn movement is projected to operate with short delays (less than 25 seconds) during the AM peak hour and with long delays (greater than 50 seconds) during the PM peak hour. Long delays are typical for minor street movements at intersections with major thoroughfares.

Table 4 summarizes the capacity analysis results for the proposed unsignalized intersection of Port Aquia Drive at Full-movement Driveway, and all of the Synchro and SimTraffic outputs are enclosed for reference.

Table 4
Level-of-Service Summary for Port Aquia Drive at Full-movement Driveway

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Build (2021) Traffic Conditions	EBT/R	-	-	-	N/A ³	-	-	-	N/A ³
	WBL ²	A	7.9	15		A	7.6	10	
	WBT	-	-	-		-	-	-	
	NBL ¹	B	14.7	0		B	12.6	0	
	NBR ¹	A	9.7	20		A	8.9	5	

1. Level of service for minor approach
2. Level of service for major street left-turn movement
3. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates that the minor street left-turn movement is projected to operate with short delays (less than 25 seconds) during the AM and PM peak hours.

Recommendations

Based on the trip generation potential of the proposed convenience store, the following off-site roadway improvements are recommended:

U.S. 1 at Right-in / Right-out Driveway:

- Restripe the southbound U.S. 1 curb lane as a right-turn lane
- Construct site driveway with one ingress lane and one egress lane

Port Aquia Drive at Full-movement Driveway:

- Restripe westbound Port Aquia Drive to designate one left-turn lane and one through lane
- Construct site driveway with one ingress lane and two egress lanes

The recommended lane configuration is shown in Figure 12.

We appreciate your attention to this matter. Please contact me at (804) 217-8560 if you have any questions about this report.

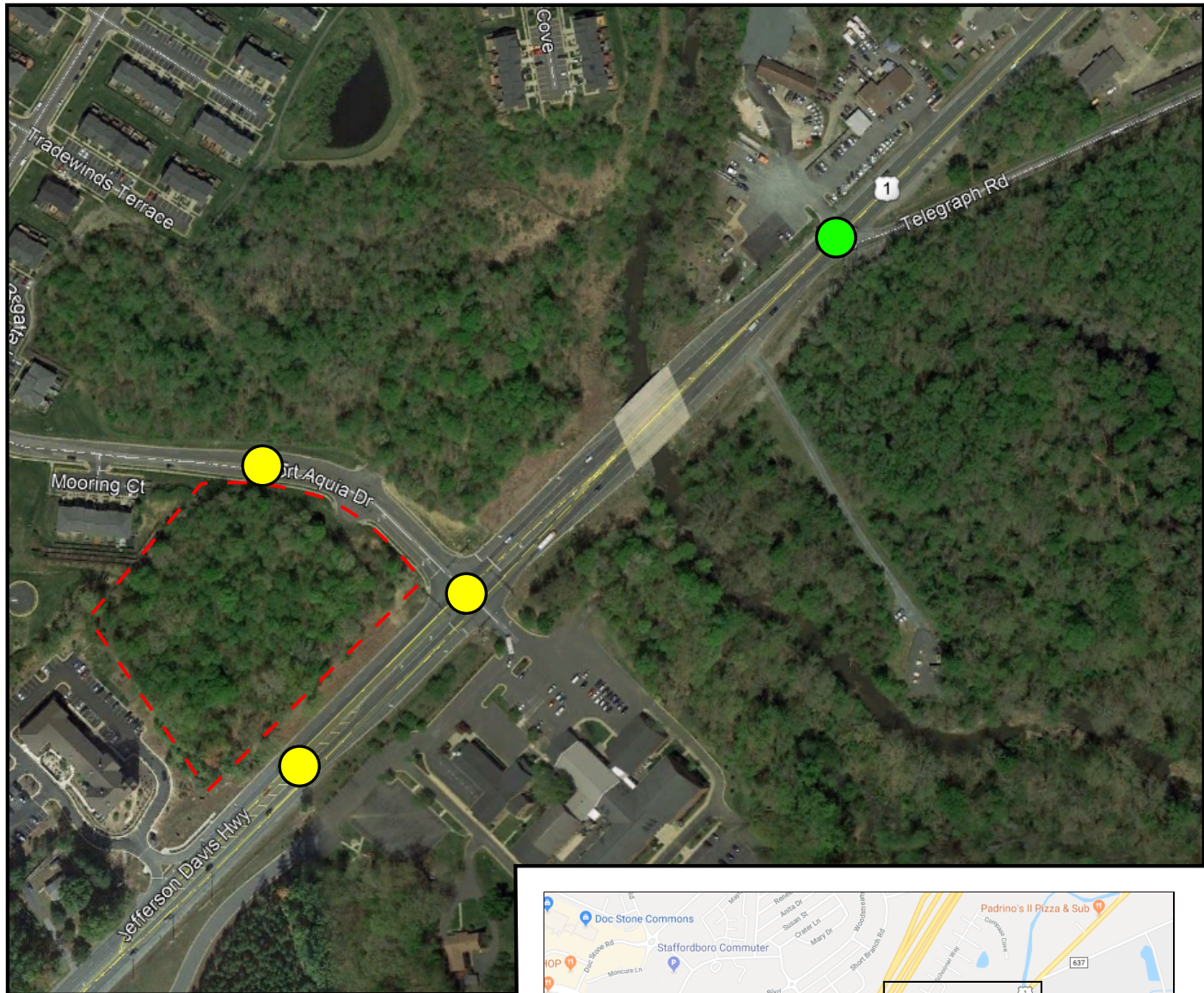
Sincerely yours,
Ramey Kemp & Associates, Inc.



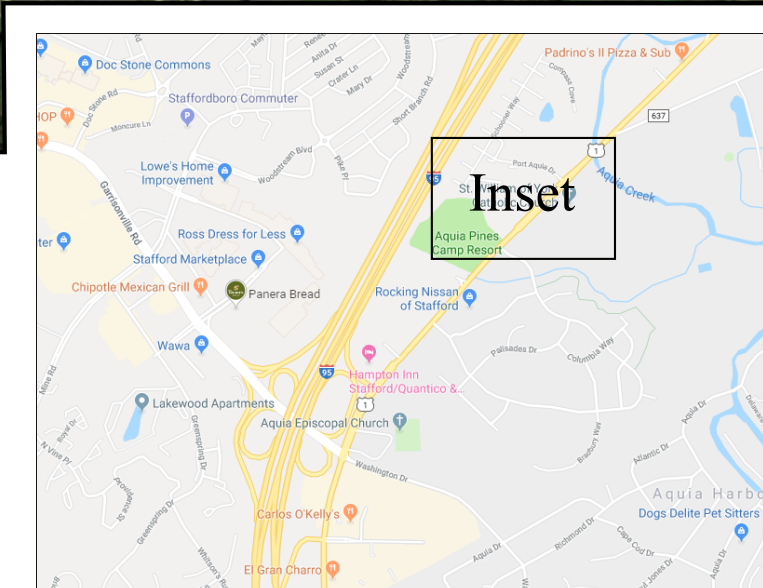
Carl Hultgren, P.E., PTOE
Regional Manager

Enclosures: Figures, Traffic count data, Synchro and SimTraffic output, VDOT turn lane warrant diagrams

Copy to: Ms. Margaret Niemann, VDOT
Mr. David Beale, P.E., VDOT
Mr. Peter Hedrich, P.E., PTOE, VDOT
Mr. Chas Collins, Collins Contracting, LLC
Mr. Justin Franklin, P.E., Fairbanks & Franklin






Inset



Overview



LEGEND

-  Study Intersection
-  For Signal Coordination Only
-  Site Boundary

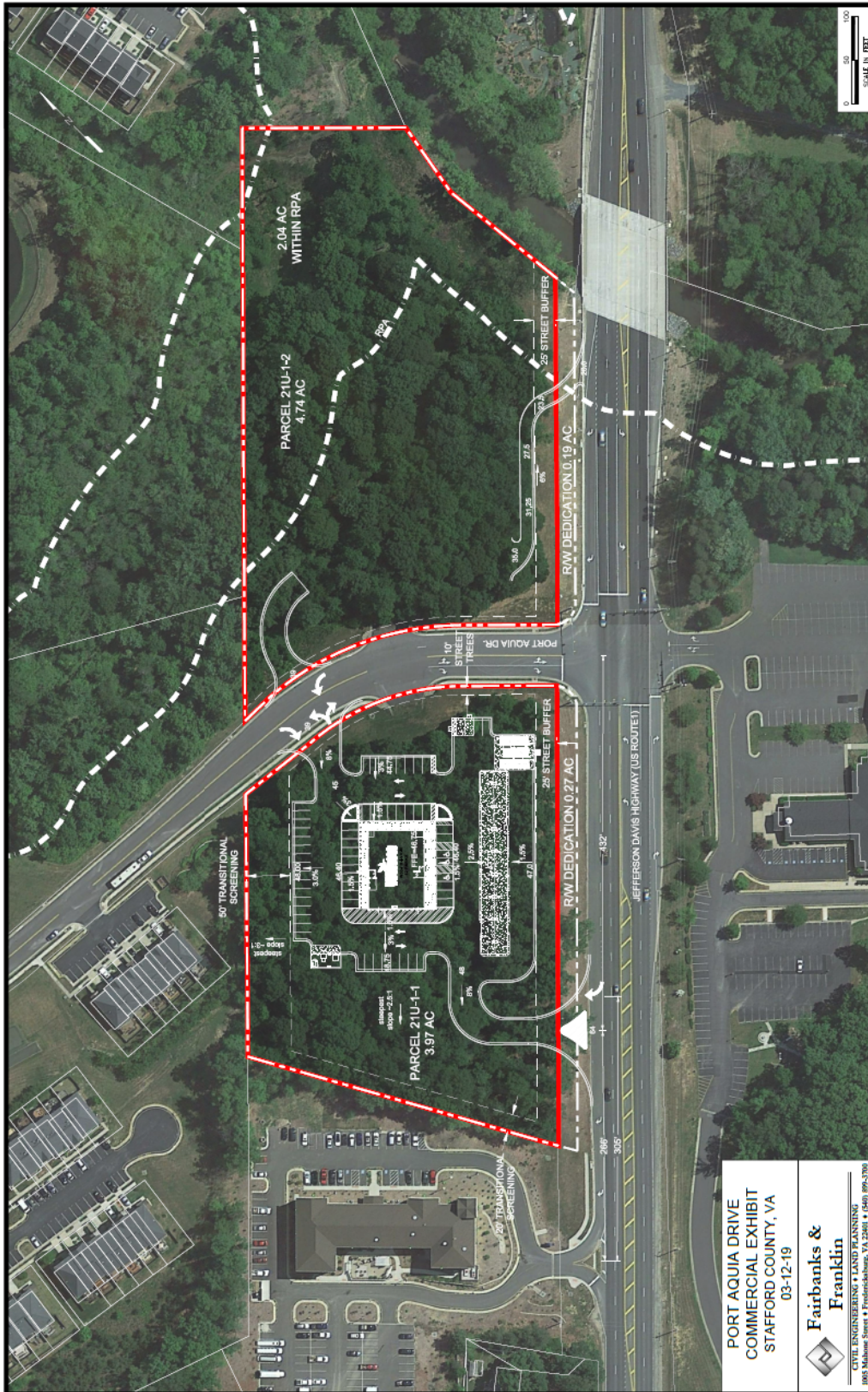


Wawa
Port Aquia Drive
Stafford County, Virginia

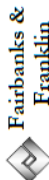
Site Location and
Study Intersections

Scale: Not to Scale

Figure 1



PORT AQUIA DRIVE
 COMMERCIAL EXHIBIT
 STAFFORD COUNTY, VA
 03-12-19



Fairbanks & Franklin
 CIVIL ENGINEERING & LAND PLANNING
 805 Main Street • Fredericksburg, VA 22401 • (540) 899-3700

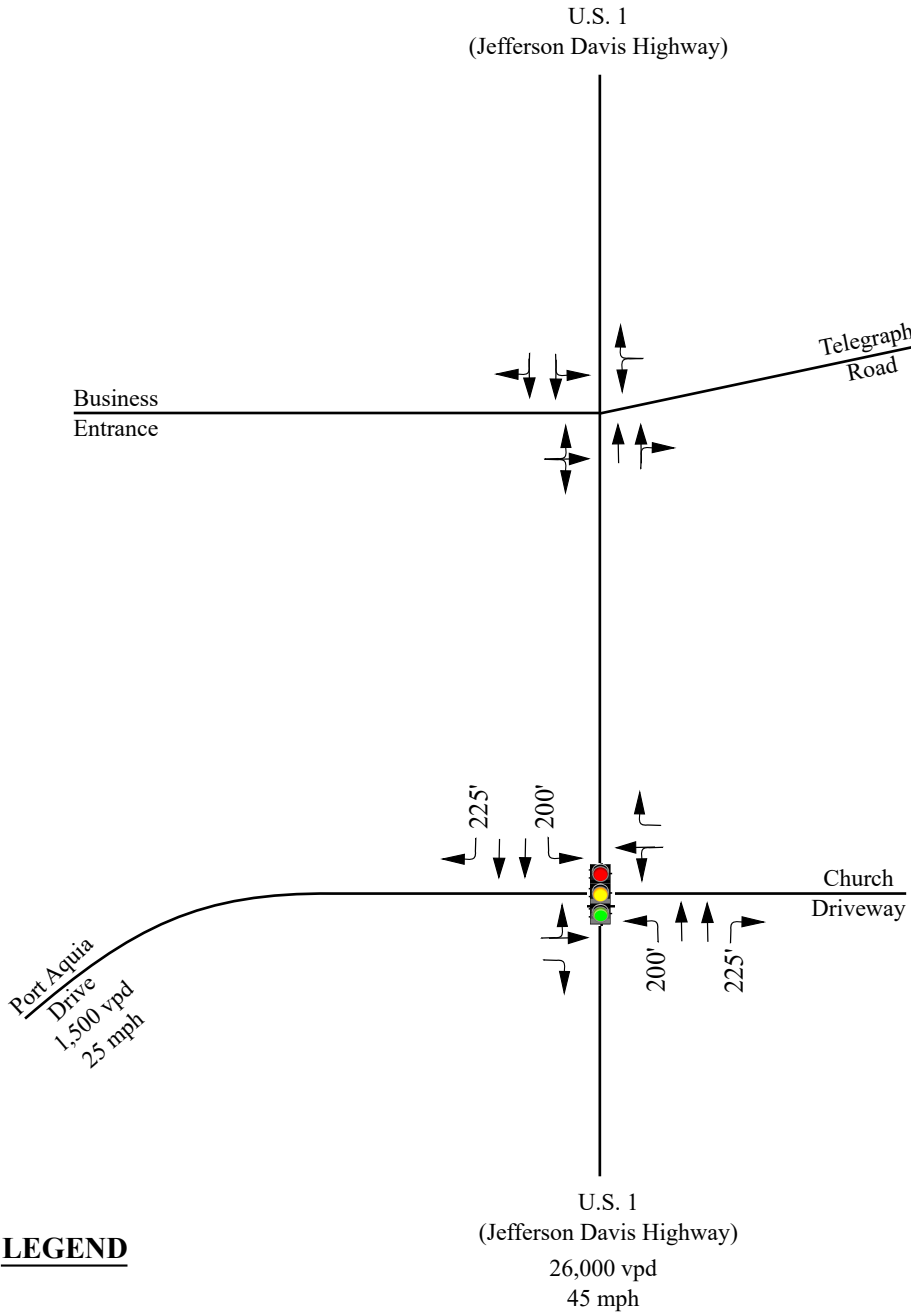


Wawa
 Port Aquia Drive
 Stafford County, Virginia

Preliminary Site Plan

Scale: Not to Scale

Figure 2



LEGEND



Existing Traffic Signal



Existing Lane



Storage (In Feet)



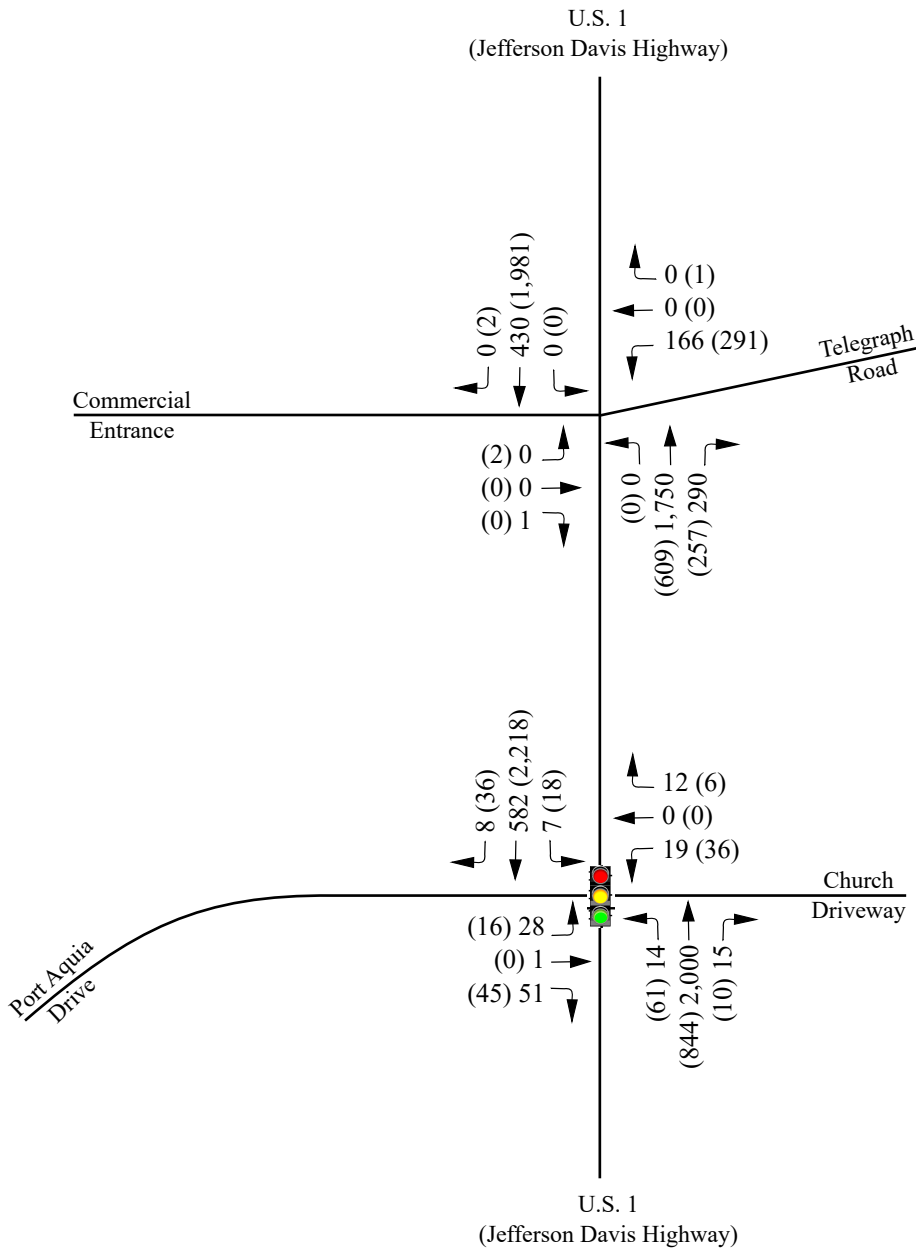
**RAMEY KEMP
&
ASSOCIATES**
TRANSPORTATION ENGINEERS

Wawa
Port Aquia Drive
Stafford County, Virginia

Existing Laneage
Configuration

Scale: Not to Scale

Figure 3



LEGEND

X (Y) AM (PM) Peak Hour

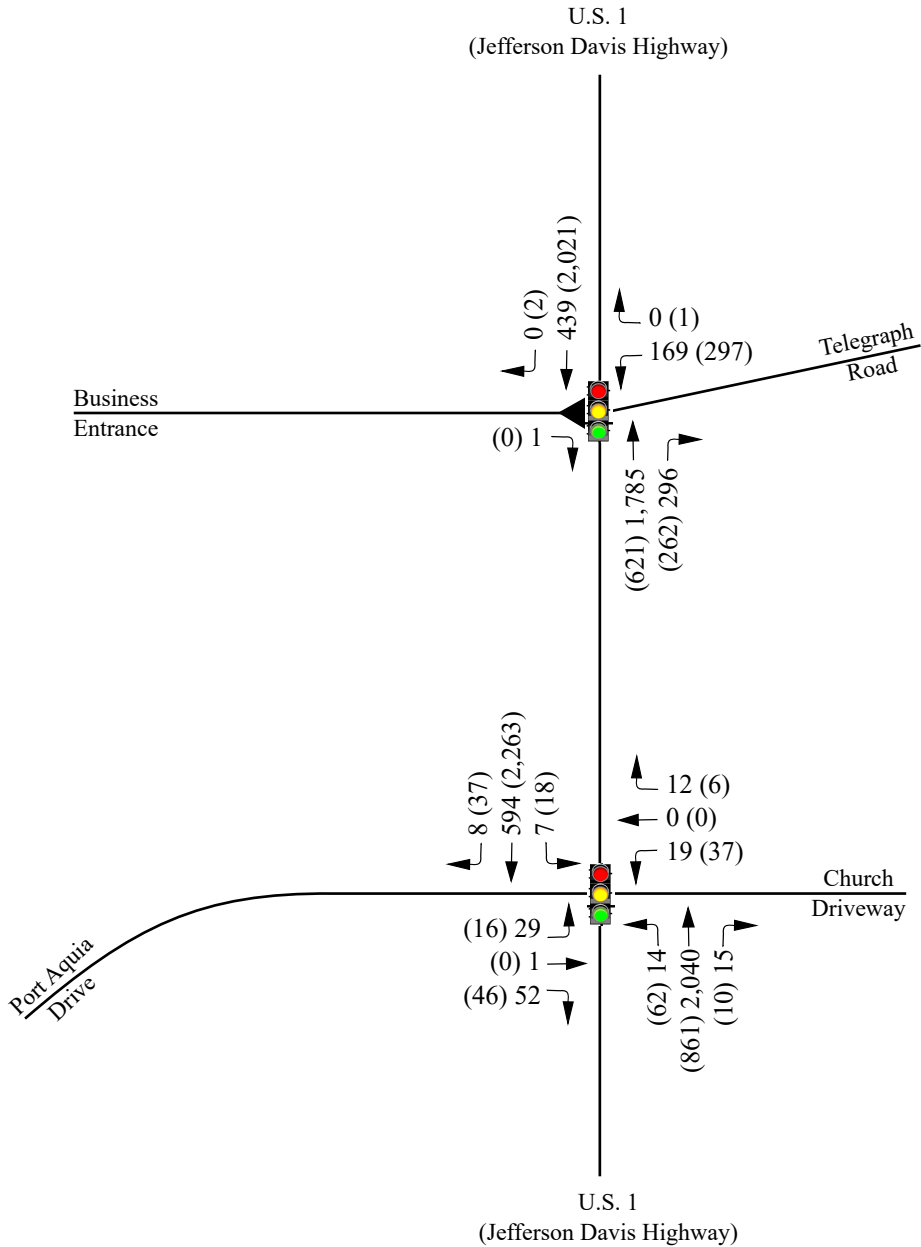


Wawa
Port Aquia Drive
Stafford County, Virginia

Existing (2019)
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 4

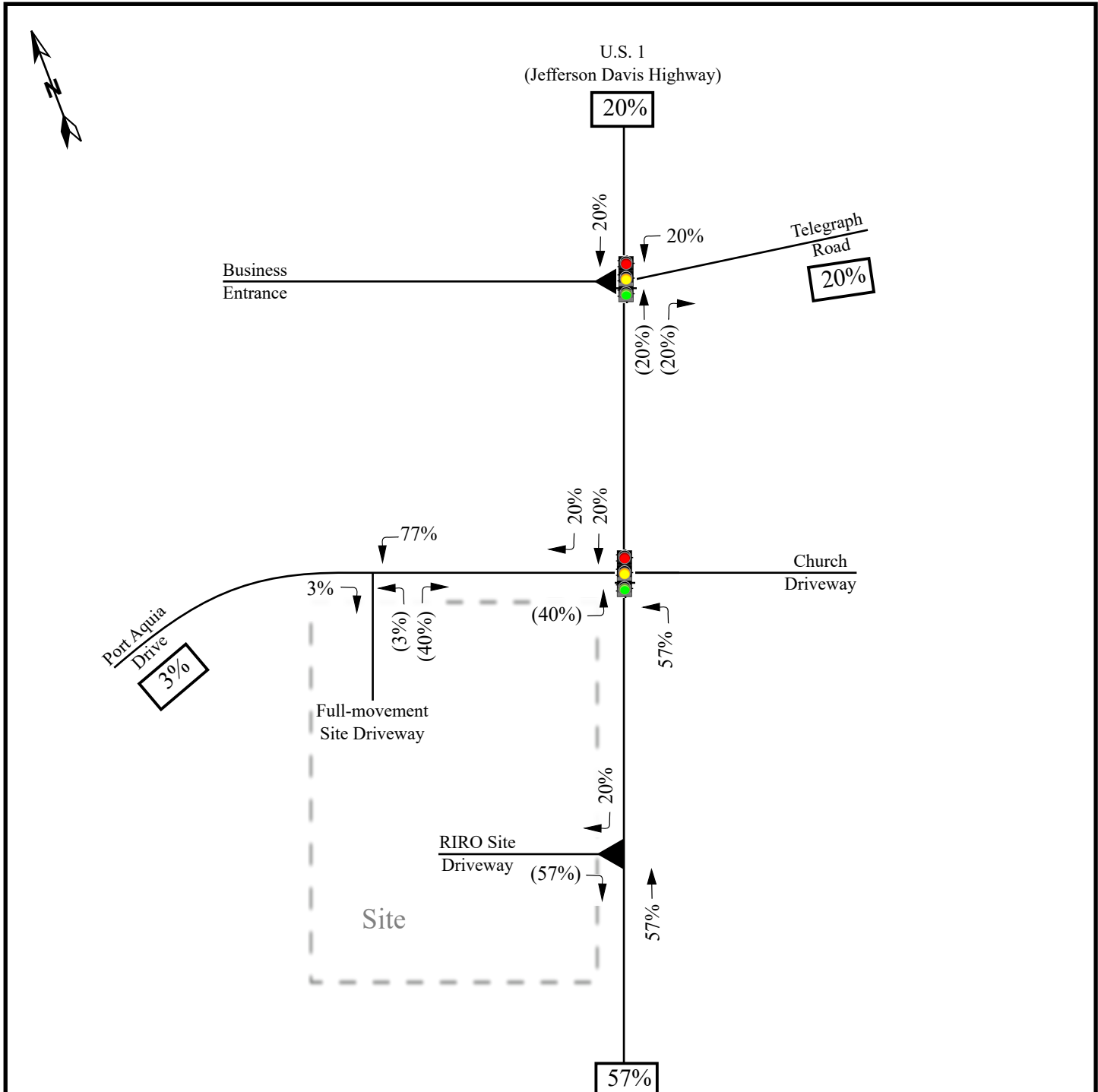


Wawa
Port Aquia Drive
Stafford County, Virginia

No-Build (2021)
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 5



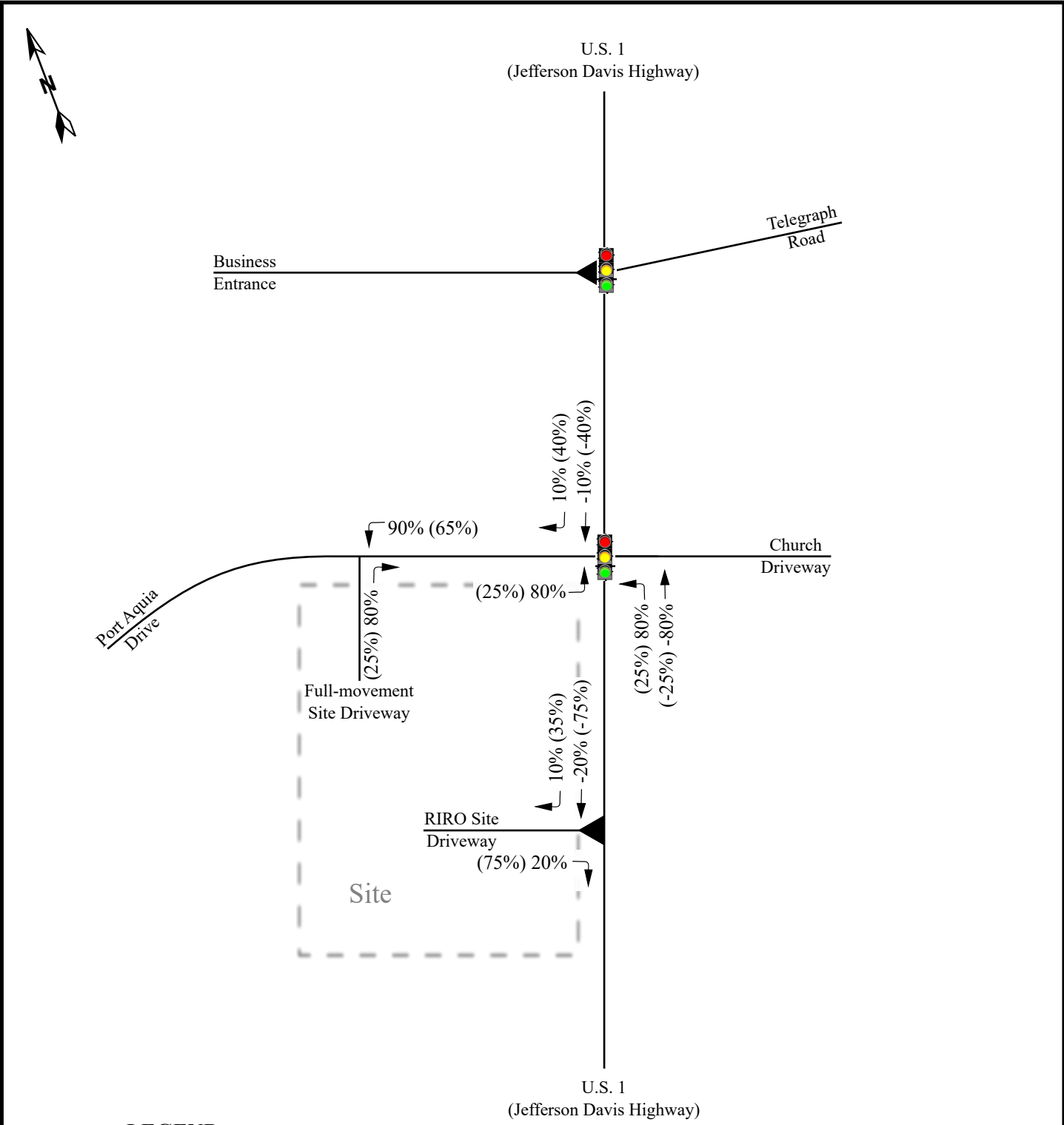
LEGEND



Regional Trip Distribution


X% (Y%) Entering (Exiting) Trip Distribution

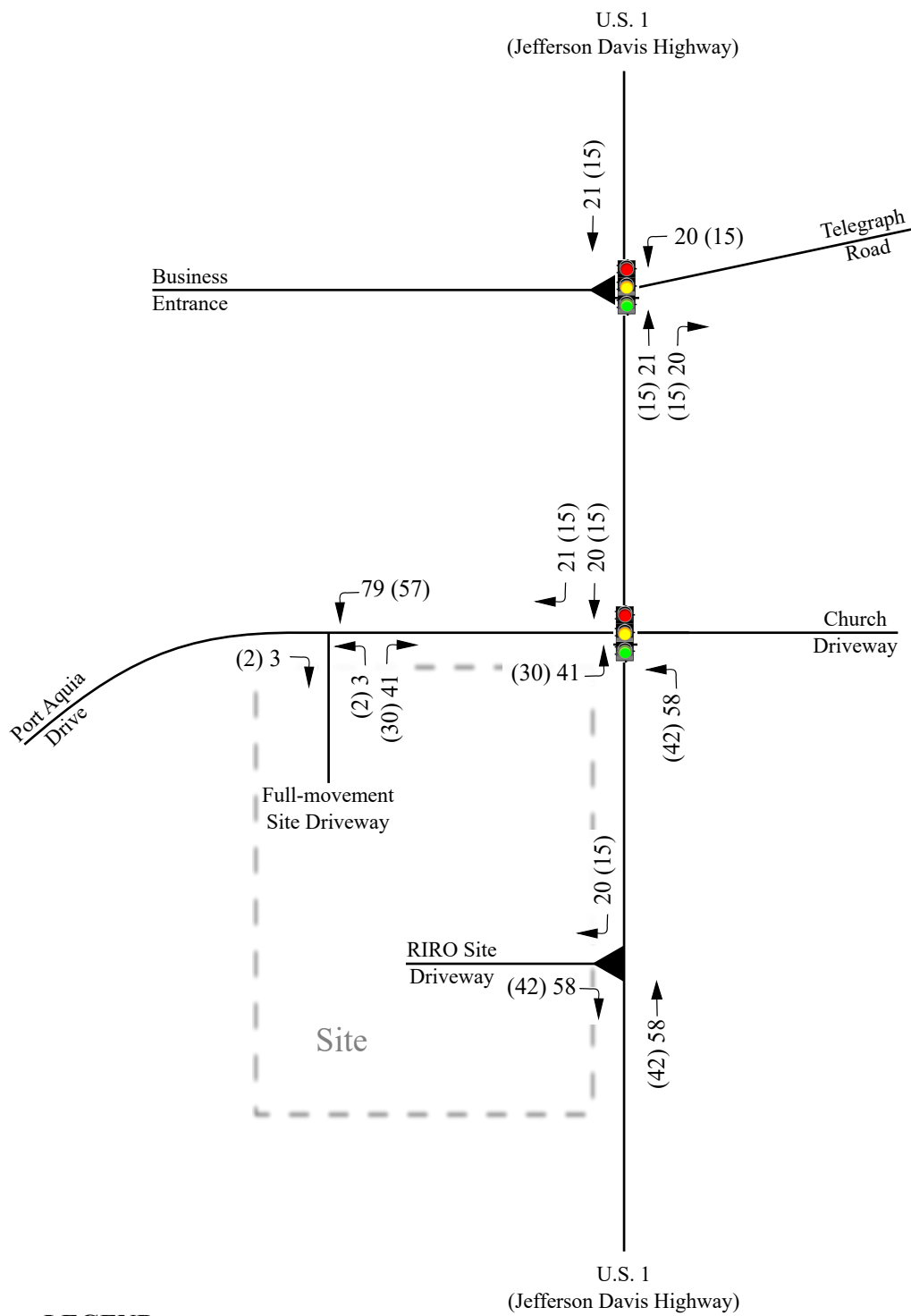
	<p>Wawa Port Aquia Drive Stafford County, Virginia</p>		<p>Primary Site Trip Distribution</p>	
			Scale: Not to Scale	Figure 6



LEGEND

X% (Y%) AM (PM) Trip Distribution

	<p>Wawa Port Aquia Drive Stafford County, Virginia</p>		<p>Pass-By Site Trip Distribution</p>	
			Scale: Not to Scale	Figure 7



LEGEND

X(Y) AM (PM) Peak Hour

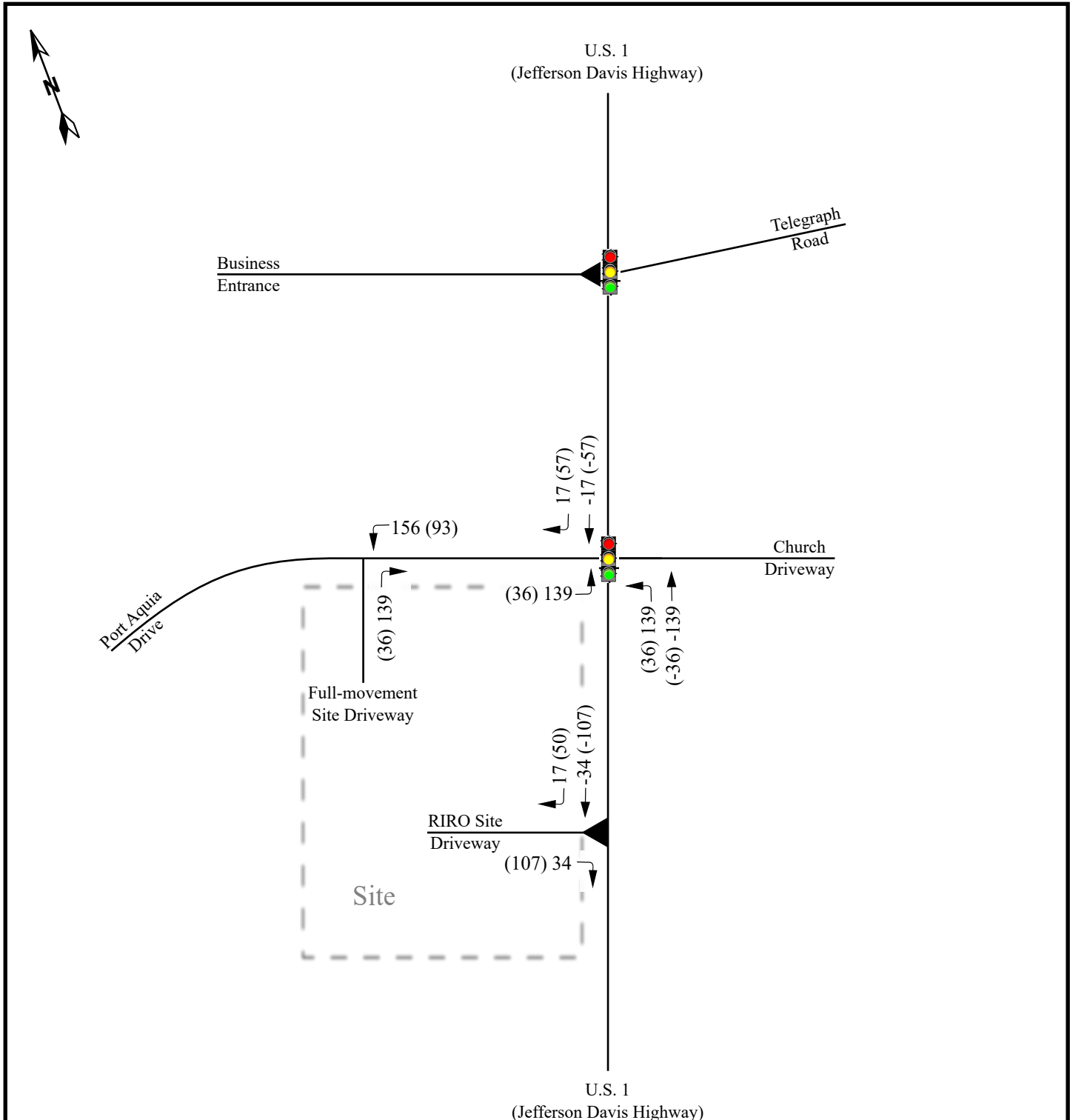


Wawa
Port Aquia Drive
Stafford County, Virginia

Primary
Site Trip Assignment


Scale: Not to Scale

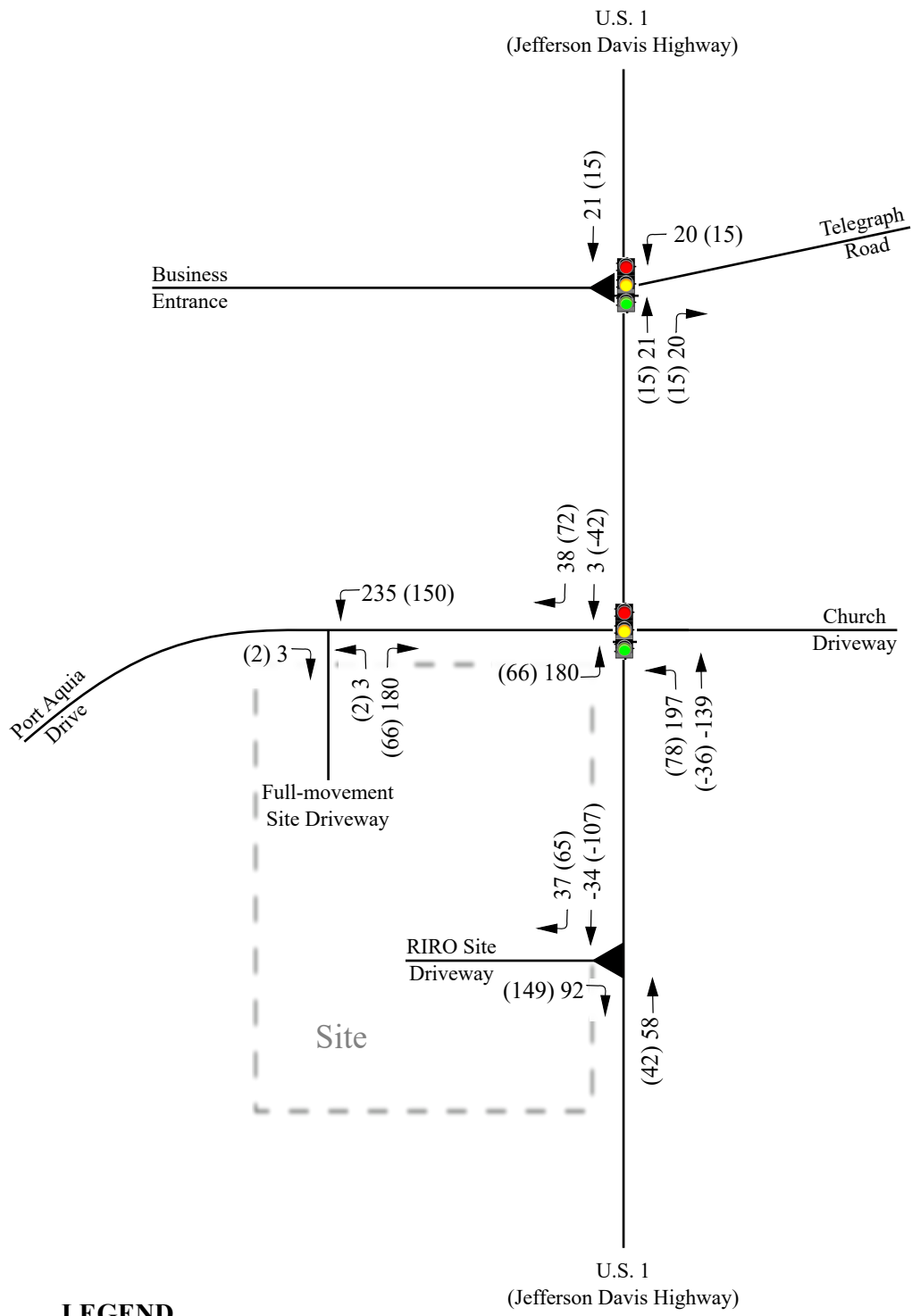
Figure 8



LEGEND

X (Y) AM (PM) Peak Hour

	<p>Wawa Port Aquia Drive Stafford County, Virginia</p>		<p>Pass-By Site Trip Assignment</p>	
			Scale: Not to Scale	Figure 9



LEGEND

X (Y) AM (PM) Peak Hour

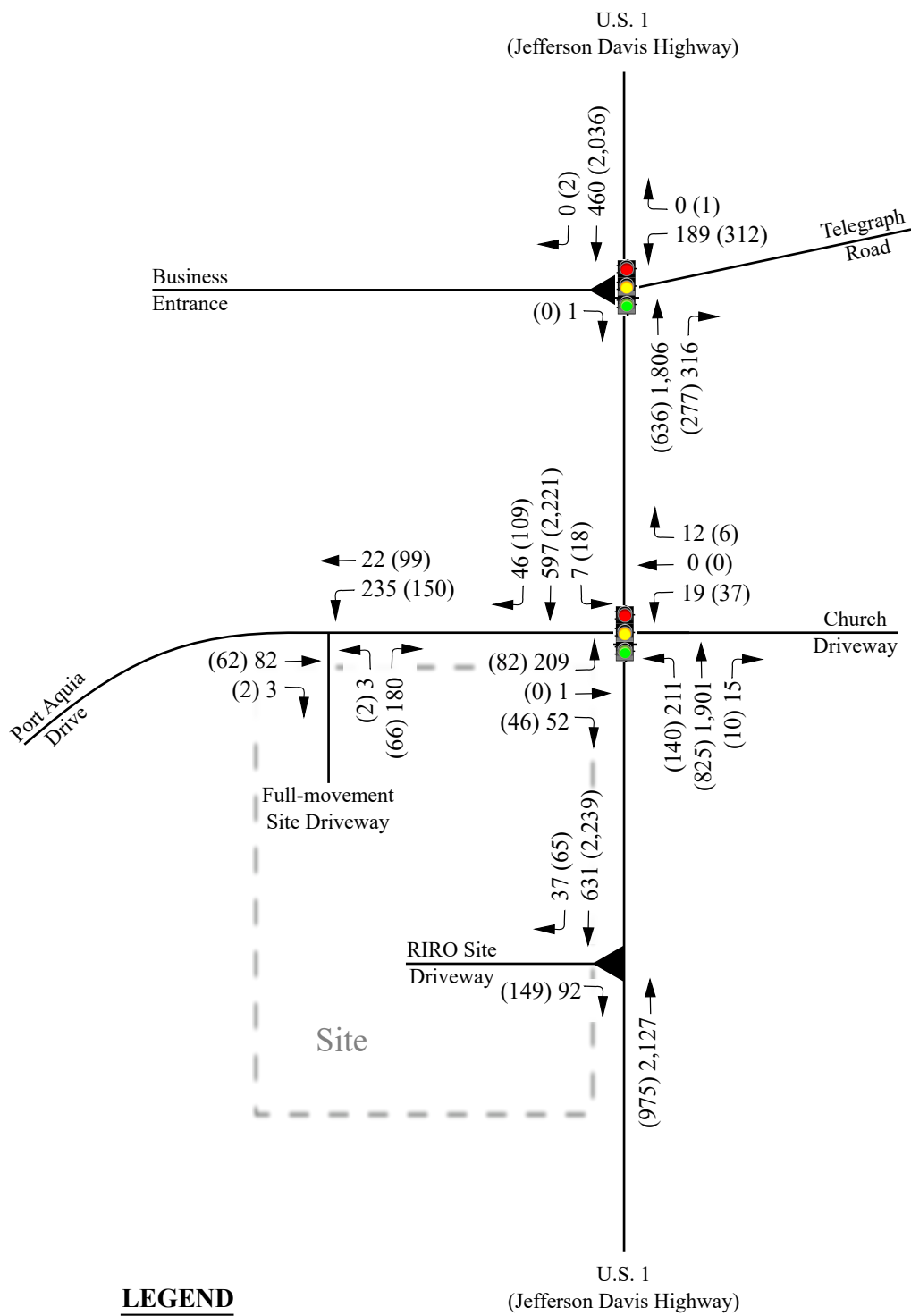


Wawa
Port Aquia Drive
Stafford County, Virginia

Total Site Trips

Scale: Not to Scale

Figure 10

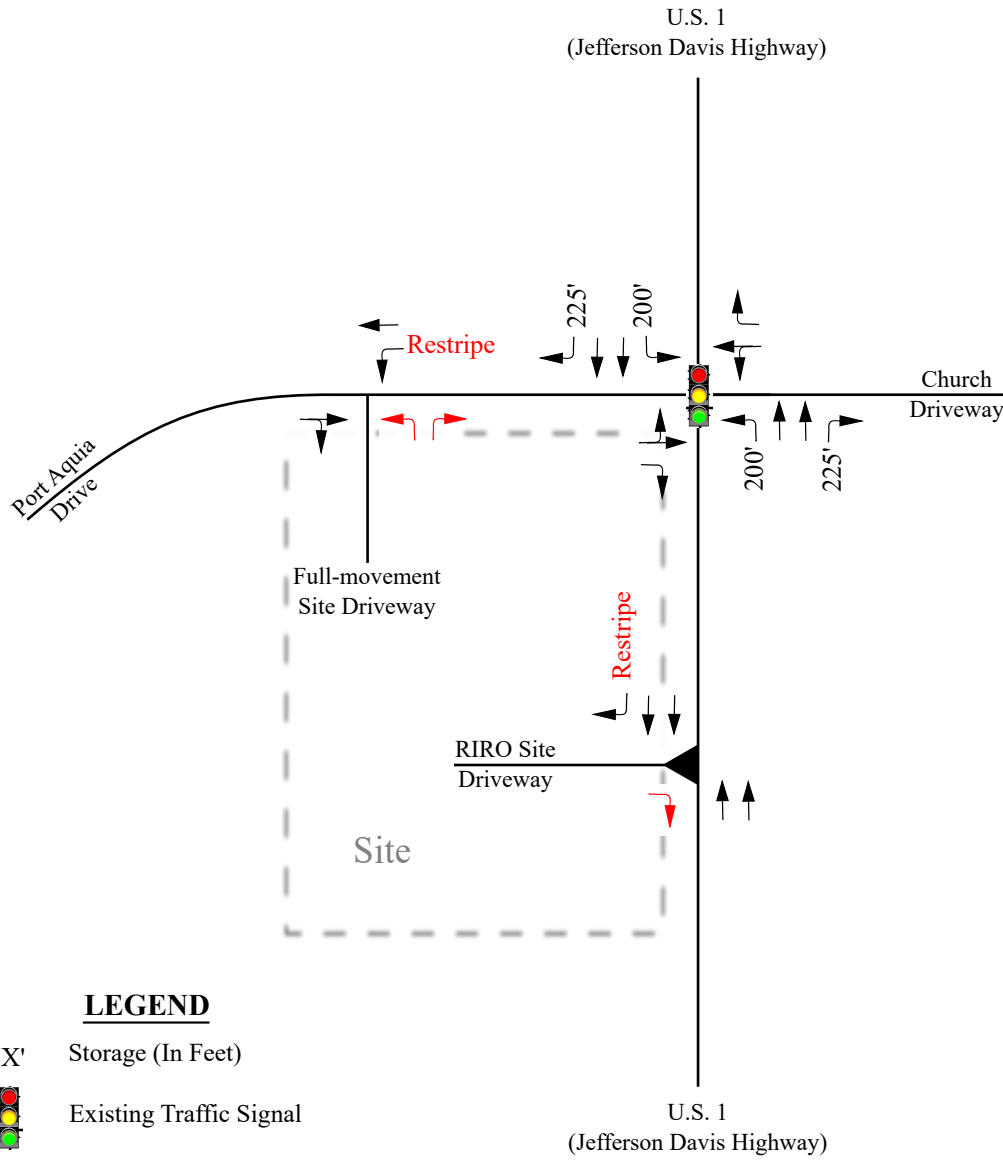


Wawa
Port Aquia Drive
Stafford County, Virginia




Build (2021)
Peak Hour Traffic Volumes


Scale: Not to Scale

Figure 11



LEGEND

- X' Storage (In Feet)
-  Existing Traffic Signal
-  Existing Lane
-  Recommended Lane

	Wawa Port Aquia Drive Stafford County, Virginia	Recommended Lanes	
		Scale: Not to Scale	Figure 12

Peggy Malone & Associates
904-992-8072

File Name : 1-Route 1 and Port Aquia Dr
Site Code :
Start Date : 5/15/2019
Page No : 1

Groups Printed- Cars - Buses - Unit Trucks - Articulated Trucks

Start Time	Rt 1 Southbound					Church Ent/Exit Westbound					Rt 1 Northbound					Port Aquia Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
06:00 AM	0	70	1	0	71	1	0	0	0	1	3	320	0	0	323	3	0	13	0	16	411
06:15 AM	0	76	0	0	76	0	0	3	0	3	1	412	1	0	414	3	0	15	0	18	511
06:30 AM	0	85	1	0	86	0	1	2	0	3	3	400	4	0	407	8	0	3	0	11	507
06:45 AM	1	125	1	0	127	3	0	4	0	7	3	449	3	0	455	5	0	7	0	12	601
Total	1	356	3	0	360	4	1	9	0	14	10	1581	8	0	1599	19	0	38	0	57	2030
07:00 AM	0	121	2	0	123	6	0	4	0	10	3	499	2	0	504	6	0	17	0	23	660
07:15 AM	1	123	3	0	127	5	0	3	0	8	4	526	4	0	534	9	1	16	0	26	695
07:30 AM	0	137	0	0	137	1	0	1	0	2	5	499	6	0	510	8	0	13	0	21	670
07:45 AM	6	121	3	0	130	7	0	4	0	11	2	476	3	0	481	5	0	5	0	10	632
Total	7	502	8	0	517	19	0	12	0	31	14	2000	15	0	2029	28	1	51	0	80	2657
08:00 AM	7	138	1	0	146	25	1	12	0	38	8	415	15	1	439	7	3	14	0	24	647
08:15 AM	6	157	4	0	167	21	0	9	0	30	5	324	6	1	336	3	0	15	0	18	551
08:30 AM	4	160	3	0	167	4	0	2	0	6	8	319	8	1	336	2	0	16	0	18	527
08:45 AM	2	144	4	0	150	0	0	3	0	3	5	418	3	0	426	3	0	7	0	10	589
Total	19	599	12	0	630	50	1	26	0	77	26	1476	32	3	1537	15	3	52	0	70	2314
09:00 AM	1	120	2	0	123	0	1	1	0	2	2	513	4	0	519	2	0	7	0	9	653
09:15 AM	0	91	1	0	92	1	0	1	0	2	1	490	4	1	496	4	0	8	0	12	602
09:30 AM	2	142	1	0	145	14	0	5	0	19	4	379	3	0	386	2	0	11	0	13	563
09:45 AM	1	128	3	0	132	3	0	1	0	4	4	279	5	0	288	1	0	2	0	3	427
Total	4	481	7	0	492	18	1	8	0	27	11	1661	16	1	1689	9	0	28	0	37	2245
10:00 AM	0	131	0	0	131	3	1	1	0	5	4	233	4	0	241	0	0	8	0	8	385
10:15 AM	5	147	1	0	153	6	0	1	0	7	3	208	6	1	218	2	0	5	0	7	385
10:30 AM	1	137	3	0	141	5	0	1	0	6	5	180	5	0	190	2	0	6	0	8	345
10:45 AM	0	157	3	0	160	6	0	1	0	7	5	167	5	0	177	2	0	3	0	5	349
Total	6	572	7	0	585	20	1	4	0	25	17	788	20	1	826	6	0	22	0	28	1464
11:00 AM	2	162	0	0	164	6	0	3	0	9	5	149	3	0	157	1	1	4	0	6	336
11:15 AM	5	193	3	0	201	7	0	3	0	10	6	174	7	0	187	3	0	6	0	9	407
11:30 AM	1	171	3	0	175	6	1	2	0	9	3	188	4	1	196	1	0	7	0	8	388
11:45 AM	0	196	2	0	198	6	1	2	0	9	5	162	2	3	172	2	0	6	0	8	387
Total	8	722	8	0	738	25	2	10	0	37	19	673	16	4	712	7	1	23	0	31	1518
12:00 PM	0	194	4	0	198	4	0	1	0	5	10	180	3	1	194	0	0	6	0	6	403
12:15 PM	0	173	2	0	175	7	0	0	0	7	5	186	0	0	191	3	0	8	0	11	384
12:30 PM	0	174	0	0	174	4	1	3	0	8	7	181	0	0	188	3	0	7	0	10	380
12:45 PM	1	187	1	0	189	3	0	2	0	5	6	183	1	1	191	2	0	11	0	13	398
Total	1	728	7	0	736	18	1	6	0	25	28	730	4	2	764	8	0	32	0	40	1565
01:00 PM	2	146	1	0	149	2	0	2	0	4	6	184	3	1	194	1	0	4	0	5	352
01:15 PM	0	181	2	0	183	0	0	1	0	1	14	155	1	0	170	0	0	12	0	12	366
01:30 PM	0	181	1	0	182	1	0	2	0	3	5	156	0	1	162	2	0	10	0	12	359
01:45 PM	0	202	4	0	206	5	0	1	0	6	6	149	1	0	156	1	0	7	0	8	376
Total	2	710	8	0	720	8	0	6	0	14	31	644	5	2	682	4	0	33	0	37	1453
02:00 PM	0	209	2	0	211	1	0	0	0	1	4	160	1	0	165	0	0	5	0	5	382
02:15 PM	2	216	0	0	218	1	0	1	0	2	8	149	2	0	159	1	0	10	0	11	390
02:30 PM	3	209	3	0	215	2	1	1	0	4	13	191	2	1	207	3	0	8	0	11	437
02:45 PM	1	295	4	0	300	2	0	2	0	4	15	159	11	1	186	4	0	9	0	13	503
Total	6	929	9	0	944	6	1	4	0	11	40	659	16	2	717	8	0	32	0	40	1712
03:00 PM	8	332	6	0	346	4	0	2	0	6	9	172	6	0	187	1	2	5	0	8	547
03:15 PM	5	304	3	0	312	43	3	10	0	56	6	174	9	0	189	2	2	11	0	15	572
03:30 PM	3	396	8	0	407	14	1	2	0	17	15	165	4	0	184	1	0	11	0	12	620
03:45 PM	5	377	9	1	392	7	0	7	0	14	11	187	4	0	202	3	0	9	0	12	620
Total	21	1409	26	1	1457	68	4	21	0	93	41	698	23	0	762	7	4	36	0	47	2359
04:00 PM	4	573	9	0	586	12	0	3	0	15	17	173	2	0	192	4	0	17	0	21	814
04:15 PM	3	531	3	0	537	5	0	0	0	5	12	169	2	1	184	2	0	9	0	11	737
04:30 PM	8	540	11	0	559	12	0	2	0	14	11	179	4	0	194	3	0	10	0	13	780
04:45 PM	3	574	13	0	590	7	0	1	0	8	21	186	2	2	211	7	0	9	0	16	825
Total	18	2218	36	0	2272	36	0	6	0	42	61	707	10	3	781	16	0	45	0	61	3156
05:00 PM	5	522	9	0	536	12	1	2	0	15	19	194	1	4	218	5	0	18	0	23	792
05:15 PM	4	499	12	0	515	3	0	1	0	4	11	204	2	1	218	5	0	9	0	14	751
05:30 PM	3	421	9	0	433	4	0	1	0	5	18	166	2	2	188	4	0	16	0	20	646
05:45 PM	1	352	12	1	366	3	2	0	0	5	14	196	5	1	216	3	2	3	0	8	595
Total	13	1794	42	1	1850	22	3	4	0	29	62	760	10	8	840	17	2	46	0	65	2784
06:00 PM	2	357	7	0	366	6	0	0	0	6	6	141	1	1	149	0	0	3	0	3	524

Peggy Malone & Associates

904-992-8072

File Name : 1-Route 1 and Port Aquia Dr
 Site Code :
 Start Date : 5/15/2019
 Page No : 2

Groups Printed- Cars - Buses - Unit Trucks - Articulated Trucks

Start Time	Rt 1 Southbound					Church Ent/Exit Westbound					Rt 1 Northbound					Port Aquia Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
06:15 PM	2	249	8	0	259	9	0	3	0	12	10	151	3	0	164	3	0	11	0	14	449
06:30 PM	0	238	4	0	242	3	0	4	0	7	12	175	1	0	188	0	0	5	0	5	442
06:45 PM	0	230	5	0	235	1	0	0	0	1	17	150	0	2	169	3	0	6	0	9	414
Total	4	1074	24	0	1102	19	0	7	0	26	45	617	5	3	670	6	0	25	0	31	1829
Grand Total	110	12094	197	2	12403	313	15	123	0	451	405	12994	180	29	13608	150	11	463	0	624	27086
Apprch %	0.9	97.5	1.6	0		69.4	3.3	27.3	0		3	95.5	1.3	0.2		24	1.8	74.2	0		
Total %	0.4	44.7	0.7	0	45.8	1.2	0.1	0.5	0	1.7	1.5	48	0.7	0.1	50.2	0.6	0	1.7	0	2.3	
Cars	106	11805	188	2	12101	308	11	119	0	438	392	12630	178	28	13228	140	10	449	0	599	26366
% Cars	96.4	97.6	95.4	100	97.6	98.4	73.3	96.7	0	97.1	96.8	97.2	98.9	96.6	97.2	93.3	90.9	97	0	96	97.3
Buses	3	93	7	0	103	4	3	3	0	10	9	98	1	0	108	8	1	10	0	19	240
% Buses	2.7	0.8	3.6	0	0.8	1.3	20	2.4	0	2.2	2.2	0.8	0.6	0	0.8	5.3	9.1	2.2	0	3	0.9
Single-Unit Trucks	1	163	2	0	166	1	1	1	0	3	4	214	1	1	220	2	0	4	0	6	395
% Single-Unit Trucks	0.9	1.3	1	0	1.3	0.3	6.7	0.8	0	0.7	1	1.6	0.6	3.4	1.6	1.3	0	0.9	0	1	1.5
Articulated Trucks	0	33	0	0	33	0	0	0	0	0	0	52	0	0	52	0	0	0	0	0	85
% Articulated Trucks	0	0.3	0	0	0.3	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.3

Start Time	Rt 1 Southbound				Church Ent/Exit Westbound				Rt 1 Northbound				Port Aquia Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	121	2	123	6	0	4	10	3	499	2	504	6	0	17	23	660
07:15 AM	1	123	3	127	5	0	3	8	4	526	4	534	9	1	16	26	695
07:30 AM	0	137	0	137	1	0	1	2	5	499	6	510	8	0	13	21	670
07:45 AM	6	121	3	130	7	0	4	11	2	476	3	481	5	0	5	10	632
Total Volume	7	502	8	517	19	0	12	31	14	2000	15	2029	28	1	51	80	2657
% App. Total	1.4	97.1	1.5		61.3	0	38.7		0.7	98.6	0.7		35	1.2	63.8		
PHF	.292	.916	.667	.943	.679	.000	.750	.705	.700	.951	.625	.950	.778	.250	.750	.769	.956

Start Time	Rt 1 Southbound				Church Ent/Exit Westbound				Rt 1 Northbound				Port Aquia Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	573	9	586	12	0	3	15	17	173	2	192	4	0	17	21	814
04:15 PM	3	531	3	537	5	0	0	5	12	169	2	183	2	0	9	11	736
04:30 PM	8	540	11	559	12	0	2	14	11	179	4	194	3	0	10	13	780
04:45 PM	3	574	13	590	7	0	1	8	21	186	2	209	7	0	9	16	823
Total Volume	18	2218	36	2272	36	0	6	42	61	707	10	778	16	0	45	61	3153
% App. Total	0.8	97.6	1.6		85.7	0	14.3		7.8	90.9	1.3		26.2	0	73.8		
PHF	.563	.966	.692	.963	.750	.000	.500	.700	.726	.950	.625	.931	.571	.000	.662	.726	.958

AM Peak Hour



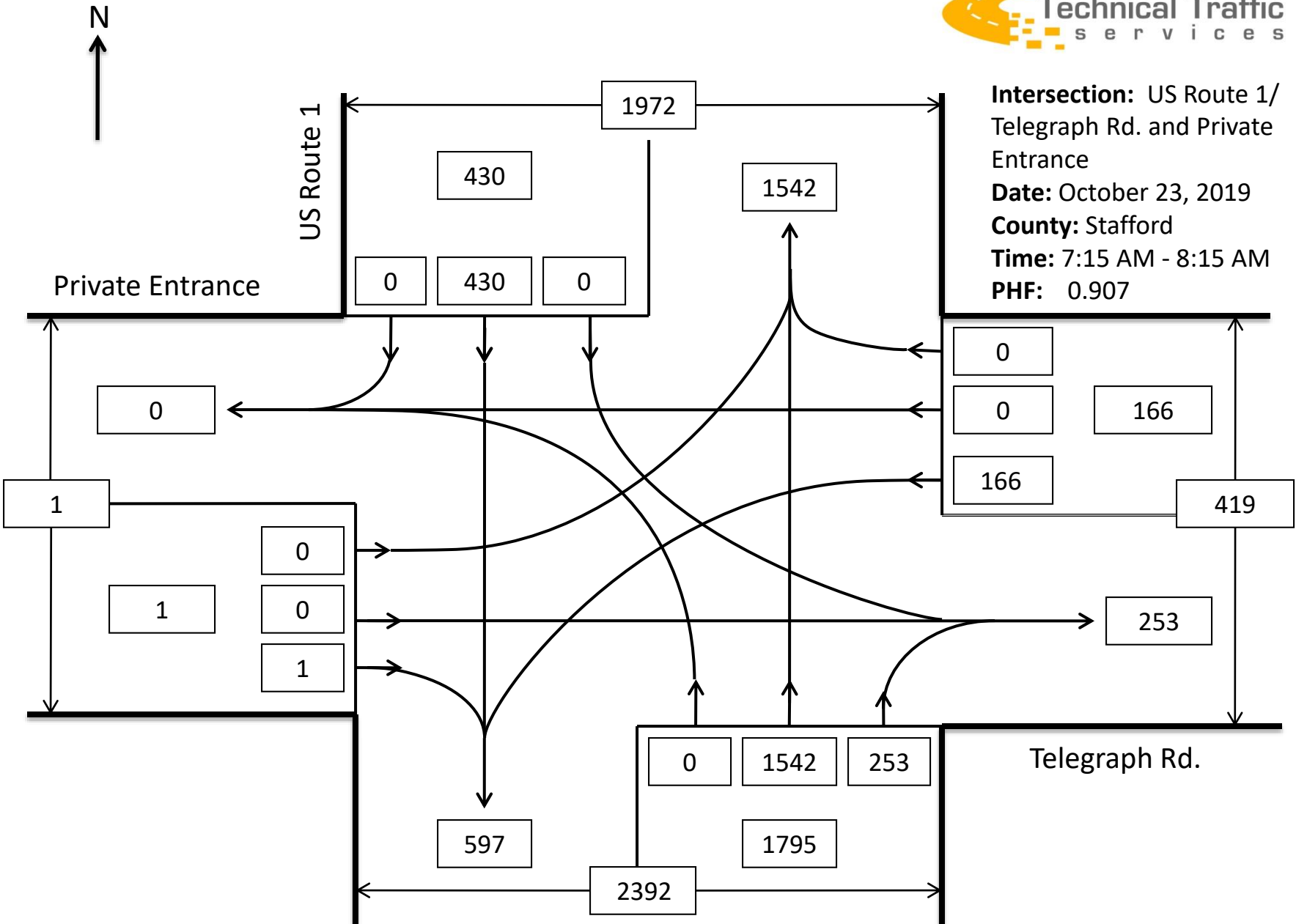
Intersection: US Route 1/
Telegraph Rd. and Private
Entrance

Date: October 23, 2019

County: Stafford

Time: 7:15 AM - 8:15 AM

PHF: 0.907



PM Peak Hour



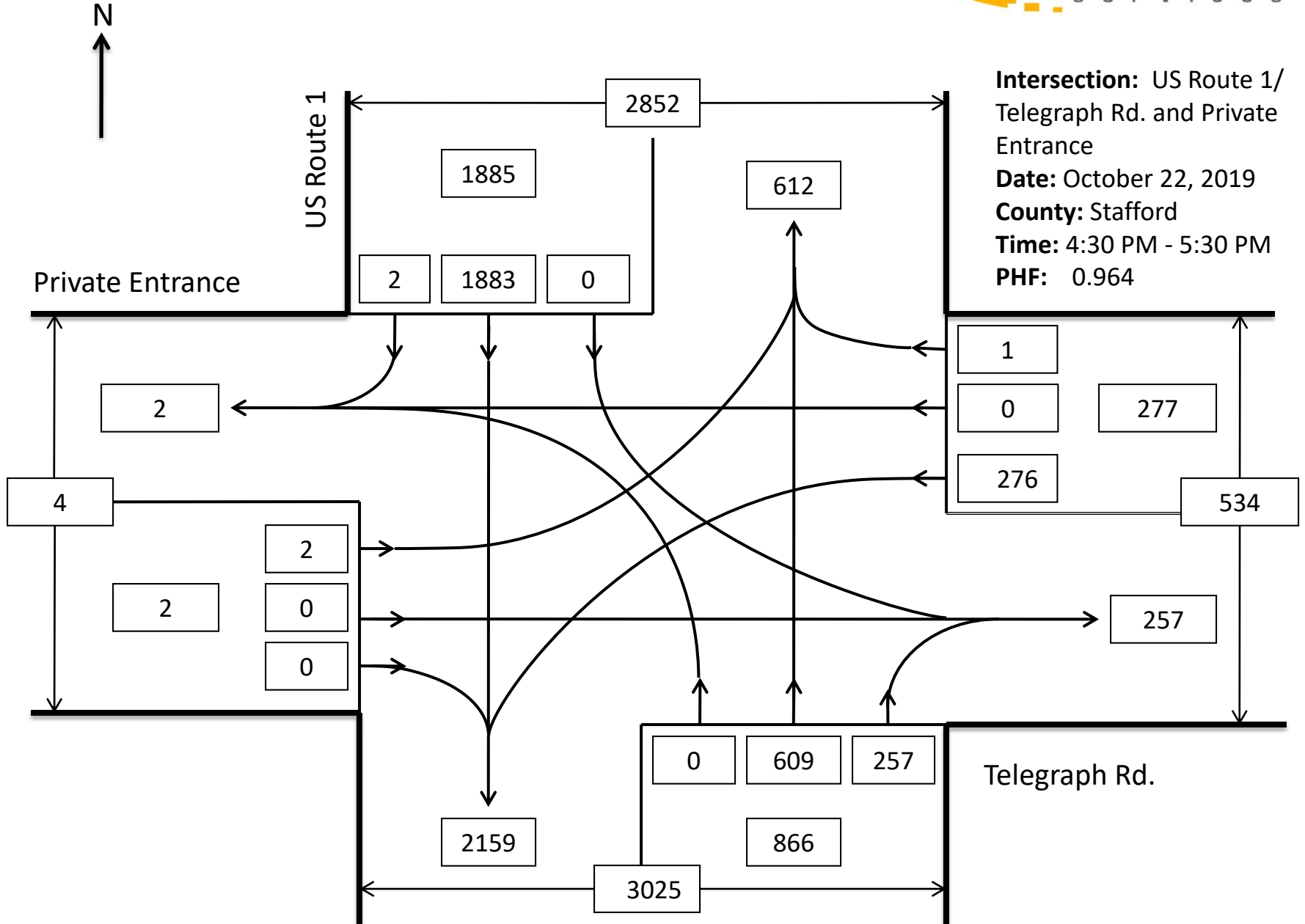
Intersection: US Route 1/
Telegraph Rd. and Private
Entrance

Date: October 22, 2019

County: Stafford

Time: 4:30 PM - 5:30 PM

PHF: 0.964



Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

Existing (2019) Conditions
 Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	51	19	1	12	14	2000	15	7	582	8
Future Volume (vph)	28	1	51	19	1	12	14	2000	15	7	582	8
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1777	1583	0	1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.718			0.714		0.406			0.058		
Satd. Flow (perm)	0	1337	1583	0	1330	1583	756	3539	1583	108	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			80			80			80
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			484	
Travel Time (s)		12.1			6.8			6.1			7.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	55	0	21	13	15	2151	16	8	626	9
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	18.6	18.6	13.0	17.8	17.8
Total Split (s)	18.0	18.0	18.0	18.0	18.0	18.0	29.0	103.0	103.0	29.0	103.0	103.0
Total Split (%)	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	19.3%	68.7%	68.7%	19.3%	68.7%	68.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		8.7	8.7		8.7	8.7	128.4	129.3	129.3	127.1	127.2	127.2
Actuated g/C Ratio		0.06	0.06		0.06	0.06	0.86	0.86	0.86	0.85	0.85	0.85
v/c Ratio		0.40	0.33		0.27	0.08	0.02	0.71	0.01	0.05	0.21	0.01
Control Delay		82.4	10.4		75.5	0.9	2.1	7.4	0.0	2.9	3.5	0.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		82.4	10.4		75.5	0.9	2.1	7.4	0.0	2.9	3.5	0.0
LOS		F	B		E	A	A	A	A	A	A	A
Approach Delay		36.3			47.0			7.3			3.4	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)		30	0		20	0	2	323	0	1	42	0
Queue Length 95th (ft)		66	22		50	0	6	730	0	4	107	0
Internal Link Dist (ft)		362			169			325			404	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		101	194		101	194	799	3050	1375	337	3000	1354
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

Existing (2019) Conditions
 Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.31	0.28		0.21	0.07	0.02	0.71	0.01	0.02	0.21	0.01

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 44 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 7.7
 Intersection Capacity Utilization 80.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

Existing (2019) Conditions
 Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	45	36	1	6	61	844	10	18	2218	36
Future Volume (vph)	16	1	45	36	1	6	61	844	10	18	2218	36
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1779	1583	0	1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.709			0.718		0.031			0.312		
Satd. Flow (perm)	0	1321	1583	0	1337	1583	58	3539	1583	581	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75			75			75			75
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			484	
Travel Time (s)		12.1			6.8			6.1			7.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	48	0	40	6	66	908	11	19	2385	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	19.6	19.6	13.0	18.8	18.8
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	20.0	116.0	116.0	20.0	116.0	116.0
Total Split (%)	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	12.5%	72.5%	72.5%	12.5%	72.5%	72.5%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		10.2	10.2		10.2	10.2	135.7	132.7	132.7	129.6	125.0	125.0
Actuated g/C Ratio		0.06	0.06		0.06	0.06	0.85	0.83	0.83	0.81	0.78	0.78
v/c Ratio		0.21	0.28		0.47	0.04	0.51	0.31	0.01	0.04	0.86	0.03
Control Delay		75.4	8.3		89.1	0.3	38.1	4.9	0.0	2.7	18.0	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		75.4	8.3		89.1	0.3	38.1	4.9	0.0	2.7	18.0	0.1
LOS		E	A		F	A	D	A	A	A	B	A
Approach Delay		26.6			77.5			7.1			17.6	
Approach LOS		C			E			A			B	
Queue Length 50th (ft)		18	0		41	0	19	134	0	2	816	0
Queue Length 95th (ft)		46	17		82	0	72	185	0	8	1209	1
Internal Link Dist (ft)		362			169			325			404	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		143	238		145	238	185	2934	1325	593	2765	1253
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

Existing (2019) Conditions
 Timing Plan: PM Peak Hour

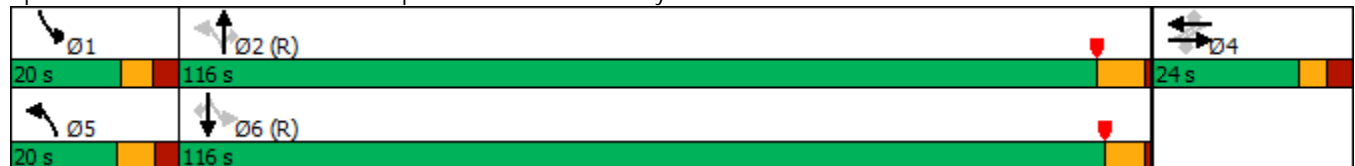
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.13	0.20		0.28	0.03	0.36	0.31	0.01	0.03	0.86	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 13 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 15.6
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
1: U.S. 1 & Port Aquia Drive/Church Driveway

No-Build (2021) Conditions
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1	52	19	1	12	14	2040	15	7	594	8
Future Volume (vph)	29	1	52	19	1	12	14	2040	15	7	594	8
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1777	1583	0	1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.717			0.713		0.402			0.055		
Satd. Flow (perm)	0	1336	1583	0	1328	1583	749	3539	1583	102	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			80			80			80
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			907	
Travel Time (s)		12.1			6.8			6.1			13.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	56	0	21	13	15	2194	16	8	639	9
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	18.6	18.6	13.0	17.8	17.8
Total Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	121.0	121.0	13.0	121.0	121.0
Total Split (%)	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%	8.7%	80.7%	80.7%	8.7%	80.7%	80.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		8.1	8.1		8.1	8.1	128.9	129.9	129.9	127.8	127.9	127.9
Actuated g/C Ratio		0.05	0.05		0.05	0.05	0.86	0.87	0.87	0.85	0.85	0.85
v/c Ratio		0.44	0.35		0.30	0.08	0.02	0.72	0.01	0.05	0.21	0.01
Control Delay		87.5	11.3		78.2	1.0	2.0	7.2	0.0	2.4	3.3	0.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		87.5	11.3		78.2	1.0	2.0	7.2	0.0	2.4	3.3	0.2
LOS		F	B		E	A	A	A	A	A	A	A
Approach Delay		39.0			48.7			7.1			3.2	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)		31	0		20	0	2	342	0	1	30	0
Queue Length 95th (ft)		69	23		51	0	5	719	0	m4	141	m1
Internal Link Dist (ft)		362			169			325			827	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		83	174		83	174	681	3063	1381	153	3016	1361
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

No-Build (2021) Conditions
 Timing Plan: AM Peak Hour

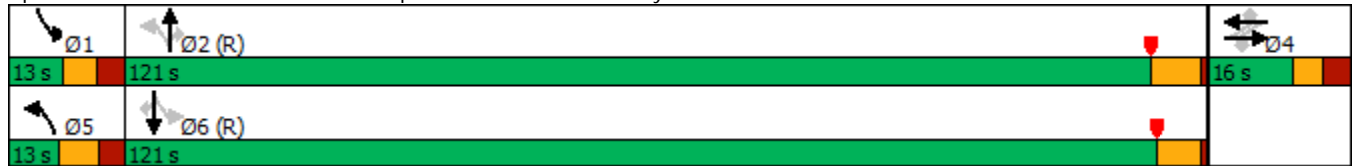
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.39	0.32		0.25	0.07	0.02	0.72	0.01	0.05	0.21	0.01

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 44 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 7.7
 Intersection Capacity Utilization 81.2%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
1: U.S. 1 & Port Aquia Drive/Church Driveway

No-Build (2021) Conditions

Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	46	37	1	6	62	861	10	18	2263	37
Future Volume (vph)	16	1	46	37	1	6	62	861	10	18	2263	37
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1779	1583	0	1775	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.708			0.718		0.031			0.305		
Satd. Flow (perm)	0	1319	1583	0	1337	1583	58	3539	1583	568	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75			75			75			75
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			907	
Travel Time (s)		12.1			6.8			6.1			13.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	49	0	41	6	67	926	11	19	2433	40
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	18.6	18.6	13.0	17.8	17.8
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	20.0	116.0	116.0	20.0	116.0	116.0
Total Split (%)	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	12.5%	72.5%	72.5%	12.5%	72.5%	72.5%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		10.3	10.3		10.3	10.3	135.6	132.5	132.5	129.4	124.8	124.8
Actuated g/C Ratio		0.06	0.06		0.06	0.06	0.85	0.83	0.83	0.81	0.78	0.78
v/c Ratio		0.21	0.28		0.48	0.03	0.52	0.32	0.01	0.04	0.88	0.03
Control Delay		75.1	8.8		89.2	0.3	38.6	5.0	0.0	1.7	16.8	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay		75.1	8.8		89.2	0.3	38.6	5.0	0.0	1.7	17.1	0.1
LOS		E	A		F	A	D	A	A	A	B	A
Approach Delay		26.6			77.8			7.2			16.7	
Approach LOS		C			E			A			B	
Queue Length 50th (ft)		18	0		42	0	20	138	0	2	1053	0
Queue Length 95th (ft)		46	19		84	0	75	192	0	m3	#1390	m0
Internal Link Dist (ft)		362			169			325			827	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		143	238		145	238	184	2931	1324	582	2760	1251
Starvation Cap Reductn		0	0		0	0	0	0	0	0	46	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

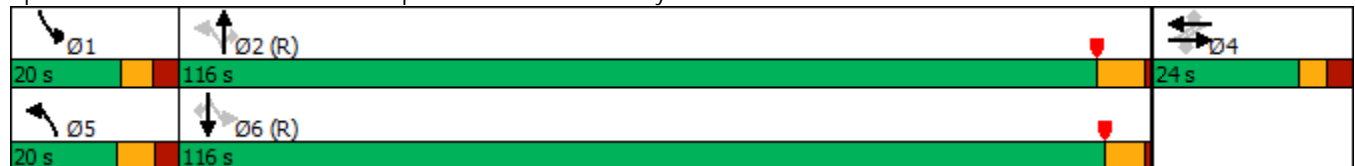
No-Build (2021) Conditions
 Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.13	0.21		0.28	0.03	0.36	0.32	0.01	0.03	0.90	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 13 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 15.0
 Intersection Capacity Utilization 86.7%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
1: U.S. 1 & Port Aquia Drive/Church Driveway

Build (2021) Conditions
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	1	52	19	1	12	211	1901	15	7	597	46
Future Volume (vph)	209	1	52	19	1	12	211	1901	15	7	597	46
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1775	1583	0	1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.712			0.584		0.346			0.043		
Satd. Flow (perm)	0	1326	1583	0	1088	1583	645	3539	1583	80	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77			77			77			77
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			907	
Travel Time (s)		12.1			6.8			6.1			13.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	56	0	21	13	227	2044	16	8	642	49
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	18.6	18.6	13.0	17.8	17.8
Total Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	18.0	101.0	101.0	13.0	96.0	96.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	67.3%	67.3%	8.7%	64.0%	64.0%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		27.9	27.9		27.9	27.9	107.6	106.3	106.3	96.6	92.1	92.1
Actuated g/C Ratio		0.19	0.19		0.19	0.19	0.72	0.71	0.71	0.64	0.61	0.61
v/c Ratio		0.92	0.16		0.10	0.04	0.42	0.82	0.01	0.07	0.30	0.05
Control Delay		99.0	5.5		51.2	0.2	9.5	19.7	0.0	6.6	11.7	0.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay		99.0	5.5		51.2	0.2	9.5	20.2	0.0	6.6	11.7	0.4
LOS		F	A		D	A	A	C	A	A	B	A
Approach Delay		80.4			31.7			19.0			10.8	
Approach LOS		F			C			B			B	
Queue Length 50th (ft)		217	0		17	0	68	647	0	2	178	2
Queue Length 95th (ft)		#369	22		43	0	99	1014	0	m4	125	m0
Internal Link Dist (ft)		362			169			325			827	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		259	372		213	372	541	2507	1144	119	2174	1001
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

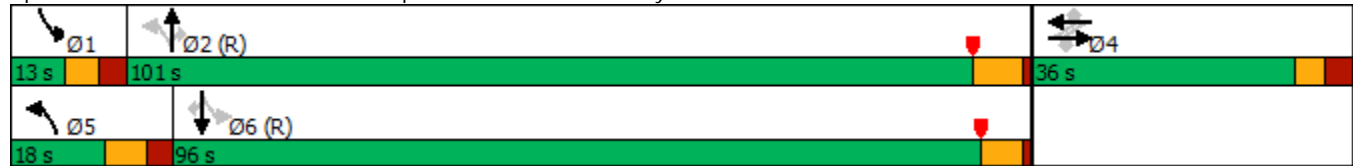
Build (2021) Conditions
 Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	130	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.87	0.15		0.10	0.03	0.42	0.86	0.01	0.07	0.30	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 103 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 22.6
 Intersection Capacity Utilization 91.8%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
2: U.S. 1 & RIRO Driveway

Build (2021) Conditions
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	↑
Traffic Vol, veh/h	0	92	0	2127	631	37
Future Vol, veh/h	0	92	0	2127	631	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	100	0	2312	686	40

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	343	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	653	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	653	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 653	-	-
HCM Lane V/C Ratio	- 0.153	-	-
HCM Control Delay (s)	- 11.5	-	-
HCM Lane LOS	- B	-	-
HCM 95th %tile Q(veh)	- 0.5	-	-

Wawa - Port Aquia Drive
 3: Full-Movement Driveway & Port Aquia Drive

Build (2021) Conditions
 Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	82	3	235	22	3	180
Future Vol, veh/h	82	3	235	22	3	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	89	3	255	24	3	196

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	92	0	625 91
Stage 1	-	-	-	-	91 -
Stage 2	-	-	-	-	534 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1503	-	449 967
Stage 1	-	-	-	-	933 -
Stage 2	-	-	-	-	588 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1503	-	373 967
Mov Cap-2 Maneuver	-	-	-	-	373 -
Stage 1	-	-	-	-	933 -
Stage 2	-	-	-	-	488 -

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	373	967	-	-	1503	-
HCM Lane V/C Ratio	0.009	0.202	-	-	0.17	-
HCM Control Delay (s)	14.7	9.7	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.8	-	-	0.6	-

Wawa - Port Aquia Drive
1: U.S. 1 & Port Aquia Drive/Church Driveway

Build (2021) Conditions
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	1	46	37	1	6	140	825	10	18	2221	109
Future Volume (vph)	82	1	46	37	1	6	140	825	10	18	2221	109
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		225	200		225
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1775	1583	0	1775	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.698			0.627		0.034			0.321		
Satd. Flow (perm)	0	1300	1583	0	1168	1583	63	3539	1583	598	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			123			72			123
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		442			249			405			907	
Travel Time (s)		12.1			6.8			6.1			13.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	49	0	41	6	151	887	11	19	2388	117
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4	2		2	6		6
Detector Phase	4	4	4	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	13.0	18.6	18.6	13.0	17.8	17.8
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	21.0	121.0	121.0	13.0	113.0	113.0
Total Split (%)	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	13.1%	75.6%	75.6%	8.1%	70.6%	70.6%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	4.5	5.6	5.6	3.9	4.8	4.8
All-Red Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	2.9	1.0	1.0	3.1	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6		6.6	6.6	7.4	6.6	6.6	7.0	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		15.5	15.5		15.5	15.5	130.5	123.6	123.6	116.7	112.1	112.1
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.82	0.77	0.77	0.73	0.70	0.70
v/c Ratio		0.71	0.19		0.37	0.02	0.81	0.32	0.01	0.04	0.96	0.10
Control Delay		98.6	1.5		75.4	0.2	73.6	6.8	0.0	3.0	28.3	0.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Total Delay		98.6	1.5		75.4	0.2	73.6	6.8	0.0	3.0	31.3	0.6
LOS		F	A		E	A	E	A	A	A	C	A
Approach Delay		64.1			65.8			16.3			29.7	
Approach LOS		E			E			B			C	
Queue Length 50th (ft)		91	0		41	0	104	156	0	2	1274	2
Queue Length 95th (ft)		155	0		82	0	#221	203	0	m3	#1497	m3
Internal Link Dist (ft)		362			169			325			827	
Turn Bay Length (ft)							200		225	200		225
Base Capacity (vph)		157	300		141	300	200	2733	1239	480	2479	1145
Starvation Cap Reductn		0	0		0	0	0	0	0	0	60	0

Wawa - Port Aquia Drive
 1: U.S. 1 & Port Aquia Drive/Church Driveway

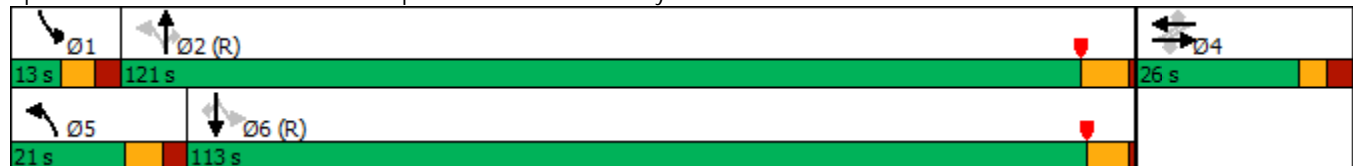
Build (2021) Conditions
 Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.57	0.16		0.29	0.02	0.76	0.32	0.01	0.04	0.99	0.10

Intersection Summary

Area Type: Other
 Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 13 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 27.7
 Intersection Capacity Utilization 96.9%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: U.S. 1 & Port Aquia Drive/Church Driveway



Wawa - Port Aquia Drive
2: U.S. 1 & RIRO Driveway

Build (2021) Conditions
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 8.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑↑	
Traffic Vol, veh/h	0	149	0	975	2239	65
Future Vol, veh/h	0	149	0	975	2239	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	162	0	1060	2434	71

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 1253	-	0 -
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	- 7.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	- 3.92	-	-
Pot Cap-1 Maneuver	0 ~ 140	0	-
Stage 1	0	0	-
Stage 2	0	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	- ~ 140	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	187	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 140	-	-
HCM Lane V/C Ratio	- 1.157	-	-
HCM Control Delay (s)	- 187	-	-
HCM Lane LOS	- F	-	-
HCM 95th %tile Q(veh)	- 9.3	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Wawa - Port Aquia Drive
 3: Full-Movement Driveway & Port Aquia Drive

Build (2021) Conditions
 Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	62	2	150	99	2	66
Future Vol, veh/h	62	2	150	99	2	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	2	163	108	2	72

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	69
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1532
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1532
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	473	995	-	-	1532	-
HCM Lane V/C Ratio	0.005	0.072	-	-	0.106	-
HCM Control Delay (s)	12.6	8.9	-	-	7.6	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.2	-	-	0.4	-

Intersection: 1: U.S. 1 & Port Aquia Drive/Church Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	60	60	104	25	118	108	119	10	107	381	382	109
Average Queue (ft)	18	26	37	4	41	31	29	1	11	110	123	8
95th Queue (ft)	50	52	83	20	90	82	85	5	54	284	299	82
Link Distance (ft)	353	353	191	191		333	333			822	822	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			225	200			225
Storage Blk Time (%)										2	2	
Queuing Penalty (veh)										0	1	

Intersection: 1: U.S. 1 & Port Aquia Drive/Church Driveway

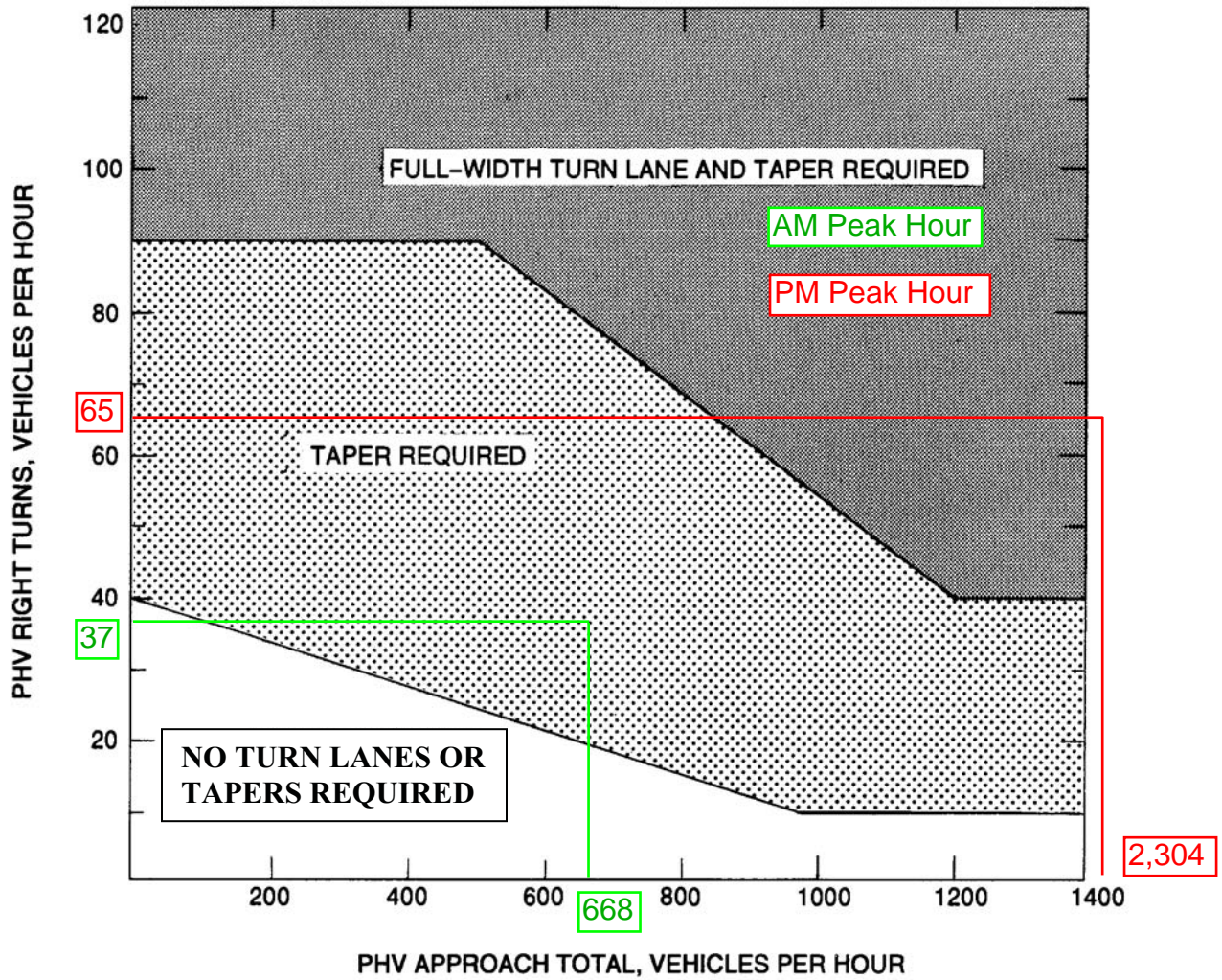
Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	337	58	60	40	275	346	340	96	31	186	200	26
Average Queue (ft)	180	26	17	8	71	183	188	4	5	72	66	6
95th Queue (ft)	301	53	48	29	177	343	352	56	22	149	156	21
Link Distance (ft)	364	364	191	191		334	334			822	822	
Upstream Blk Time (%)	0					0	0	0				
Queuing Penalty (veh)	0					5	5	0				
Storage Bay Dist (ft)					200			225	200			225
Storage Blk Time (%)					0	6	5			0	0	
Queuing Penalty (veh)					0	12	1			0	0	

Queuing and Blocking Report
Wawa - Port Aquia Drive

Build (2021) Conditions
PM Peak Hour

Intersection: 1: U.S. 1 & Port Aquia Drive/Church Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	170	92	94	28	210	217	187	11	134	698	697	324
Average Queue (ft)	76	36	34	5	102	52	48	1	16	315	329	56
95th Queue (ft)	142	77	76	21	188	146	126	5	90	639	657	237
Link Distance (ft)	369	369	191	191		335	335			822	822	
Upstream Blk Time (%)						0	0			0	0	
Queuing Penalty (veh)						0	0			1	1	
Storage Bay Dist (ft)					200			225	200			225
Storage Blk Time (%)					1	0	0			14	13	
Queuing Penalty (veh)					6	0	0			2	15	



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV- - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

If PHV is not known use formula: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

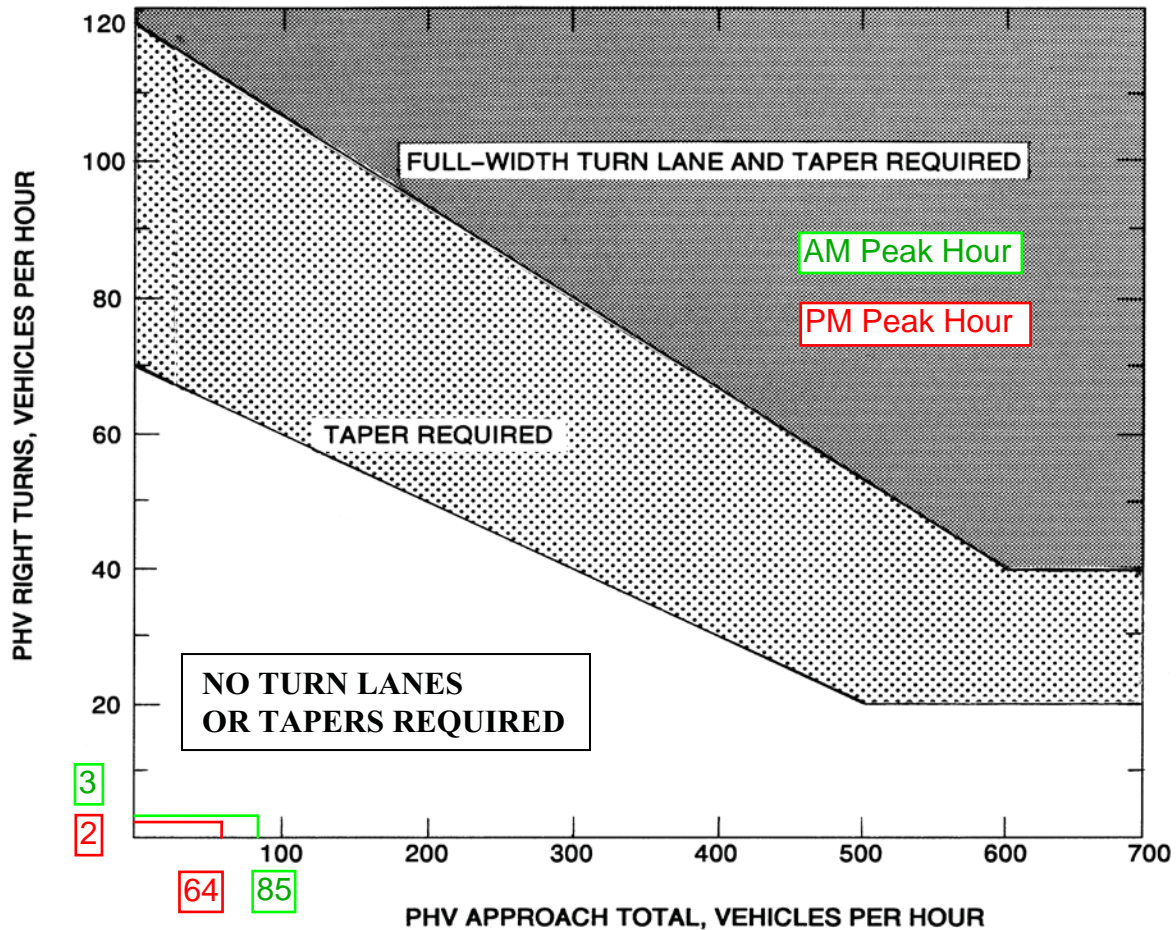
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-27 WARRANTS FOR RIGHT TURN TREATMENT (4-LANE HIGHWAY)

* Rev. 1/15



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.

Adjusted right turns = PHV Right Turns - 20

If PHV is not known use formula: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAY

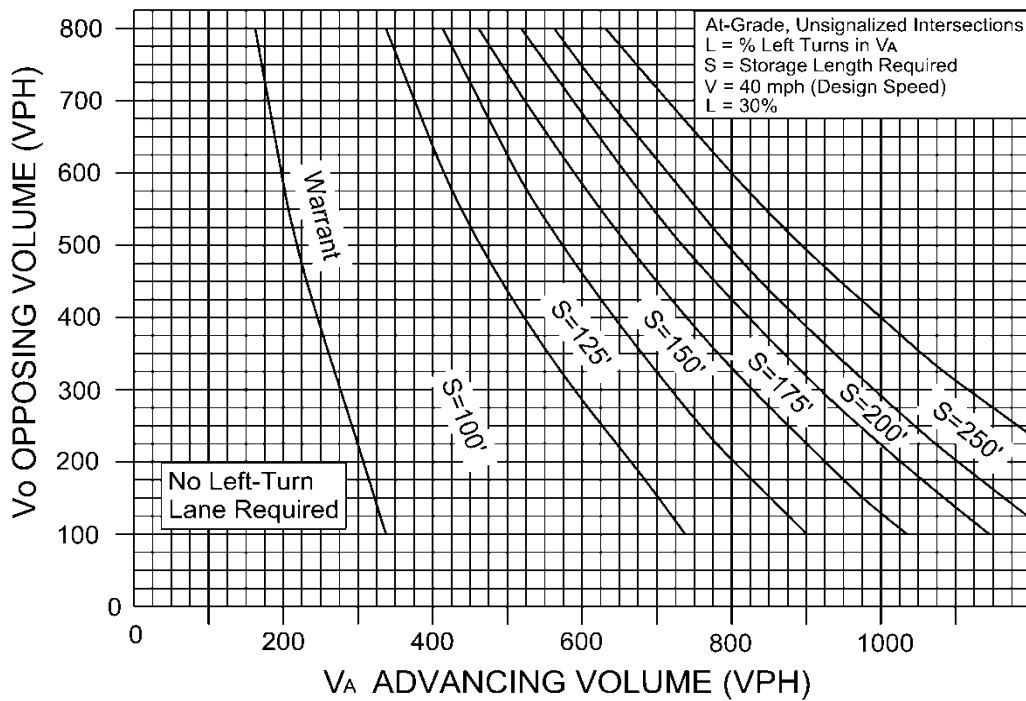


FIGURE 3-9

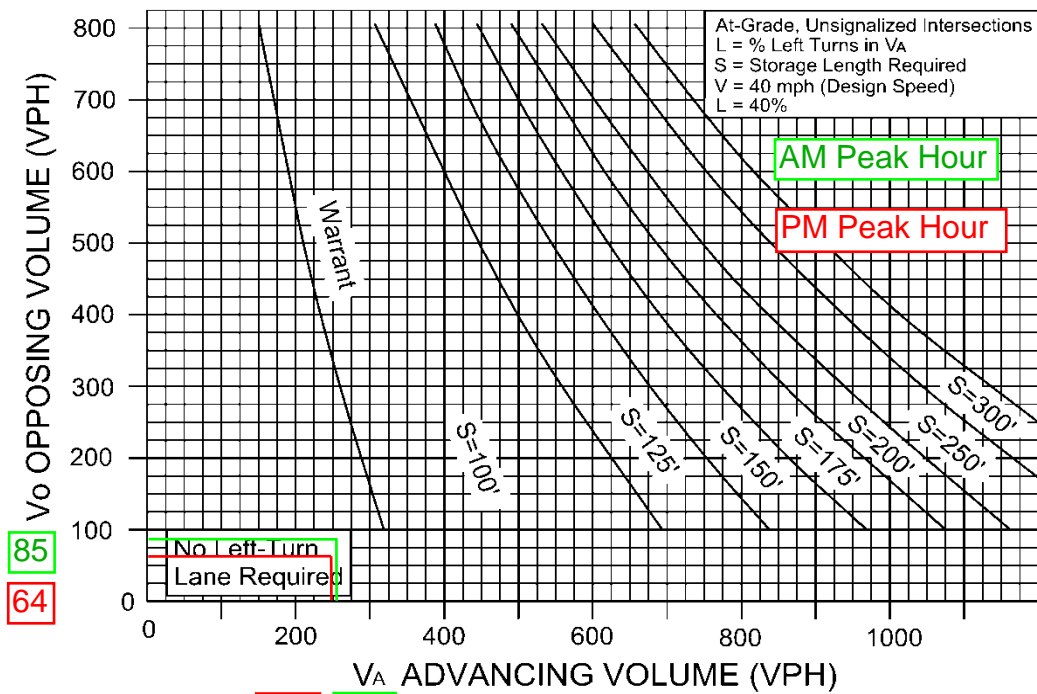


FIGURE 3-10