

ACCESS MANAGEMENT EXCEPTION REQUEST: AM-E
ACCESS MANAGEMENT REGULATIONS 24 VAC 30-73
SECTION 120

Submitted by:		Date:	
Email Address:		Phone:	
Address:			
Project Name:	Rte #	Locality:	
Description of Project:			
VDOT District:		Area Land Use Engineer:	

NOTES:

- (1). Submit this form and any attachments to one of the District's Area Land Use Engineers.
- (2). See Section 120 of the Regulations for details on the requirements, exceptions, and exception request review process.
- (3). Attach additional information as necessary to justify the exception request(s).
- (4). If a traffic engineering study is required, the decision on the request will be based on VDOT engineering judgment.
- (5). Use the LD-440 Design Exception or the LD-448 Design Waiver forms for *design and engineering standards*, e.g. radius, grade, sight distance. See [IIM-LD-227](#) on VDOT web site for additional instructions.

Select the Exception(s) Being Requested

☐ **Exception to the shared commercial entrance requirement.** (Access M. Regulations Section 120 C.2)

Reason for exception:

☐ **A. An agreement to share the entrance could not be reached with adjoining property owner.**

☐ **Attached:** Written evidence that adjoining property owner will not share the entrance.

☐ **B. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.**

☐ **Specify constraint:**

☐ **Attached:** Documentation of constraint such as aerial photo or topographic map.

☐ **Exception to the vehicular connection to adjoining undeveloped property requirement.** (Section 120 C.4)

Reason for exception:

☐ **A. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.**

☐ **Specify constraint:**

☐ **Attached:** Documentation of constraint such as aerial photo or topographic map.

☐ **B. Other reason:**

☐ **Exception to the commercial entrance shall not be located within the functional area of an intersection requirement.** (See Regulation Section 120 C. 1; Appendix F, Rd Design Manual)

☐ **Attached:** A traffic engineering study documenting that the operation of the intersection and public safety will not be adversely impacted.

☐ **EXCEPTION TO THE SPACING STANDARDS FOR:**

- **Commercial entrances; intersections/median crossovers (Table 2-2);**
- **Commercial entrances/intersections near interchange ramps (Tables 2-3, 2-4); or**
- **Corner clearance (Figure 4-4).** Appendix F, Road Design Manual

Information on the Exception Request

☐ **ON A STATE HIGHWAY**

Functional classification: Principal Arterial: ☐ Minor Arterial: ☐ Collector: ☐ Local: ☐

Posted speed limit: _____ mph

☐ **NEAR AN INTERCHANGE RAMP** (Submittal of a traffic engineering study required)

☐ **CORNER CLEARANCE** (Submittal of a traffic engineering study required)

Type of intersection/entrance: Signalized ☐ Unsignalized ☐ Full Access ☐ Partial Access ☐

Required spacing distance _____ ft

Proposed spacing distance _____ ft

Requested exception: Reduction in required spacing _____ ft

REASON FOR EXCEPTION:

☐ **A. To be located on an older, established business corridor along a highway where existing spacing did not meet the standards prior to 7/1/08 or 10/14/09.** (Regulation Section 120 C.3.c)

☐ **Attached:** Dated aerial photo of corridor identifying proposed entrance/intersection location.

☐ **B. Not enough property frontage to meet spacing standard, but the applicant does not want a partial access right-in/right-out entrance.** (Section 120 C.3.f)

☐ **Attached:** A traffic engineering study documenting that left turn movements at the entrance will not have a negative impact on highway operation or safety.

☐ **C. To be located within a new urbanism mixed use type development.** (Section 120 C.3.d)

☐ **Attached:** The design of the development and compliance with intersection sight distance.

☐ **D. The proposed entrance meets the signal warrants but does not meet the signalized intersection spacing standard. The applicant requests an exception to the spacing standard.**

☐ **Attached:** A traffic engineering study that (i) evaluates the location's suitability for a roundabout and (ii) provides documentation that the proposed signal will not impact safety and traffic flow. (Section 120 C.5)

- ☐ E. The development's 2nd (or additional) entrance does not meet the spacing standards but is necessary for the streets to be accepted into the secondary system. (Section 120 C.3.e)

☐ Attached: Information on the development that identifies the location of entrances.

- ☐ F. To be located within the limits of a VDOT and locality approved access management corridor plan.

☐ Attached: Aerial photo of corridor identifying proposed entrance/intersection location. (Sect 120 C.3.b)

FOR VDOT USE ONLY

Recommendation on Exception Request: Approve <input type="checkbox"/> Deny <input type="checkbox"/>		Date:
Area Land Use Engineer or:		Name
Remarks:		

Exception Request Action: Approved <input type="checkbox"/> Denied <input type="checkbox"/>		Date:
District Administrator or Designee:		
Name (and position if Designee)		
Remarks:		

District Staff: Please email copy to Bradley.Shelton@VDOT.Virginia.gov

April 6, 2018

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

Reference: Enon Road C-Store – Traffic Impact Analysis (TIA)
Stafford County, Virginia

Dear Mr. Zuraf,

Ramey Kemp & Associates, Inc. (RKA) has performed a TIA to support the proposed convenience store in the southwest quadrant of the intersection of U.S. 1 at Enon Road / Cranes Corner Road. The conceptual site plan includes a convenience store with 12 fueling positions. The access plan includes one full-movement driveway on Enon Road approximately 600 feet west of U.S. 1, and one right-in / right-out driveway on U.S. 1 approximately 425 feet south of Enon Road / Cranes Corner Road. If approved, the store is expected to be built-out by 2020. Figure 1 shows the site location and study intersections.

Based on the scoping meeting with the County and the Virginia Department of Transportation (VDOT) on March 12, the purpose of this letter report is to provide the following:

- Trip generation calculations
- Evaluation of turn lane warrants for both driveways
- Capacity analysis of study intersections
- Access Management Exception (AME) request

Existing Roadway Conditions

U.S. 1 is a four-lane divided Principal Arterial with an average daily traffic (ADT) volume of approximately 24,000 vehicles per day south of Enon Road. North of ENON Road, U.S. 1 is a six-lane divided roadway with an ADT volume of approximately 18,000 vehicles per day, and a posted speed limit of 45 mph in the vicinity of the site.

Centreport Parkway is a two-lane major collector with an ADT volume of approximately 6,500 vehicles per day, and a posted speed limit of 45 mph.

Enon Road is a two-lane major collector with an ADT volume of approximately 5,900 vehicles per day, and a posted speed limit of 40 mph.

Cranes Corner Road is a two-lane local collector with an ADT volume of approximately 330 vehicles per day, and a posted speed limit of 30 mph.

Existing Traffic Volumes

The AM peak hour (6:30 to 9:00 AM) and PM peak hour (2:00 to 6:00 PM) turning movement counts were conducted by Technical Traffic Services at the following intersections during the weeks of January 9 and January 30, 2017:

- U.S. 1 at Enon Road / Cranes Corner Road
- U.S. 1 at Centreport Parkway

The 2017 count volumes were grown by 2% for one year to estimate the existing 2018 volumes which are shown in Figure 2. Note that the volumes have been increased as necessary to balance between intersections. For the analysis, the peak hour factor (PHF) was calculated by approach, which is a requirement of VDOT's *Traffic Operations and Safety Analysis Manual* (TOSAM). The traffic count data is included in the appendix.

Background Traffic Growth

Based on discussion with VDOT, the existing 2018 volumes were grown by an annual rate of 2% for two years to estimate the 2020 no-build volumes.

Approved Development Traffic

We understand there are two approved developments near the site that are included in this TIA. Potomac Creek Crossing is a 38,421 square foot (s.f.) office building located on the west side of U.S. 1 approximately 3,000 feet north of Enon Road. The trip generation potential of Potomac Creek Commercial during a typical weekday, AM peak hour and PM peak hour was estimated using the methodologies published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual – 10th Edition*.

Table 1
ITE Trip Generation – 10th Edition – Weekday – Potomac Creek Commercial

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
General Office (710)	38,500 s.f.	210	210	54	9	7	39

Figures 4 and 5 show the trip distribution and assignment for Potomac Creek Commercial.

Cranes Corner Residential consists of 21 single family homes located at the end of Cranes Corner Road. The ITE trip generation potential of Cranes Corner Residential is shown in Table 2.

Table 2
ITE Trip Generation – 10th Edition – Weekday – Cranes Corner Residential

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
Single Family Detached Housing (210)	21 homes	124	124	5	15	14	9

Figures 6 and 7 show the trip distribution and assignment for Cranes Corner Residential. The total approved development trips are shown in Figure 8. The total approved development trips were combined with the background growth to estimate the 2020 no-build traffic volumes, which are shown in Figure 9.

Trip Generation

Based on discussion with VDOT, the trip generation potential of the proposed C-store was estimated by using the multi-variable regression formula published by ITE. Table 3 shows the ITE trip generation potential of the proposed 7,000 s.f. convenience store with 12 fueling positions.

Table 3
ITE Trip Generation – 10th Edition – Weekday

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)	12 f.p.	1,383	1,383	264*	264*	207*	207*
ITE Pass-by Trips: 63% AM / 66% PM		-892	-892	-166	-166	-137	-137
New Primary Trips		491	491	98	98	70	70

* Value was calculated using the multi-variable regression formula published by ITE.

Convenience stores attract pass-by trips, which are made by drivers who are already driving by the site today and will visit the C-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:

- 40% to / from the south on U.S. 1
- 20% to / from the north on U.S. 1
- 20% to / from the west on Centreport Parkway
- 20% to / from the west on Enon Road

Based on the historical ADT's, it was assumed that 80% of the total pass-by trips will originate from U.S. 1, and 20% of the total pass-by trips will originate from Enon Road.

The following directional distributions were applied to U.S. 1:

- AM Peak – 75% northbound / 25% southbound
- PM Peak – 30% northbound / 70% southbound

The following directional distributions were applied to Enon Road:

- AM Peak – 50% westbound / 50% eastbound
- PM Peak – 50% westbound / 50% eastbound

Figures 10 and 11 show the primary and pass-by site traffic distributions, respectively. Figure 12 shows the primary site trip assignment, and Figure 13 shows the pass-by site trip assignment. Figure 14 shows the total site trips, and Figure 15 shows the build 2020 peak hour traffic volumes.

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*:

Enon Road at Full-Movement Driveway:

- A westbound left-turn lane on Enon Road is warranted
- An eastbound right-turn taper on Enon Road is warranted

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

- A southbound right-turn lane on U.S. 1 is warranted

The turn lane warrant diagrams are enclosed for reference, and Figure 16 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 425 feet south of Enon Road, which exceeds VDOT minimum spacing standards.

VDOT requires at least 335 feet of separation between full-movement access driveways and other intersections on Collector roads posted 40 mph. The proposed full-movement driveway on Enon Road is approximately 600 feet west of U.S. 1, which exceeds VDOT minimum spacing standards, but is located within the functional area of the U.S. 1 at Enon Road / Cranes Corner Road intersection. An AME request form is attached.

Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 9.1, 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 2010 Highway Capacity Manual (HCM). Note that the reported queues for movements with LOS F were determined using SimTraffic. The SimTraffic maximum queues shown are the average of ten simulation runs.

Table 4 summarizes the capacity analysis results for the signalized intersection of U.S. 1 at Centreport Parkway, and all of the Synchro outputs are enclosed for reference.

Table 4
Level-of-Service Summary for U.S. 1 at Centreport Parkway

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Queue (ft)	Overall LOS (Delay)	Lane LOS	Queue (ft)	Overall LOS (Delay)
Existing 2018 Traffic Conditions	WBL	D	292	B (14.4 sec)	E	735	C (28.2 sec)
	WBR	B	142		B	56	
	NBT	B	209		C	157	
	NBR	A	31		A	199	
	SBL	A	37		C	131	
	SBT	A	50		C	415	
No-Build 2020 Traffic Conditions	WBL	D	304	B (15.7 sec)	D	866	C (29.3 sec)
	WBR	C	196		B	64	
	NBT	B	227		C	156	
	NBR	A	44		A	196	
	SBL	A	42		C	148	
	SBT	A	54		C	418	
Build 2020 Traffic Conditions	WBL	E	324	B (17.8 sec)	D	909	C (30.7 sec)
	WBR	C	197		B	65	
	NBT	B	236		C	171	
	NBR	A	57		B	229	
	SBL	A	43		C	146	
	SBT	A	58		C	420	

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

Under build conditions, the intersection is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour with all movements operating at LOS D or better. No improvements are warranted or recommended at this intersection.

Table 5 summarizes the capacity analysis results for the signalized intersection of U.S. 1 at Enon Road / Cranes Corner Road. All of the Synchro and SimTraffic outputs are enclosed for reference.

Table 5
Level-of-Service Summary for U.S. 1 at Enon Road / Cranes Corner Road

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Queue (ft)	Overall LOS (Delay)	Lane LOS	Queue (ft)	Overall LOS (Delay)
Existing 2018 Traffic Conditions	EBL/T	E	497	D (42.5 sec)	E	399	C (27.9 sec)
	EBR	A	60		B	84	
	WBL/T/R	E	39		E	16	
	NBL	E	677		F	252	
	NBT/R	B	318		A	106	
	SBL	E	10		F	19	
	SBT	E	232		C	901	
	SBR	E	218		A	22	
No-Build 2020 Traffic Conditions	EBL/T	F	479	D (46.9 sec)	F	331	C (30.1 sec)
	EBR	A	66		B	87	
	WBL/T/R	E	57		E	23	
	NBL	E	721		F	297	
	NBT/R	B	352		A	114	
	SBL	E	15		F	87	
	SBT	E	255		C	943	
	SBR	F	264		A	34	
Build 2020 Traffic Conditions (With Improvements)	EBL	E	324	D (45.7 sec)	E	192	C (31.5 sec)
	EBT/R	A	62		C	139	
	WBL/T/R	E	57		E	24	
	NBL	E	882		F	378	
	NBT/R	B	275		A	108	
	SBL	E	15		F	69	
	SBT	E	317		C	964	
	SBR	C	176		A	0	

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

Under build conditions, the intersection is expected to operate at LOS D during the AM peak hour and LOS C during the PM peak hour with the following improvement:

- Construct one eastbound left-turn lane on Enon Road with 325 feet of storage
- Modify the existing signal to provide a right-turn overlap for the southbound right-turn movement on U.S. 1
- Restripe the eastbound approach to provide dual left-turn lanes and one shared through-right turn lane
- Restripe the existing northbound left-turn lane to extend the existing storage as far as possible

Table 6 summarizes the capacity analysis results for the proposed unsignalized intersection of U.S. 1 at Right-in / Right-out Driveway, and all of the Synchro outputs are enclosed for reference.

Table 6
Level-of-Service Summary for U.S. 1 at Right-in / Right-out Driveway

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Queue (ft)	Overall LOS (Delay)	Lane LOS	Queue (ft)	Overall LOS (Delay)
Build 2020 Traffic Conditions	EBR ¹	B	13	N/A ²	D	50	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 that the eastbound right-turn movement out of the site is projected to operate with short delays (less than 25 seconds) during the AM peak hour, and with moderate delays (between 25 and 50 seconds) during the PM peak hour at build-out, and the queue lengths are expected to be two vehicles or less.

Table 7 summarizes the capacity analysis results for the proposed unsignalized intersection of Enon Road at Full-movement Driveway. All of the Synchro and SimTraffic outputs are enclosed for reference.

Table 7
Level-of-Service Summary for Enon Road at Full-movement Driveway

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Queue (ft)	Overall LOS (Delay)	Lane LOS	Queue (ft)	Overall LOS (Delay)
Build 2020 Traffic Conditions	EBT	-	-	N/A ³	-	-	N/A ³
	EBR	-	-		-	-	
	WBL ²	B	23		A	5	
	WBT	-	-		-	-	
	NBL ¹	F	89		D	18	
	NBR ¹	C	48		B	13	

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 out of the site is projected to operate with long delays (greater than 50 seconds) during the AM peak hour, and with moderate delays (between 25 and 50 seconds) during the PM peak hour at build-out, and the queue lengths are expected to be four vehicles or less. Long delays are common for minor street left-turn movements at intersections with major thoroughfares, and this intersection is not expected to meet signal warrants.

Recommendations

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

U.S. 1 at Enon Road / Cranes Corner Road

- Construct one eastbound left-turn lane on Enon Road with 325 feet of storage
- Modify the existing signal to provide a right-turn overlap for the southbound right-turn movement on U.S. 1
- Restripe the eastbound approach to provide dual left-turn lanes and one shared through-right turn lane
- Restripe the existing northbound left-turn lane to extend the existing storage as far as possible

Enon Road at Full-Movement Driveway

- Construct one westbound left-turn lane on Enon Road with 50 feet of storage
- Construct site driveway with one ingress lane and two egress lanes

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

- Restripe the existing pavement to create one southbound right-turn lane on U.S. 1 with 200 feet of storage
- Construct site driveway with one ingress lane and one egress lane

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.



Michael D. Bailey, P.E., PTOE
Project Manager

Enclosures: AME request, Figures, Traffic count data, Synchro output, VDOT turn lane warrant diagrams

Copy to: Mr. David Beale, P.E., VDOT
Mr. Peter Hedrich, P.E., PTOE, VDOT
Ms. Margaret Niemann, VDOT
Mr. Joey Hess, Stafford County
Mr. Thomas Wack, Wack General Contractor
Mr. Justin Franklin, P.E., Fairbanks & Franklin
Ms. Debrarae Karnes, Leming & Healy, PC



Inset



Overview

LEGEND



Study Intersection



Site Boundary

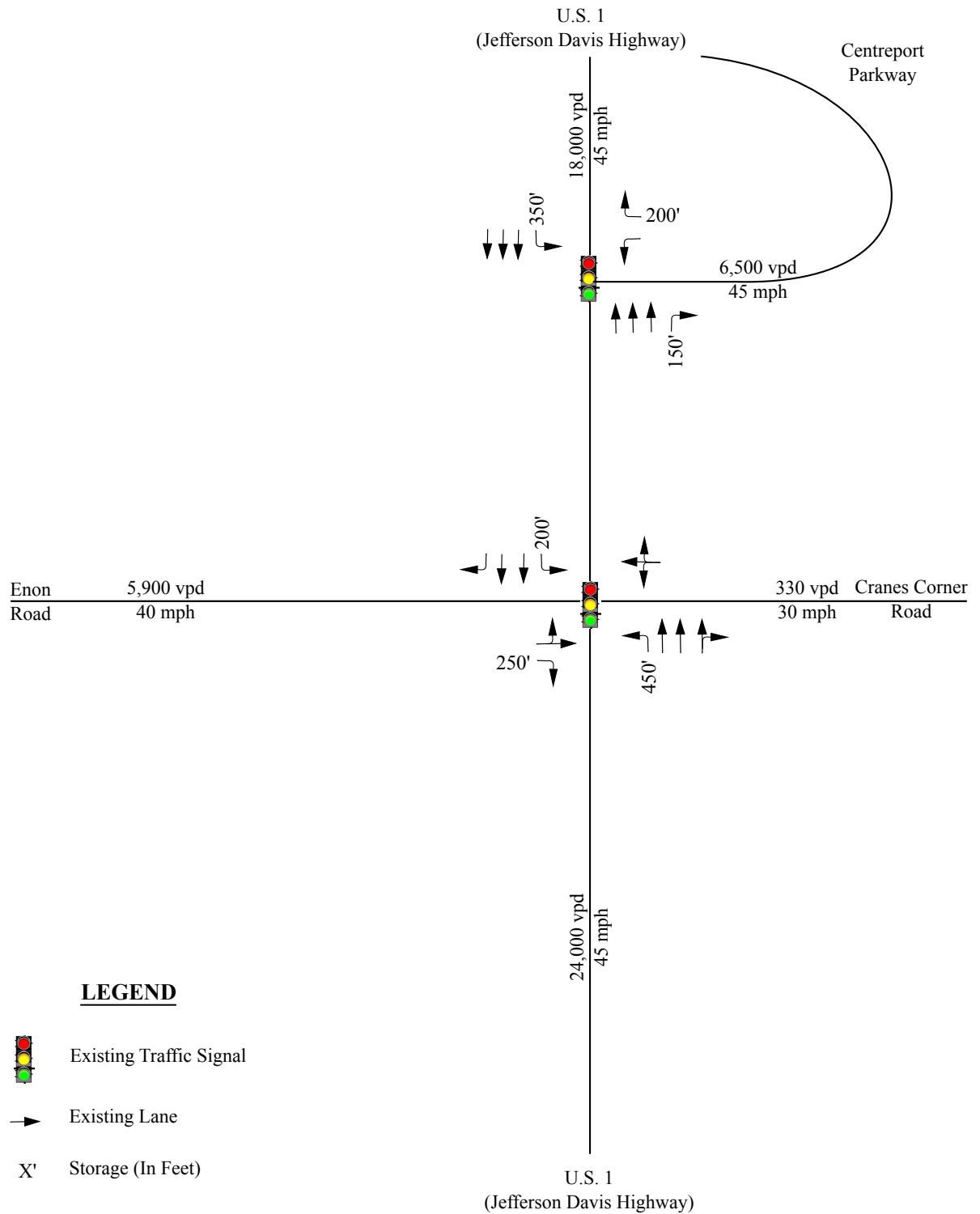


Enon Road C-Store
Stafford County, Virginia

Site Location and Study
Intersections

Scale: Not to Scale

Figure 1

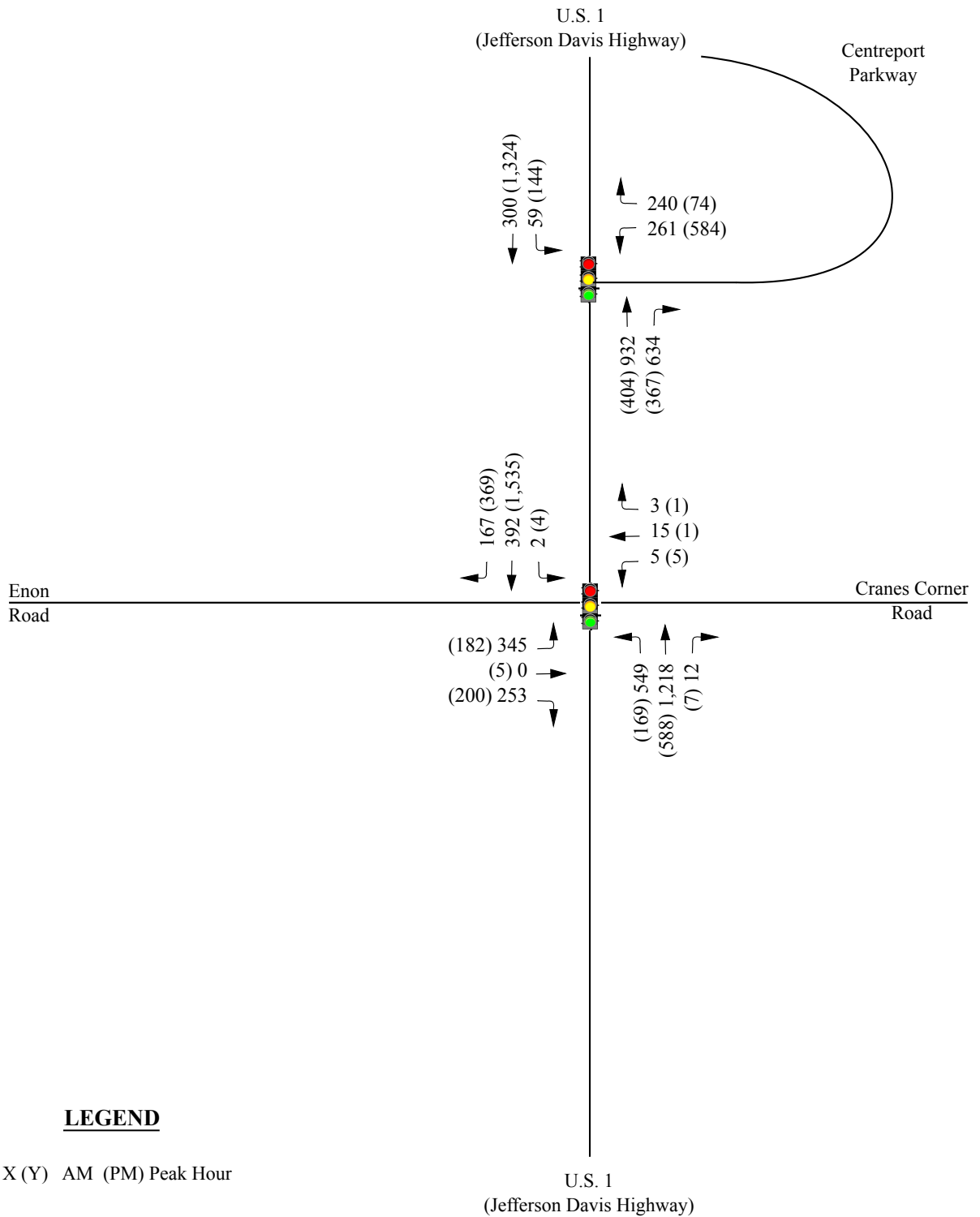


Enon Road C-Store
Stafford County, Virginia

Existing Lane Configuration

Scale: Not to Scale

Figure 2



Enon Road C-Store
Stafford County, Virginia

Existing (2018) Peak Hour
Traffic Volumes

Scale: Not to Scale

Figure 3



Enon
Road

Potomac Creek Commercial
(Jefferson Davis Highway)

U.S. 1
20%

60%

Centreport
Parkway

(20%)
(60%)

60%

20%

(20%)

Cranes Corner
Road

20%

20%

U.S. 1
(Jefferson Davis Highway)

LEGEND

XX% Regional Trip Distribution

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



Enon Road C-Store
Stafford County, Virginia

Potomac Creek Commerical
Distribution

Scale: Not to Scale

Figure 4



Enon
Road

Potomac Creek Commercial
(Jefferson Davis Highway)

U.S. 1

Centreport
Parkway

2 (8)
5 (23)

32 (4)

(1) 11

2 (8)

(1) 11

Cranes Corner
Road

LEGEND

X (Y) AM (PM) Peak Hour

U.S. 1
(Jefferson Davis Highway)

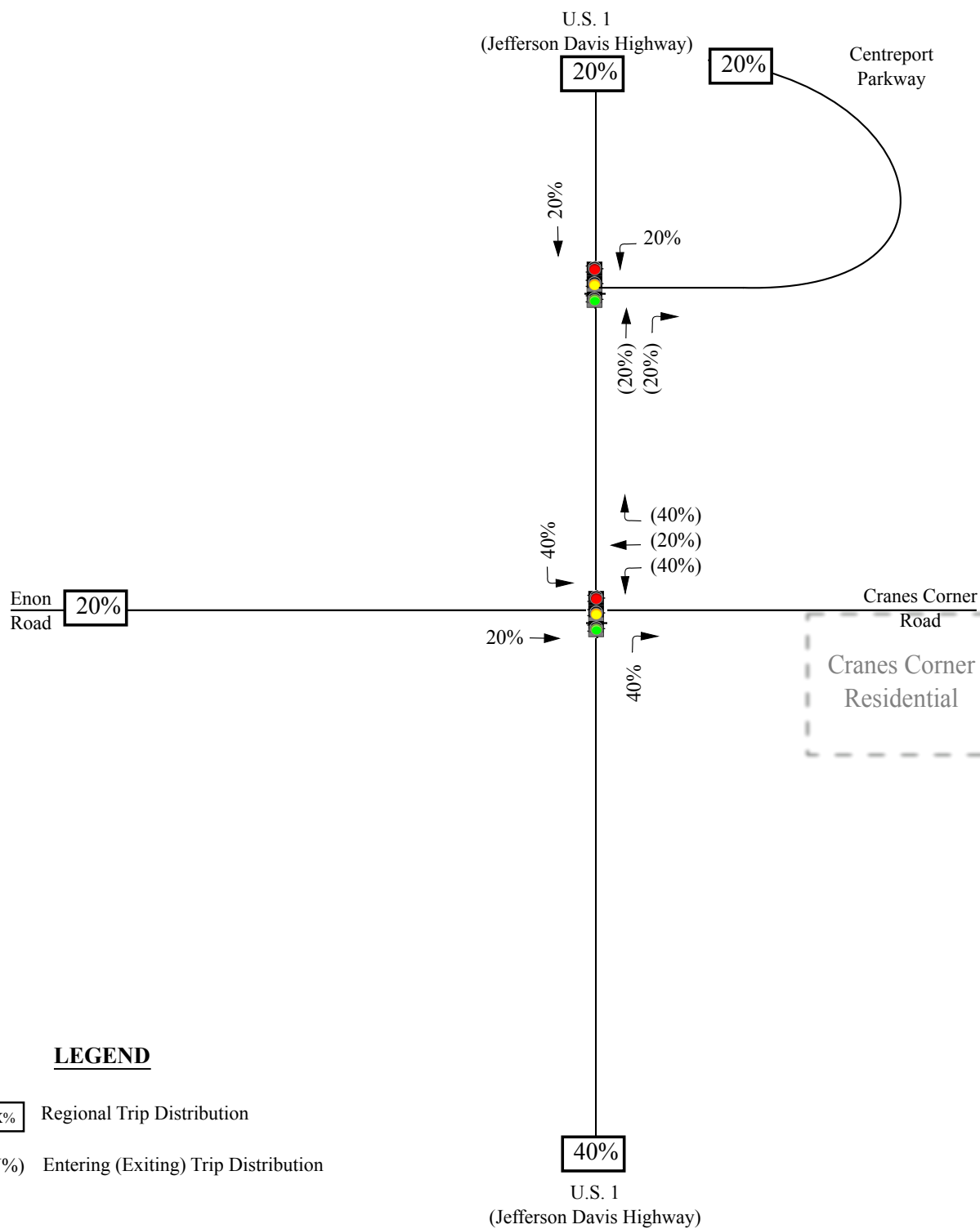


Enon Road C-Store
Stafford County, Virginia

Potomac Creek Commerical
Assignment

Scale: Not to Scale

Figure 5



LEGEND

XX% Regional Trip Distribution

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

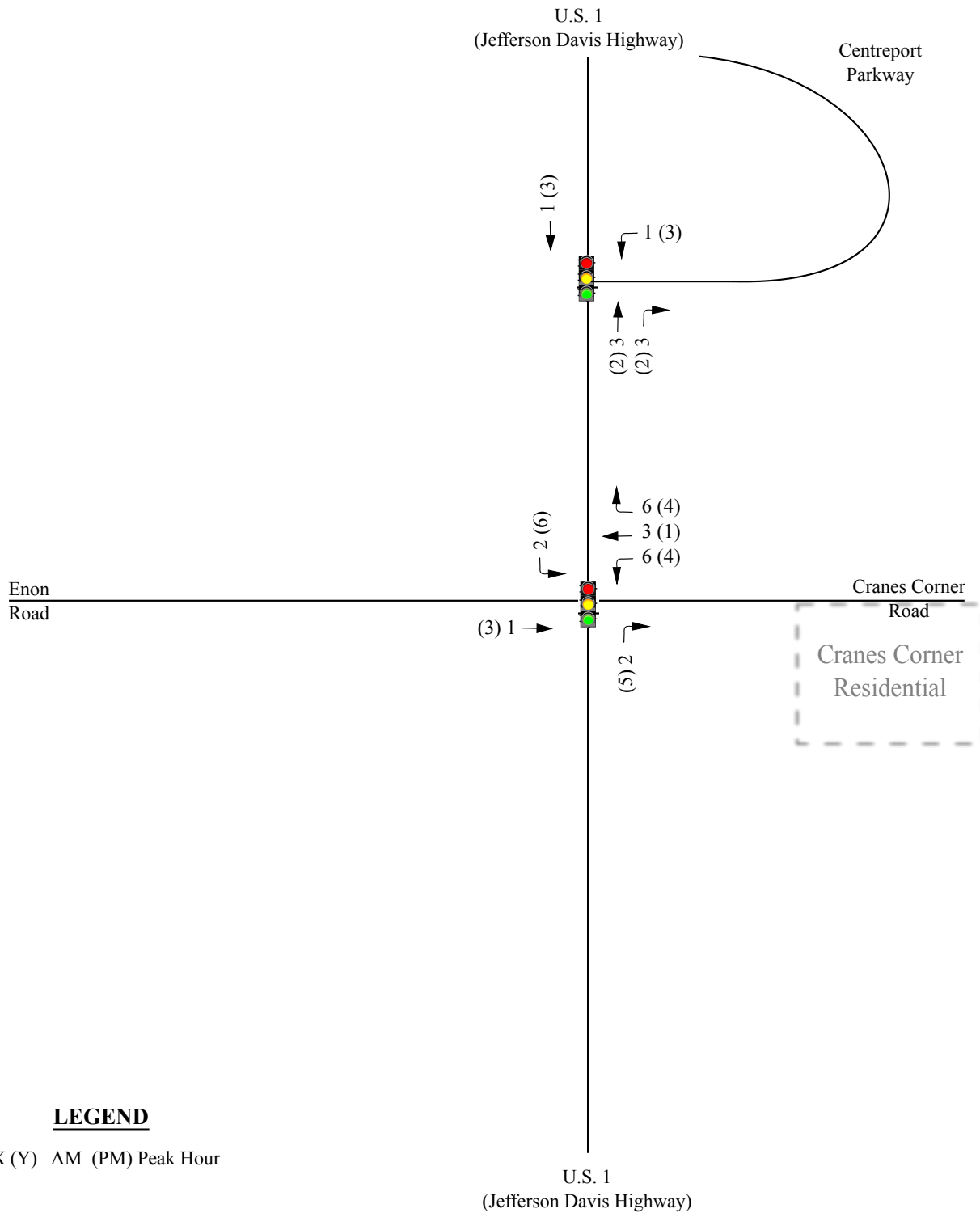


Enon Road C-Store
Stafford County, Virginia

Cranes Corner Residential
Distribution

Scale: Not to Scale

Figure 6



LEGEND

X (Y) AM (PM) Peak Hour



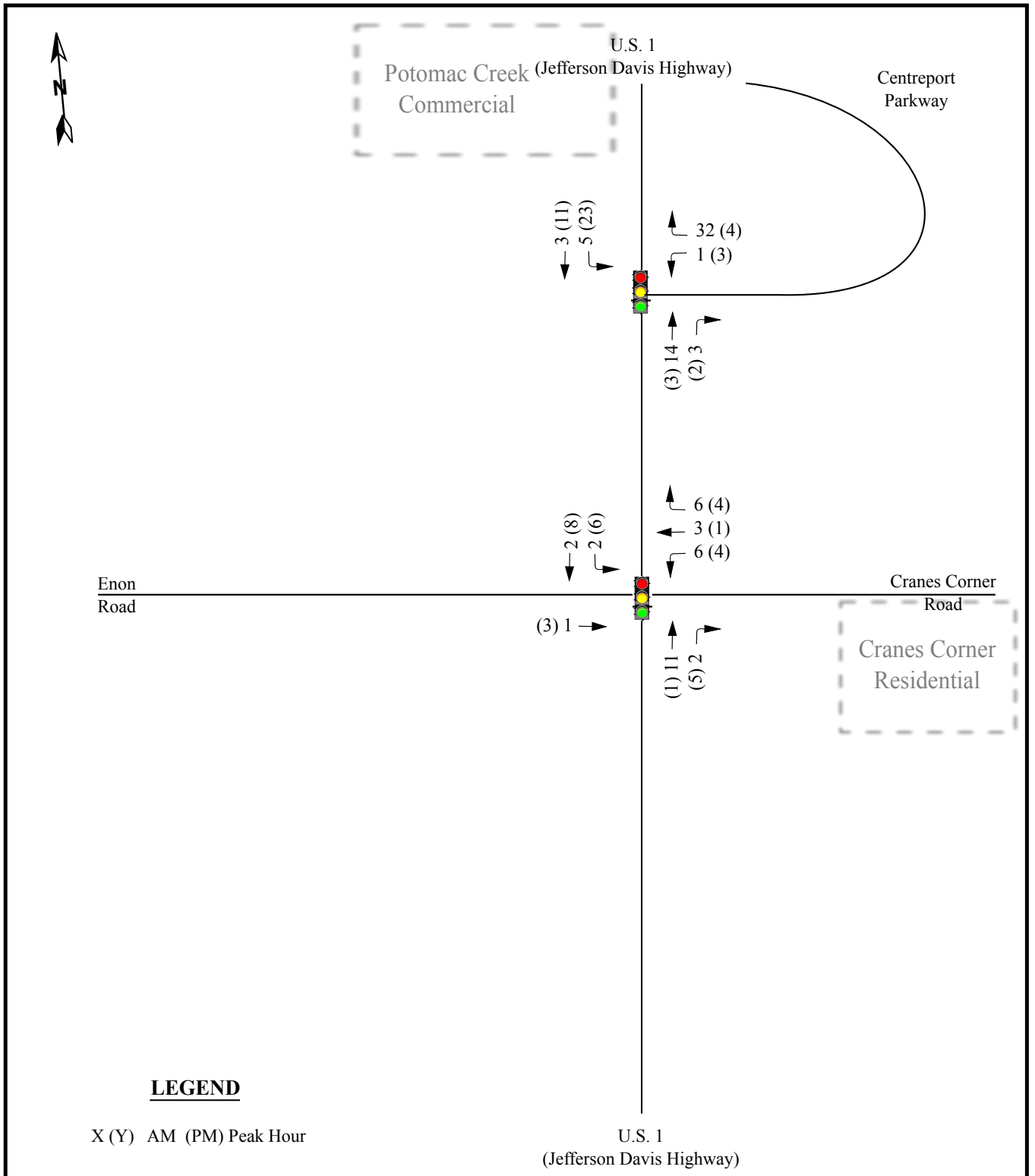
**RAMEY KEMP
&
ASSOCIATES**
TRANSPORTATION ENGINEERS

Enon Road C-Store
Stafford County, Virginia

Cranes Corner Residential
Assignment

Scale: Not to Scale

Figure 7



LEGEND

X (Y) AM (PM) Peak Hour

U.S. 1
(Jefferson Davis Highway)

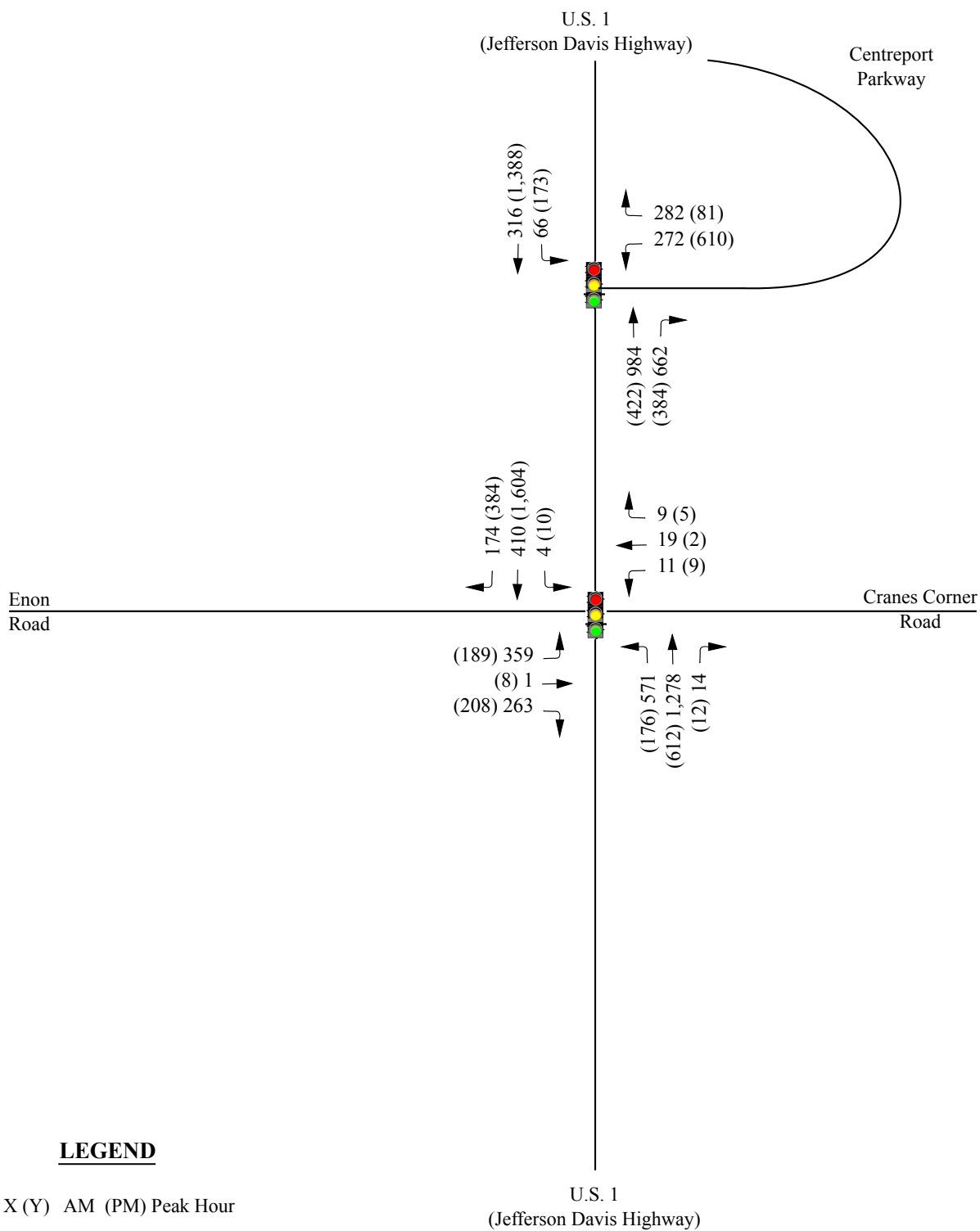


Enon Road C-Store
Stafford County, Virginia

Total Approved Development
Volumes

Scale: Not to Scale

Figure 8

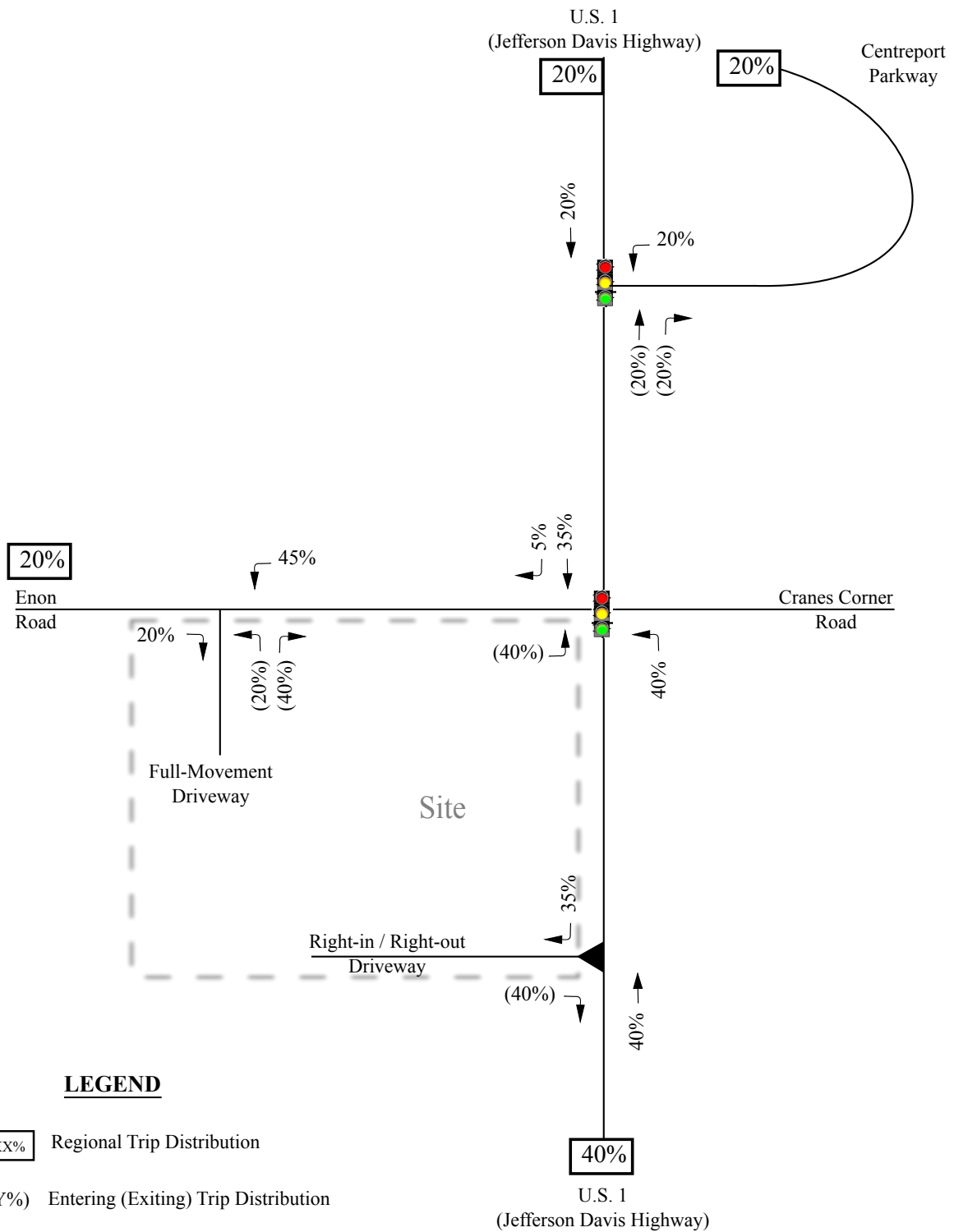


Enon Road C-Store
Stafford County, Virginia

No-Build (2020) Peak Hour
Traffic Volumes

Scale: Not to Scale

Figure 9

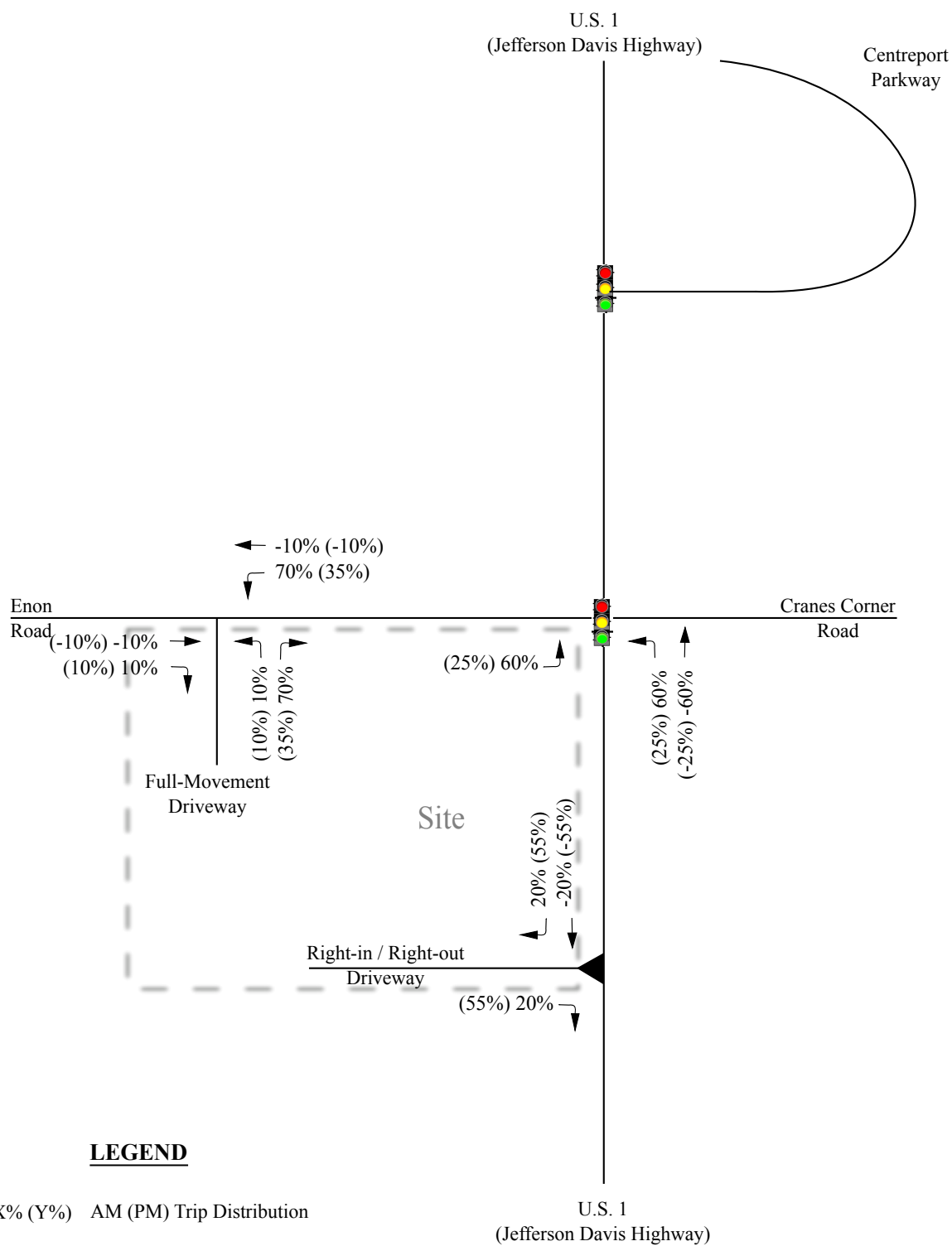


Enon Road C-Store
Stafford County, Virginia

Primary Site Trip
Distribution

Scale: Not to Scale

Figure 10

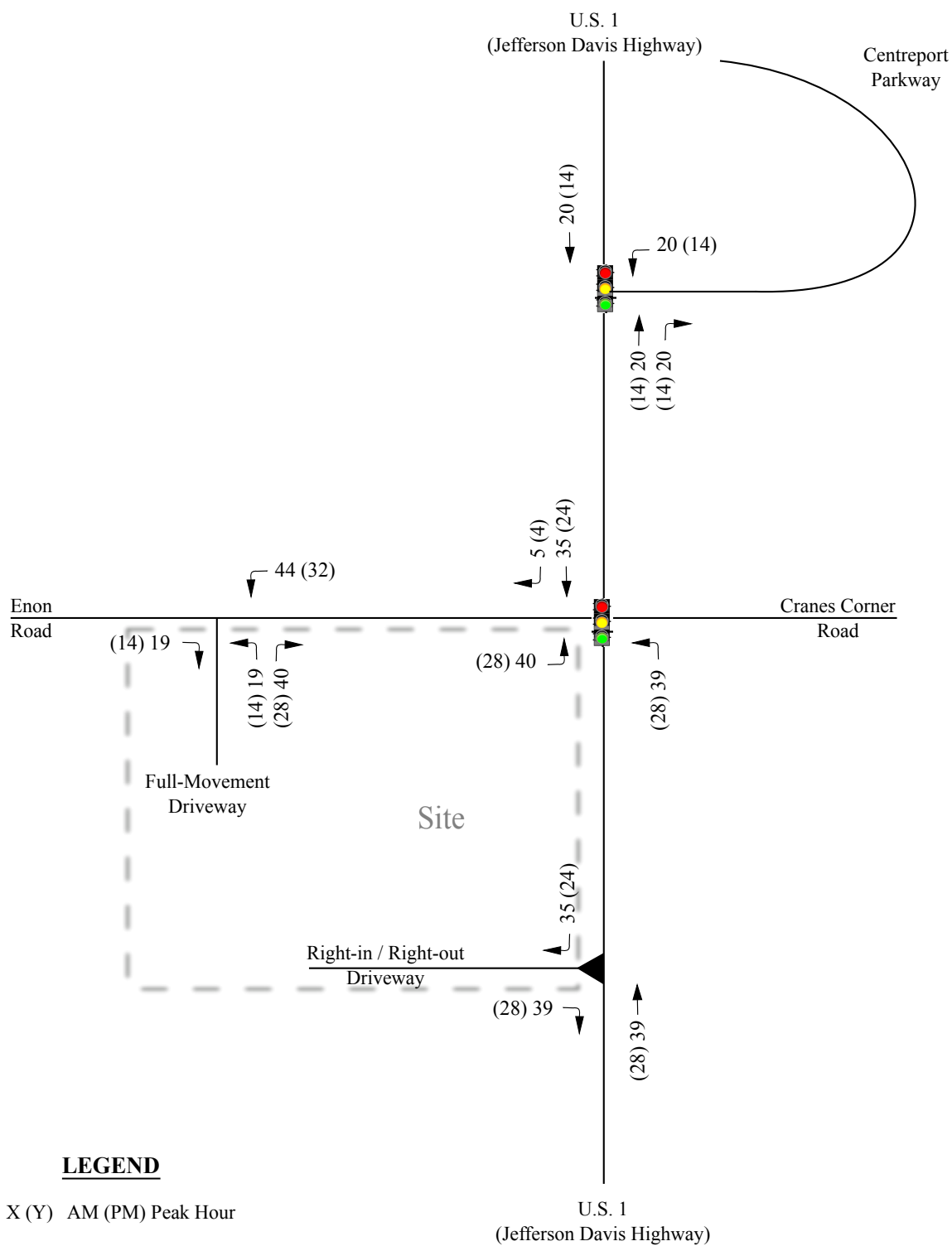


Enon Road C-Store
Stafford County, Virginia

Pass-By Site Trip
Distribution

Scale: Not to Scale

Figure 11

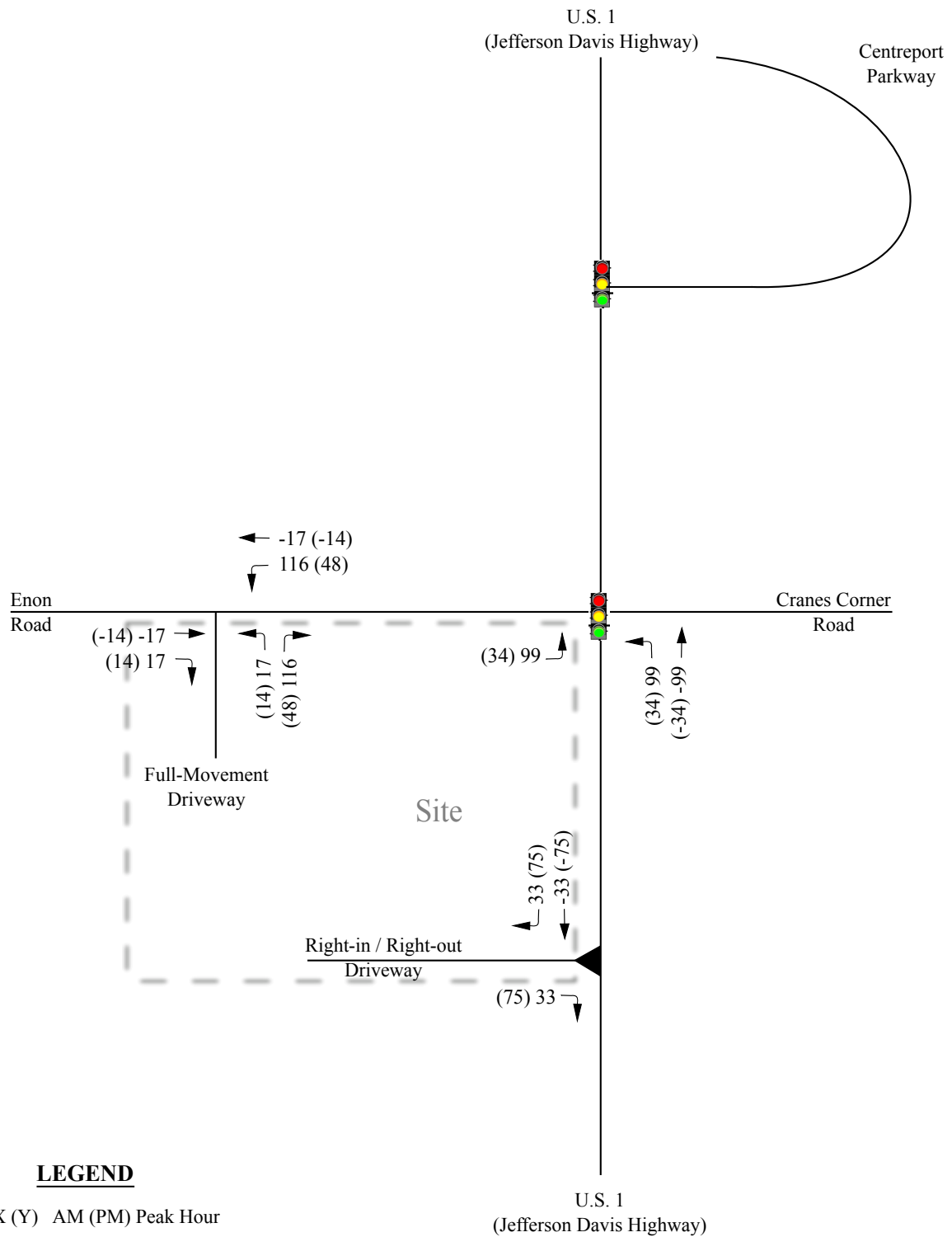


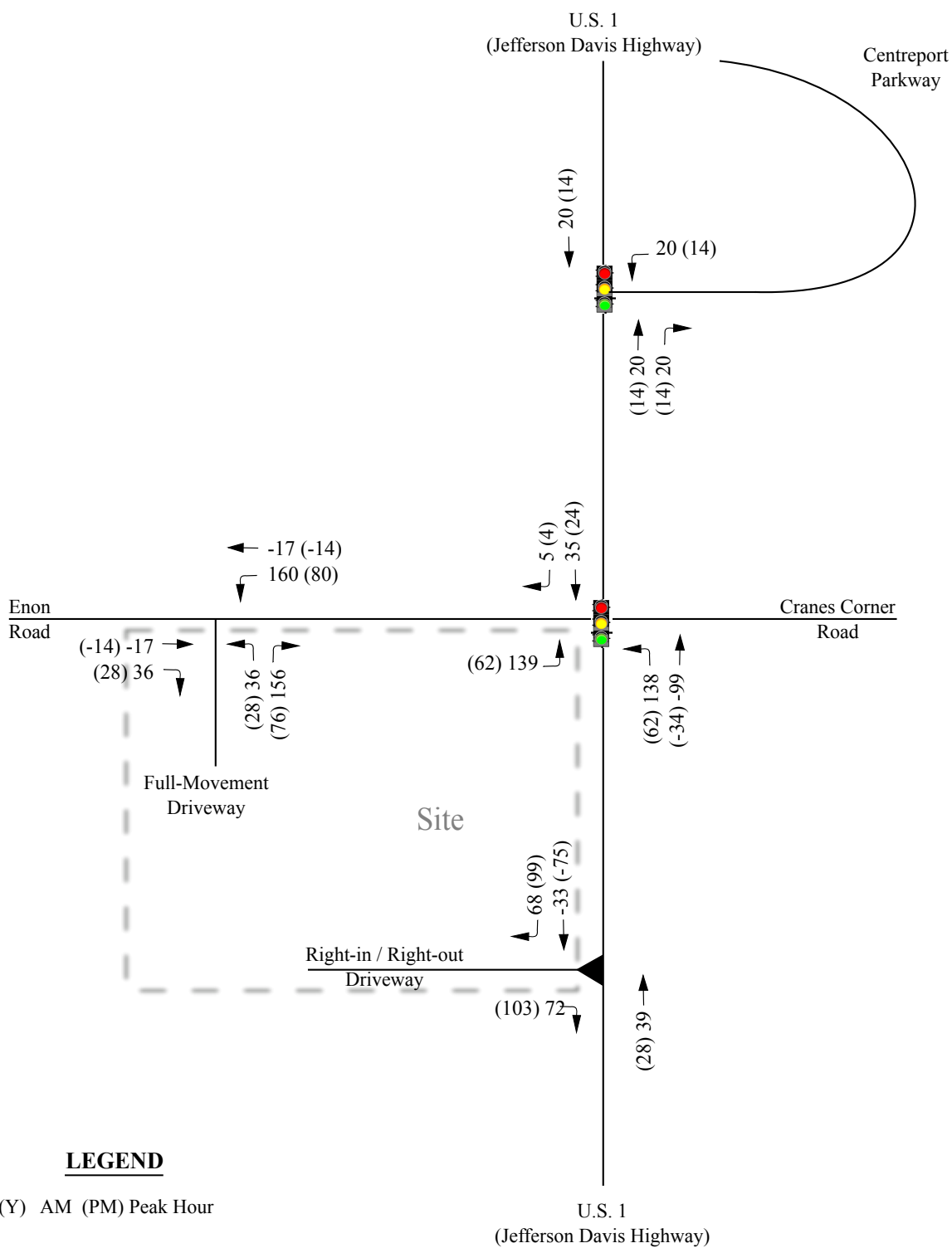
Enon Road C-Store
Stafford County, Virginia

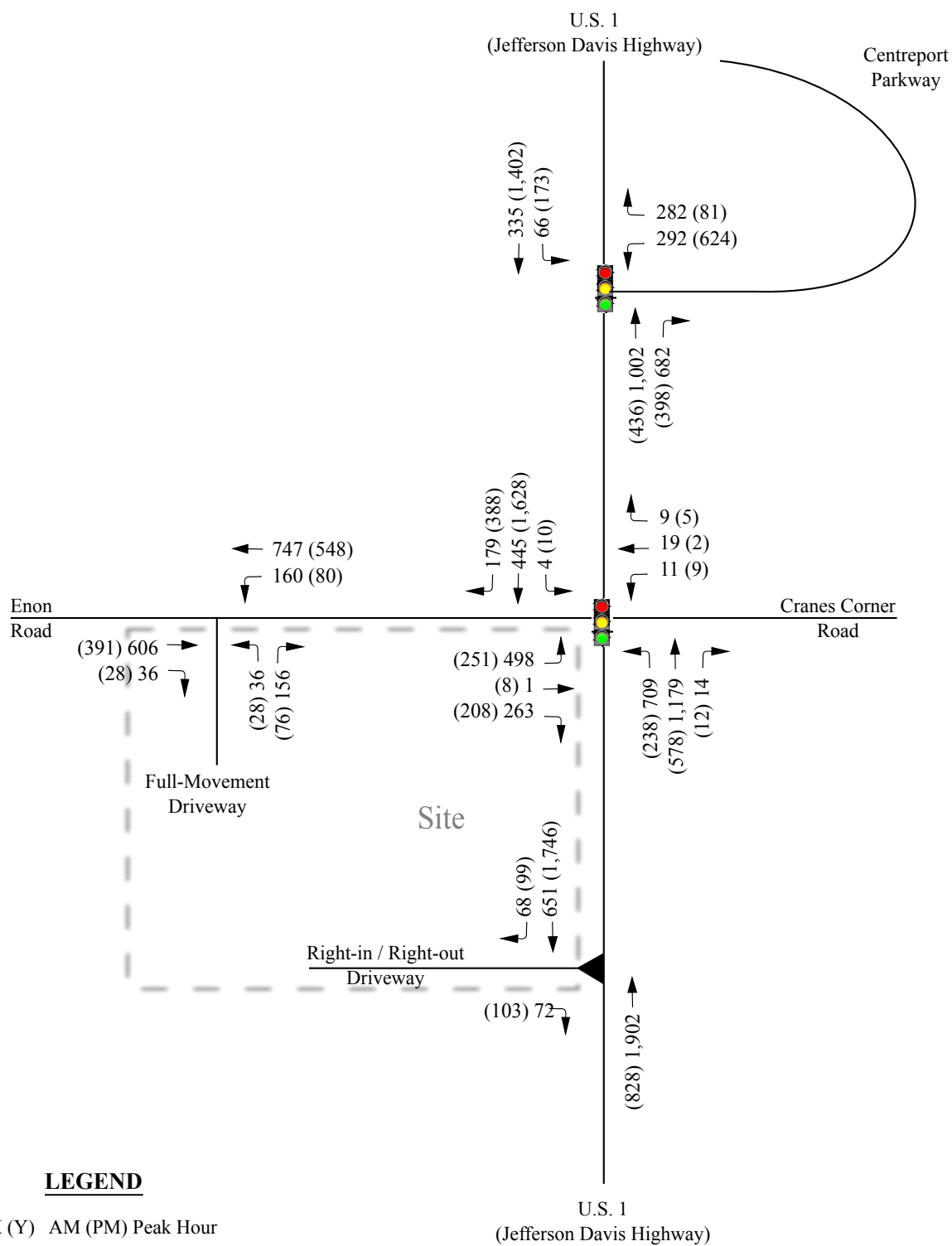
Primary Site Trip
Assignment

Scale: Not to Scale

Figure 12





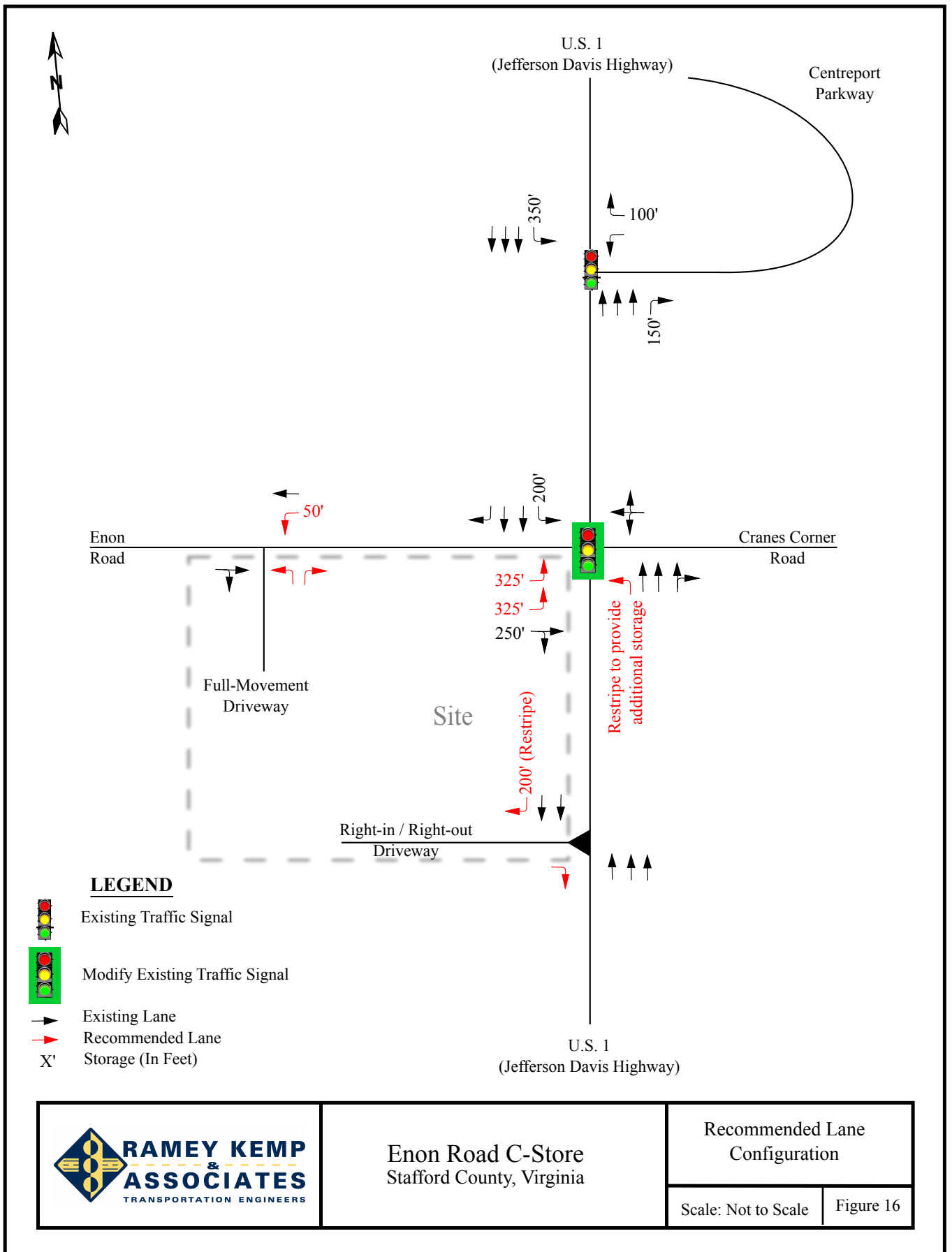


Enon Road C-Store
Stafford County, Virginia

Build (2020) Peak Hour
Traffic Volumes

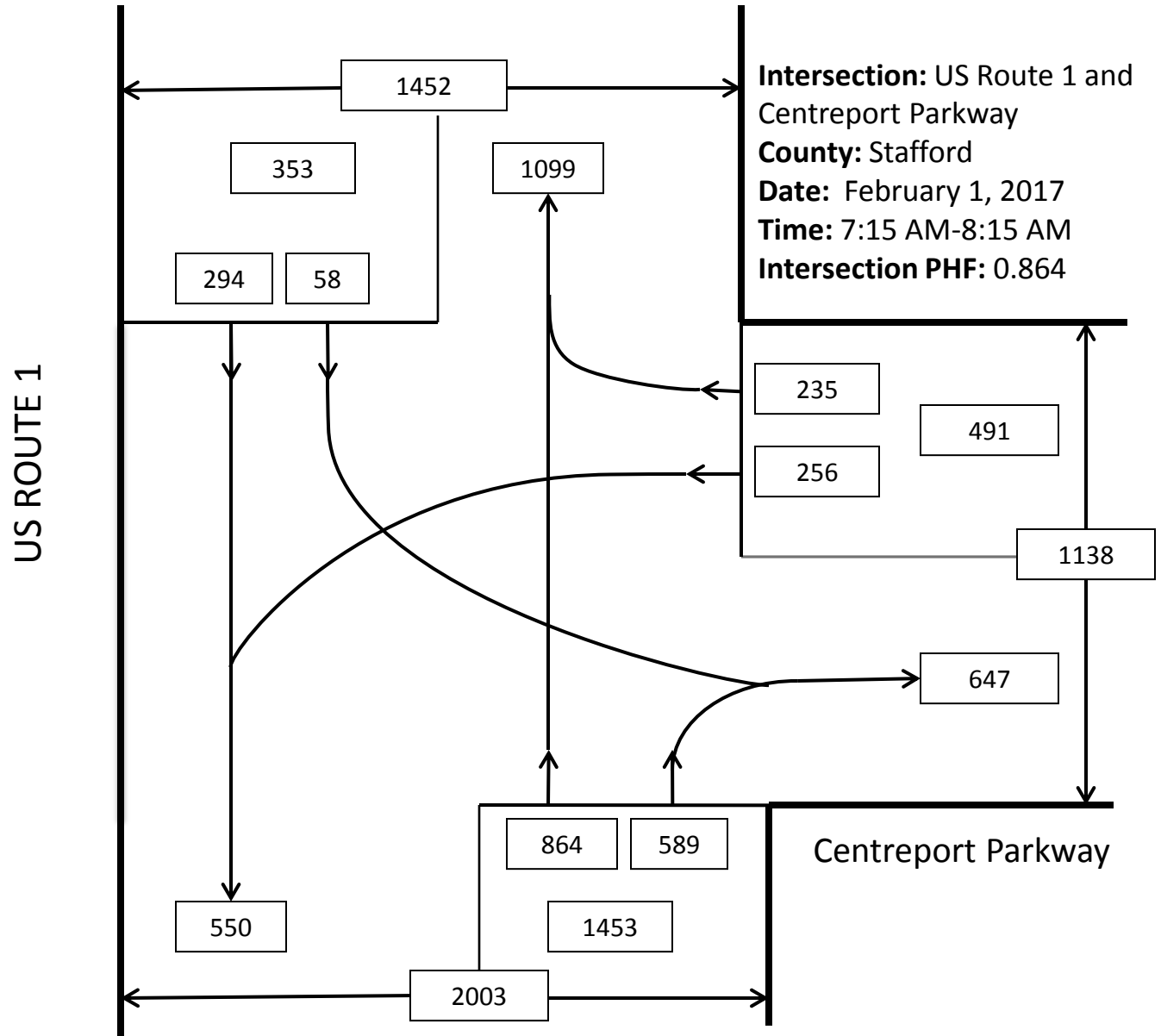
Scale: Not to Scale

Figure 15





AM Peak Hour



AM Peak Hour

Intersection: Enon Rd. and
Porter Lane

County: Stafford

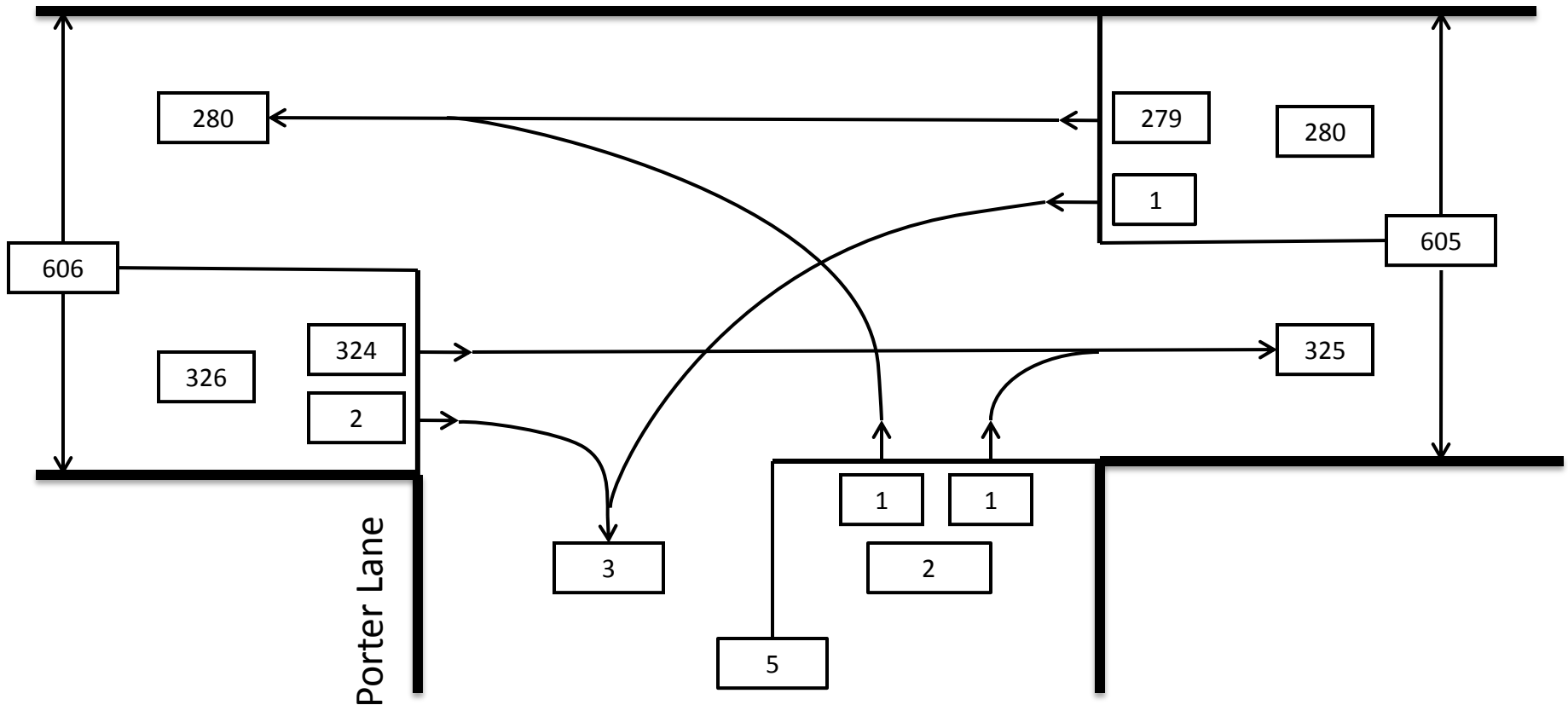
Date: February 1, 2017

Time: 7:15 AM – 8:15 AM

PHF: 0.813

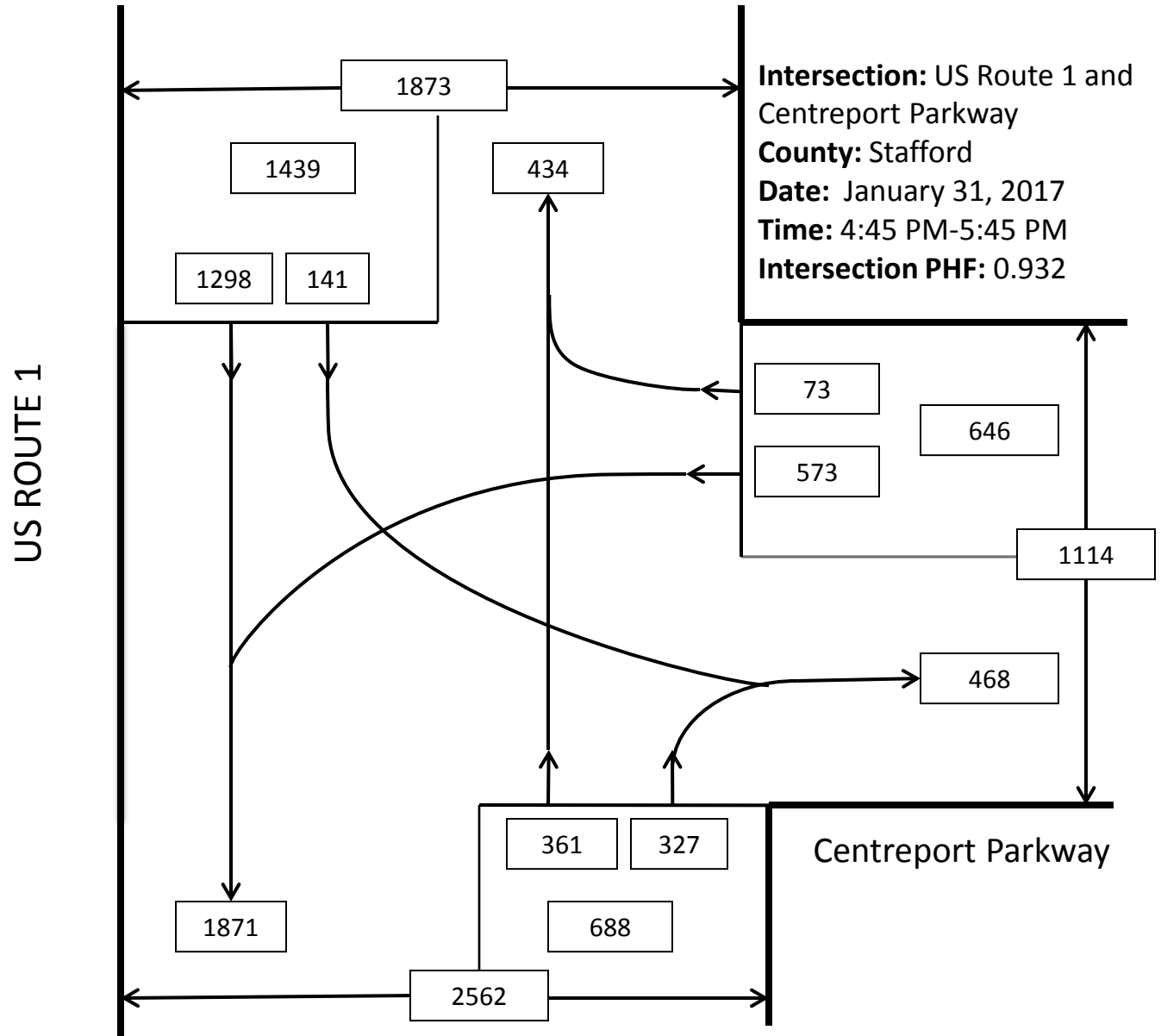


Route 653 (Enon Rd.)





PM Peak Hour



PM Peak Hour

Intersection: Enon Rd. and
Porter Lane

County: Stafford

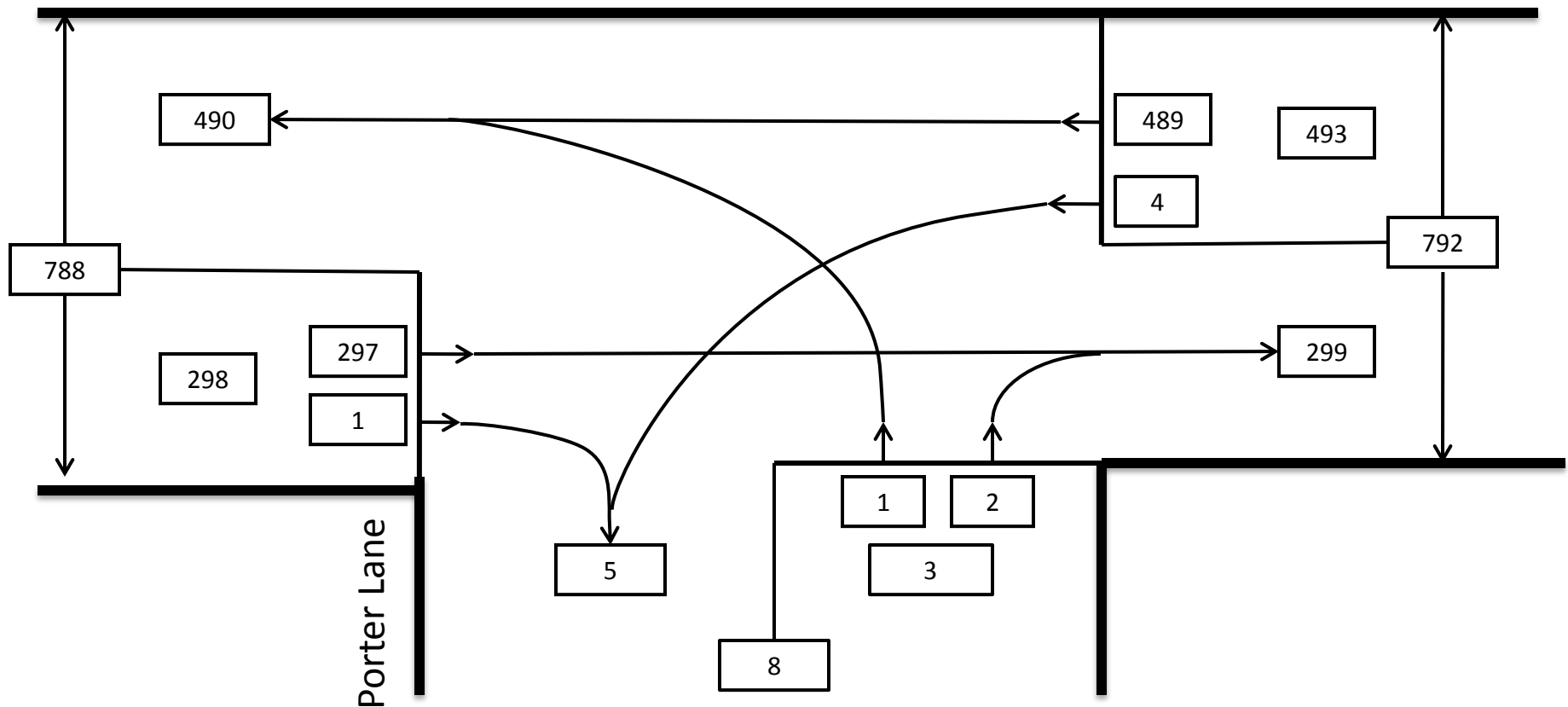
Date: January 31, 2017

Time: 4:30 PM – 5:30 PM

PHF: 0.928



















Route 653 (Enon Rd.)









Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Existing (2018) Conditions
Timing Plan: AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	261	240	932	634	59	300
Future Volume (vph)	261	240	932	634	59	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.189	
Satd. Flow (perm)	1770	1583	5085	1583	352	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		165		755		
Link Speed (mph)	45		45			45
Link Distance (ft)	647		1129			818
Travel Time (s)	9.8		17.1			12.4
Peak Hour Factor	0.82	0.82	0.84	0.84	0.89	0.89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	318	293	1110	755	66	337
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	13.0	24.0
Total Split (s)	43.0	43.0	74.0	74.0	13.0	87.0
Total Split (%)	33.1%	33.1%	56.9%	56.9%	10.0%	66.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Min	Min	None	Min
Act Effect Green (s)	26.3	26.3	54.6	54.6	64.1	64.1
Actuated g/C Ratio	0.26	0.26	0.55	0.55	0.65	0.65
v/c Ratio	0.68	0.54	0.40	0.62	0.18	0.10
Control Delay	44.0	19.7	14.4	3.6	8.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	19.7	14.4	3.6	8.5	7.1
LOS	D	B	B	A	A	A
Approach Delay	32.3		10.0			7.3
Approach LOS	C		B			A
Queue Length 50th (ft)	192	70	148	0	13	26
Queue Length 95th (ft)	292	142	209	31	37	50
Internal Link Dist (ft)	567		1049			738
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	776	786	3646	1348	370	4134
Starvation Cap Reductn	0	0	0	0	0	0

Enon Road C-Store - Stafford County, VA
 1: US 1 & Centreport Parkway

Existing (2018) Conditions
 Timing Plan: AM Peak Hour


						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.37	0.30	0.56	0.18	0.08

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 99.3
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 14.4
 Intersection Capacity Utilization 50.1%
 Analysis Period (min) 15

























Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: US 1 & Centreport Parkway













Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Existing (2018) 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)	345	1	253	5	15	3	549	1218	12	2	392	167
Future Volume (vph)	345	1	253	5	15	3	549	1218	12	2	392	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		250	0		0	450		0	200		0
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1773	1583	0	1811	0	1770	5080	0	1770	3539	1583
Flt Permitted		0.952			0.989		0.950			0.950		
Satd. Flow (perm)	0	1773	1583	0	1811	0	1770	5080	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			293		4			1				
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		578			688			983			1129	
Travel Time (s)		9.9			15.6			14.9			17.1	
Peak Hour Factor	0.85	0.85	0.85	0.48	0.48	0.48	0.83	0.83	0.83	0.69	0.69	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	407	298	0	47	0	661	1481	0	3	568	242
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									2
Detector Phase	4	4	4	3	3		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	13.0	13.0		16.0	16.0		16.0	16.0	16.0
Total Split (s)	35.0	35.0	35.0	13.0	13.0		55.0	66.0		16.0	27.0	27.0
Total Split (%)	26.9%	26.9%	26.9%	10.0%	10.0%		42.3%	50.8%		12.3%	20.8%	20.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effect Green (s)		30.9	30.9		8.7		49.1	73.7		7.9	23.0	23.0
Actuated g/C Ratio		0.25	0.25		0.07		0.39	0.59		0.06	0.18	0.18
v/c Ratio		0.93	0.49		0.36		0.95	0.49		0.03	0.87	0.83
Control Delay		76.4	7.7		62.1		61.9	16.6		58.0	66.0	74.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		76.4	7.7		62.1		61.9	16.6		58.0	66.0	74.7
LOS		E	A		E		E	B		E	E	E
Approach Delay		47.4			62.1			30.6			68.6	
Approach LOS		D			E			C			E	
Queue Length 50th (ft)		341	3		35		535	244		2	250	200
Queue Length 95th (ft)		#497	60		39		#677	318		10	232	218
Internal Link Dist (ft)		498			608			903			1049	
Turn Bay Length (ft)			250				450			200		
Base Capacity (vph)		442	614		135		726	2994		171	655	293
Starvation Cap Reductn		0	0		0		0	0		0	0	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Existing (2018) 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
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.92	0.49		0.35		0.91	0.49		0.02	0.87	0.83

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 125.1

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 42.5

Intersection LOS: D

Intersection Capacity Utilization 77.1%







ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

Splits and Phases: 2: US 1 & Enon Road /Cranes Corner Road

			
Ø1	Ø2	Ø3	Ø4
55 s	27 s	13 s	35 s
			
Ø5	Ø6		
16 s	66 s		






Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Existing (2018) Conditions
Timing Plan: PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	584	74	404	367	144	1324
Future Volume (vph)	584	74	404	367	144	1324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.433	
Satd. Flow (perm)	1770	1583	5085	1583	807	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		42		386		
Link Speed (mph)	45		45			45
Link Distance (ft)	658		1118			723
Travel Time (s)	10.0		16.9			11.0
Peak Hour Factor	0.92	0.92	0.95	0.95	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	635	80	425	386	160	1471
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		6		5	2
Permitted Phases		3		6	2	
Detector Phase	3	3	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	13.0	24.0
Total Split (s)	61.0	61.0	60.0	60.0	34.0	94.0
Total Split (%)	39.4%	39.4%	38.7%	38.7%	21.9%	60.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	63.5	63.5	64.7	64.7	83.5	83.5
Actuated g/C Ratio	0.41	0.41	0.42	0.42	0.54	0.54
v/c Ratio	0.88	0.12	0.20	0.44	0.30	0.54
Control Delay	56.4	14.1	24.6	6.0	20.5	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	14.1	24.6	6.0	20.5	24.5
LOS	E	B	C	A	C	C
Approach Delay	51.6		15.7			24.1
Approach LOS	D		B			C
Queue Length 50th (ft)	580	23	84	41	82	351
Queue Length 95th (ft)	735	56	157	199	131	415
Internal Link Dist (ft)	578		1038			643
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	724	673	2125	886	621	2952
Starvation Cap Reductn	0	0	0	0	0	0

Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Existing (2018) Conditions
Timing Plan: PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.12	0.20	0.44	0.26	0.50

Intersection Summary

Area Type: Other
 Cycle Length: 155
 Actuated Cycle Length: 155
 Offset: 80 (52%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 28.2
 Intersection Capacity Utilization 64.6%
 Analysis Period (min) 15
























Intersection LOS: C
ICU Level of Service C

Splits and Phases: 1: US 1 & Centreport Parkway



Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road













Existing (2018) 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)	182	5	200	5	1	1	169	588	7	4	1535	369
Future Volume (vph)	182	5	200	5	1	1	169	588	7	4	1535	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		250	0		0	450		0	200		0
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1777	1583	0	1763	0	1770	5075	0	1770	3539	1583
Flt Permitted		0.954			0.966		0.950			0.950		
Satd. Flow (perm)	0	1777	1583	0	1763	0	1770	5075	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213		3			2				283
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		580			688			1006			1118	
Travel Time (s)		9.9			15.6			15.2			16.9	
Peak Hour Factor	0.94	0.94	0.94	0.35	0.35	0.35	0.88	0.88	0.88	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	199	213	0	20	0	192	676	0	4	1668	401
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									2
Detector Phase	4	4	4	3	3		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	13.0	13.0		13.0	16.0		13.0	16.0	16.0
Total Split (s)	14.0	14.0	14.0	21.0	21.0		25.0	106.0		14.0	95.0	95.0
Total Split (%)	9.0%	9.0%	9.0%	13.5%	13.5%		16.1%	68.4%		9.0%	61.3%	61.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effect Green (s)		23.9	23.9		9.1		20.3	112.1		8.0	90.4	90.4
Actuated g/C Ratio		0.15	0.15		0.06		0.13	0.72		0.05	0.58	0.58
v/c Ratio		0.73	0.50		0.19		0.83	0.18		0.04	0.81	0.39
Control Delay		78.3	12.1		65.1		93.5	7.2		91.8	29.6	3.9
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.3	0.0
Total Delay		78.3	12.1		65.1		93.5	7.2		91.8	29.9	3.9
LOS		E	B		E		F	A		F	C	A
Approach Delay		44.0			65.1			26.3			25.0	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)		204	0		17		192	65		4	795	65
Queue Length 95th (ft)		#399	84		16		#307	106		m7	901	m22
Internal Link Dist (ft)		500			608			926			1038	
Turn Bay Length (ft)			250				450			200		
Base Capacity (vph)		274	424		196		239	3670		114	2077	1046
Starvation Cap Reductn		0	0		0		0	0		0	86	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Existing (2018) 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
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.73	0.50		0.10		0.80	0.18		0.04	0.84	0.38

Intersection Summary

Area Type: Other

Cycle Length: 155

Actuated Cycle Length: 155

Offset: 53 (34%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 27.9

Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

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: 2: US 1 & Enon Road /Cranes Corner Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
25 s	95 s	21 s	14 s
 Ø5	 Ø6 (R)		
14 s	106 s		







Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

No-Build (2020) Conditions
Timing Plan: AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	272	282	984	662	66	316
Future Volume (vph)	272	282	984	662	66	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.175	
Satd. Flow (perm)	1770	1583	5085	1583	326	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		155		759		
Link Speed (mph)	45		45			45
Link Distance (ft)	647		1129			818
Travel Time (s)	9.8		17.1			12.4
Peak Hour Factor	0.82	0.82	0.84	0.84	0.89	0.89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	332	344	1171	788	74	355
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	13.0	24.0
Total Split (s)	44.0	44.0	73.0	73.0	13.0	86.0
Total Split (%)	33.8%	33.8%	56.2%	56.2%	10.0%	66.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Min	Min	None	Min
Act Effect Green (s)	27.9	27.9	57.5	57.5	66.9	66.9
Actuated g/C Ratio	0.27	0.27	0.55	0.55	0.65	0.65
v/c Ratio	0.70	0.64	0.42	0.65	0.22	0.11
Control Delay	45.3	25.5	15.1	4.3	9.2	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	25.5	15.1	4.3	9.2	7.5
LOS	D	C	B	A	A	A
Approach Delay	35.2		10.7			7.8
Approach LOS	D		B			A
Queue Length 50th (ft)	224	125	173	9	17	30
Queue Length 95th (ft)	304	196	227	44	42	54
Internal Link Dist (ft)	567		1049			738
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	753	762	3480	1323	348	3945
Starvation Cap Reductn	0	0	0	0	0	0

Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

No-Build (2020) Conditions
Timing Plan: AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.45	0.34	0.60	0.21	0.09

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 103.7

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 15.7

Intersection Capacity Utilization 51.8%

Analysis Period (min) 15

Intersection LOS: B

























ICU Level of Service A

Splits and Phases: 1: US 1 & Centreport Parkway













Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

No-Build (2020) 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)	359	1	263	11	19	9	571	1278	14	4	410	174
Future Volume (vph)	359	1	263	11	19	9	571	1278	14	4	410	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		250	0		0	450		0	200		0
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1773	1583	0	1780	0	1770	5075	0	1770	3539	1583
Flt Permitted		0.952			0.986		0.950			0.950		
Satd. Flow (perm)	0	1773	1583	0	1780	0	1770	5075	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			295		9			2				
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		578			688			817			1129	
Travel Time (s)		9.9			15.6			12.4			17.1	
Peak Hour Factor	0.85	0.85	0.85	0.48	0.48	0.48	0.83	0.88	0.83	0.69	0.88	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	423	309	0	82	0	688	1469	0	6	466	252
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									2
Detector Phase	4	4	4	3	3		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	13.0	13.0		16.0	16.0		16.0	16.0	16.0
Total Split (s)	36.0	36.0	36.0	13.0	13.0		55.0	65.0		16.0	26.0	26.0
Total Split (%)	27.7%	27.7%	27.7%	10.0%	10.0%		42.3%	50.0%		12.3%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effect Green (s)		32.0	32.0		8.9		51.0	74.4		8.1	22.0	22.0
Actuated g/C Ratio		0.25	0.25		0.07		0.39	0.57		0.06	0.17	0.17
v/c Ratio		0.97	0.50		0.63		0.99	0.51		0.05	0.78	0.94
Control Delay		84.7	8.4		74.0		71.4	18.0		58.0	61.6	95.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		84.7	8.4		74.0		71.4	18.0		58.0	61.6	95.7
LOS		F	A		E		E	B		E	E	F
Approach Delay		52.5			74.0			35.0			73.4	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)		355	9		61		571	246		5	200	212
Queue Length 95th (ft)		#513	66		57		#721	352		15	255	#229
Internal Link Dist (ft)		498			608			737			1049	
Turn Bay Length (ft)			250				450			200		
Base Capacity (vph)		436	612		131		695	2906		163	599	267
Starvation Cap Reductn		0	0		0		0	0		0	0	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

No-Build (2020) 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
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.97	0.50		0.63		0.99	0.51		0.04	0.78	0.94

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 129.9

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 46.9

Intersection LOS: D

Intersection Capacity Utilization 79.6%

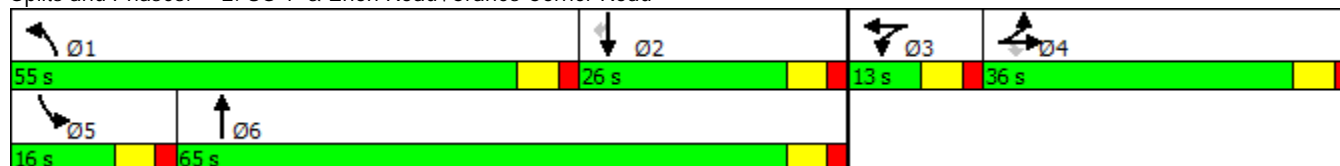
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

Splits and Phases: 2: US 1 & Enon Road /Cranes Corner Road









Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

No-Build (2020) Conditions
Timing Plan: PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	610	81	422	384	173	1388
Future Volume (vph)	610	81	422	384	173	1388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.414	
Satd. Flow (perm)	1656	1583	5085	1583	771	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		44		404		
Link Speed (mph)	45		45			45
Link Distance (ft)	658		1118			723
Travel Time (s)	10.0		16.9			11.0
Confl. Peds. (#/hr)	79					
Peak Hour Factor	0.92	0.92	0.95	0.95	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	663	88	444	404	192	1542
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		6		5	2
Permitted Phases		3		6	2	
Detector Phase	3	3	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	13.0	24.0
Total Split (s)	61.0	61.0	60.0	60.0	34.0	94.0
Total Split (%)	39.4%	39.4%	38.7%	38.7%	21.9%	60.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	66.6	66.6	59.8	59.8	80.4	80.4
Actuated g/C Ratio	0.43	0.43	0.39	0.39	0.52	0.52
v/c Ratio	0.87	0.12	0.23	0.47	0.38	0.58
Control Delay	54.1	14.7	27.0	7.0	22.4	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	14.7	27.0	7.0	22.4	26.8
LOS	D	B	C	A	C	C
Approach Delay	49.4		17.5			26.3
Approach LOS	D		B			C
Queue Length 50th (ft)	605	26	127	45	103	387
Queue Length 95th (ft)	#866	64	m156	m196	148	418
Internal Link Dist (ft)	578		1038			643
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	760	705	1961	858	593	2952

Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

No-Build (2020) Conditions
Timing Plan: PM Peak Hour

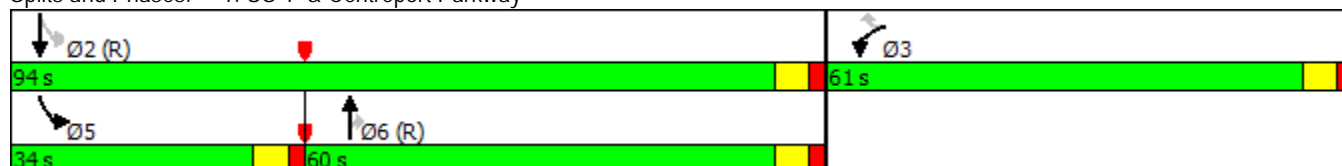
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	23
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.12	0.23	0.47	0.32	0.53

Intersection Summary

Area Type: Other
 Cycle Length: 155
 Actuated Cycle Length: 155
 Offset: 80 (52%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 29.3
 Intersection Capacity Utilization 67.3%
 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.

























Intersection LOS: C
ICU Level of Service C

Splits and Phases: 1: US 1 & Centreport Parkway



Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road













No-Build (2020) 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)	189	8	208	9	2	5	176	612	12	10	1604	384
Future Volume (vph)	189	8	208	9	2	5	176	612	12	10	1604	384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		250	0		0	450		0	200		0
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1777	1583	0	1738	0	1770	5070	0	1770	3539	1583
Flt Permitted		0.954			0.973		0.950			0.950		
Satd. Flow (perm)	0	1777	1583	0	1738	0	1770	5070	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			221		11			4				281
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		580			688			842			1118	
Travel Time (s)		9.9			15.6			12.8			16.9	
Peak Hour Factor	0.94	0.94	0.94	0.35	0.35	0.35	0.88	0.88	0.88	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	210	221	0	46	0	200	709	0	11	1743	417
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									2
Detector Phase	4	4	4	3	3		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	13.0	13.0		13.0	16.0		13.0	16.0	16.0
Total Split (s)	14.0	14.0	14.0	21.0	21.0		25.0	106.0		14.0	95.0	95.0
Total Split (%)	9.0%	9.0%	9.0%	13.5%	13.5%		16.1%	68.4%		9.0%	61.3%	61.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effect Green (s)		19.3	19.3		10.6		20.5	109.9		8.5	90.8	90.8
Actuated g/C Ratio		0.12	0.12		0.07		0.13	0.71		0.05	0.59	0.59
v/c Ratio		0.95	0.57		0.36		0.86	0.20		0.11	0.84	0.40
Control Delay		113.5	13.9		61.2		96.6	8.2		85.0	28.4	2.9
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.4	0.0
Total Delay		113.5	13.9		61.2		96.6	8.2		85.0	28.8	2.9
LOS		F	B		E		F	A		F	C	A
Approach Delay		62.4			61.2			27.6			24.1	
Approach LOS		E			E			C			C	
Queue Length 50th (ft)		~242	0		34		200	68		11	865	14
Queue Length 95th (ft)		#461	87		23		#325	114		m19	943	m34
Internal Link Dist (ft)		500			608			762			1038	
Turn Bay Length (ft)			250				450			200		
Base Capacity (vph)		221	390		200		239	3596		114	2077	1045
Starvation Cap Reductn		0	0		0		0	0		0	70	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

No-Build (2020) 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
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.95	0.57		0.23		0.84	0.20		0.10	0.87	0.40

Intersection Summary

Area Type: Other

Cycle Length: 155

Actuated Cycle Length: 155

Offset: 53 (34%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.1

Intersection LOS: C

Intersection Capacity Utilization 81.0%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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: 2: US 1 & Enon Road /Cranes Corner Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
25 s	95 s	21 s	14 s
 Ø5	 Ø6 (R)		
14 s	106 s		







Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Build (2020) Conditions
Timing Plan: AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	292	282	1002	682	66	335
Future Volume (vph)	292	282	1002	682	66	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.177	
Satd. Flow (perm)	1770	1583	5085	1583	330	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		151		755		
Link Speed (mph)	40		45			45
Link Distance (ft)	633		1131			886
Travel Time (s)	10.8		17.1			13.4
Peak Hour Factor	0.82	0.82	0.84	0.84	0.89	0.89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	356	344	1193	812	74	376
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	16.0	13.0	16.0
Total Split (s)	45.0	45.0	72.0	72.0	13.0	85.0
Total Split (%)	34.6%	34.6%	55.4%	55.4%	10.0%	65.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	Min
Act Effect Green (s)	33.4	33.4	78.0	78.0	88.6	88.6
Actuated g/C Ratio	0.26	0.26	0.60	0.60	0.68	0.68
v/c Ratio	0.78	0.66	0.39	0.65	0.23	0.11
Control Delay	56.9	29.3	15.5	4.6	9.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	29.3	15.5	4.6	9.8	7.9
LOS	E	C	B	A	A	A
Approach Delay	43.3		11.1			8.2
Approach LOS	D		B			A
Queue Length 50th (ft)	278	146	196	20	19	37
Queue Length 95th (ft)	324	197	236	57	43	58
Internal Link Dist (ft)	553		1051			806
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	558	602	3050	1251	327	3464
Starvation Cap Reductn	0	0	0	0	0	0

Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Build (2020) Conditions
Timing Plan: AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.57	0.39	0.65	0.23	0.11

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 0 (0%), Referenced to phase 6:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 17.8
 Intersection Capacity Utilization 53.1%
 Analysis Period (min) 15


























Intersection LOS: B
ICU Level of Service A

Splits and Phases: 1: US 1 & Centreport Parkway















Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Build (2020) 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)	498	1	263	11	19	9	709	1179	14	4	445	179
Future Volume (vph)	498	1	263	11	19	9	709	1179	14	4	445	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		250	0		0	450		0	200		0
Storage Lanes	2		0	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3433	1583	0	0	1780	0	1770	5075	0	1770	3539	1583
Flt Permitted	0.950				0.986		0.950			0.950		
Satd. Flow (perm)	3433	1583	0	0	1780	0	1770	5075	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		309			9			2				
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		686			688			479			1131	
Travel Time (s)		11.7			15.6			7.3			17.1	
Peak Hour Factor	0.85	0.85	0.85	0.48	0.48	0.48	0.83	0.88	0.83	0.69	0.88	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	586	310	0	0	82	0	854	1357	0	6	506	259
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	4	4		3	3		1	6		5	2	4
Permitted Phases												2
Detector Phase	4	4		3	3		1	6		5	2	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0		13.0	13.0		13.0	16.0		13.0	16.0	16.0
Total Split (s)	28.0	28.0		13.0	13.0		65.0	76.0		13.0	24.0	28.0
Total Split (%)	21.5%	21.5%		10.0%	10.0%		50.0%	58.5%		10.0%	18.5%	21.5%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	Min		None	Min	None
Act Effect Green (s)	24.0	24.0			8.9		61.0	82.4		8.1	20.0	48.0
Actuated g/C Ratio	0.18	0.18			0.07		0.47	0.63		0.06	0.15	0.37
v/c Ratio	0.92	0.57			0.63		1.03	0.42		0.06	0.93	0.44
Control Delay	73.6	9.5			74.0		73.0	12.8		58.0	78.9	33.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	73.6	9.5			74.0		73.0	12.8		58.0	78.9	33.9
LOS	E	A			E		E	B		E	E	C
Approach Delay		51.4			74.0			36.1			63.6	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)	253	1			61		~768	183		5	224	163
Queue Length 95th (ft)	#324	62			57		#882	275		15	#317	176
Internal Link Dist (ft)		606			608			399			1051	
Turn Bay Length (ft)	350						450			200		
Base Capacity (vph)	634	544			131		831	3219		122	544	584
Starvation Cap Reductn	0	0			0		0	0		0	0	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Build (2020) 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
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.92	0.57			0.63		1.03	0.42		0.05	0.93	0.44

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 129.9

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 45.7

Intersection LOS: D

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15







~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: US 1 & Enon Road /Cranes Corner Road





 Ø1	 Ø2	 Ø4	 Ø3
65 s	24 s	28 s	13 s
 Ø5	 Ø6		
13 s	76 s		

Enon Road C-Store - Stafford County, VA
3: US 1 & RIRO

Build (2020) Conditions
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	72	0	1902	651	68
Future Vol, veh/h	0	72	0	1902	651	68
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	83	83	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	78	0	2292	930	97

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	465	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	544	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	544	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0	0
HCM LOS	B		






Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	544	-
HCM Lane V/C Ratio	-	0.144	-
HCM Control Delay (s)	-	12.7	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

Enon Road C-Store - Stafford County, VA
4: Full Movement Drive & Enon Road

Build (2020) Conditions
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 6.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	606	36	160	747	36	156
Future Vol, veh/h	606	36	160	747	36	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	82	82	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	713	42	195	911	39	170













Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	755
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	-	-	855
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	855
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	53.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	49	420	-	-	855	-
HCM Lane V/C Ratio	0.799	0.404	-	-	0.228	-
HCM Control Delay (s)	201.8	19.3	-	-	10.5	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	3.3	1.9	-	-	0.9	-







Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Build (2020) Conditions
Timing Plan: PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	624	81	436	398	173	1402
Future Volume (vph)	624	81	436	398	173	1402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200		150	350	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	1583	5085	1583	1770	5085
Flt Permitted	0.950				0.400	
Satd. Flow (perm)	1770	1583	5085	1583	745	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		43		419		
Link Speed (mph)	45		45			45
Link Distance (ft)	659		1121			947
Travel Time (s)	10.0		17.0			14.3
Peak Hour Factor	0.92	0.92	0.95	0.95	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	678	88	459	419	192	1558
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	3		6		5	2
Permitted Phases		3		6	2	
Detector Phase	3	3	6	6	5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	16.0	13.0	16.0
Total Split (s)	61.0	61.0	60.0	60.0	34.0	94.0
Total Split (%)	39.4%	39.4%	38.7%	38.7%	21.9%	60.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	68.8	68.8	57.4	57.4	78.2	78.2
Actuated g/C Ratio	0.44	0.44	0.37	0.37	0.50	0.50
v/c Ratio	0.86	0.12	0.24	0.49	0.39	0.61
Control Delay	51.9	14.6	31.0	10.9	23.5	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	14.6	31.0	10.9	23.5	28.4
LOS	D	B	C	B	C	C
Approach Delay	47.6		21.4			27.9
Approach LOS	D		C			C
Queue Length 50th (ft)	620	26	137	161	105	398
Queue Length 95th (ft)	#909	65	171	229	146	420
Internal Link Dist (ft)	579		1041			867
Turn Bay Length (ft)		200		150	350	
Base Capacity (vph)	785	726	1899	853	574	2952
Starvation Cap Reductn	0	0	0	0	0	0

Enon Road C-Store - Stafford County, VA
1: US 1 & Centreport Parkway

Build (2020) Conditions
Timing Plan: PM Peak Hour

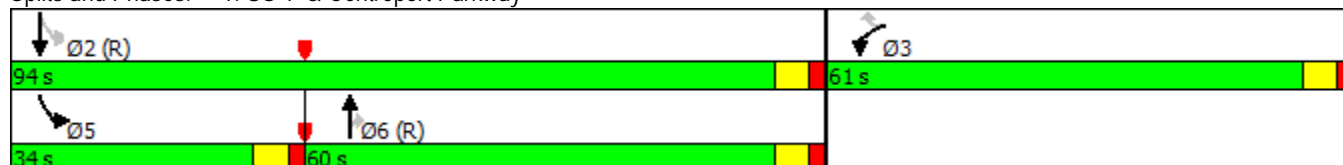
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0	0	0	0	45
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.12	0.24	0.49	0.33	0.54

Intersection Summary

Area Type: Other
 Cycle Length: 155
 Actuated Cycle Length: 155
 Offset: 80 (52%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 30.7
 Intersection Capacity Utilization 68.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: C
ICU Level of Service C



























Splits and Phases: 1: US 1 & Centreport Parkway



Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Build (2020) 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)	251	8	208	9	2	5	238	578	12	10	1628	388
Future Volume (vph)	251	8	208	9	2	5	238	578	12	10	1628	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		250	0		0	450		0	200		0
Storage Lanes	2		0	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3433	1595	0	0	1738	0	1770	5070	0	1770	3539	1583
Flt Permitted	0.950				0.973		0.950			0.950		
Satd. Flow (perm)	3433	1595	0	0	1738	0	1770	5070	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		191			11			4				381
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		689			688			479			1121	
Travel Time (s)		11.7			15.6			7.3			17.0	
Peak Hour Factor	0.92	0.92	0.92	0.35	0.35	0.35	0.88	0.88	0.88	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	235	0	0	46	0	270	671	0	11	1770	422
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	4	4		3	3		1	6		5	2	4
Permitted Phases												2
Detector Phase	4	4		3	3		1	6		5	2	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	16.0	16.0		13.0	13.0		13.0	16.0		13.0	16.0	16.0
Total Split (s)	21.0	21.0		14.0	14.0		25.0	106.0		14.0	95.0	21.0
Total Split (%)	13.5%	13.5%		9.0%	9.0%		16.1%	68.4%		9.0%	61.3%	13.5%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	None
Act Effect Green (s)	16.8	16.8			9.3		25.1	113.8		8.5	90.1	107.7
Actuated g/C Ratio	0.11	0.11			0.06		0.16	0.73		0.05	0.58	0.69
v/c Ratio	0.73	0.69			0.40		0.94	0.18		0.11	0.86	0.35
Control Delay	79.4	26.0			65.8		104.0	7.4		81.5	28.7	0.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.5	0.0
Total Delay	79.4	26.0			65.8		104.0	7.4		81.5	29.1	0.7
LOS	E	C			E		F	A		F	C	A
Approach Delay		54.7			65.8			35.1			24.0	
Approach LOS		D			E			D			C	
Queue Length 50th (ft)	140	42			34		~315	64		11	888	0
Queue Length 95th (ft)	192	139			24		#487	108		m19	964	m0
Internal Link Dist (ft)		609			608			399			1041	
Turn Bay Length (ft)	350						450			200		
Base Capacity (vph)	380	346			122		286	3722		114	2077	1219
Starvation Cap Reductn	0	0			0		0	0		0	72	0

Enon Road C-Store - Stafford County, VA
2: US 1 & Enon Road /Cranes Corner Road

Build (2020) 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
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.72	0.68			0.38		0.94	0.18		0.10	0.88	0.35

Intersection Summary

Area Type: Other

Cycle Length: 155

Actuated Cycle Length: 155

Offset: 53 (34%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 31.5

Intersection LOS: C

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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: 2: US 1 & Enon Road /Cranes Corner Road








			
Ø1	Ø2 (R)	Ø3	Ø4
25 s	95 s	14 s	21 s
			
Ø5	Ø6 (R)		
14 s	106 s		

Enon Road C-Store - Stafford County, VA

3: US 1 & RIRO

Build (2020) Conditions
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				  	 	
Traffic Vol, veh/h	0	103	0	828	1746	99
Future Vol, veh/h	0	103	0	828	1746	99
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	112	0	900	1898	108

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	949	-	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	261	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	261	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.8	0	0
HCM LOS	D		






Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 261	-	-
HCM Lane V/C Ratio	- 0.429	-	-
HCM Control Delay (s)	- 28.8	-	-
HCM Lane LOS	- D	-	-
HCM 95th %tile Q(veh)	- 2	-	-

Enon Road C-Store - Stafford County, VA
4: Full Movement Drive & Enon Road

Build (2020) Conditions
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	391	28	80	548	28	76
Future Vol, veh/h	391	28	80	548	28	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	82	82	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	425	30	98	668	30	83

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	455
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	-	-	1106
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1106
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	17.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	161	617	-	-	1106	-
HCM Lane V/C Ratio	0.189	0.134	-	-	0.088	-
HCM Control Delay (s)	32.5	11.7	-	-	8.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.5	-	-	0.3	-

Queuing and Blocking Report
Enon Road C-Store - Stafford County, VA

Existing (2018) Conditions
PM Peak Hour

Intersection: 1: US 1 & Centreport Parkway

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	614	300	174	178	160	183	294	413	378	310
Average Queue (ft)	433	98	91	87	55	79	85	246	215	151
95th Queue (ft)	668	306	162	160	136	154	203	405	367	287
Link Distance (ft)	588		1049	1049	1049			686	686	686
Upstream Blk Time (%)	7									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)		200				150	350			
Storage Blk Time (%)	37				0	1		2		
Queuing Penalty (veh)	28				0	2		3		

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	T	TR	L	T	T	R
Maximum Queue (ft)	291	201	47	252	90	57	142	19	441	447	127
Average Queue (ft)	168	98	10	155	30	14	48	2	215	225	49
95th Queue (ft)	288	183	37	241	75	46	124	14	390	400	109
Link Distance (ft)	490		621		960	960	960		1049	1049	1049
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		250		450				200			
Storage Blk Time (%)	3	0							8		
Queuing Penalty (veh)	6	0							0		

Network Summary

Network wide Queuing Penalty: 39

Queuing and Blocking Report
Enon Road C-Store - Stafford County, VA

No-Build (2020) Conditions
AM Peak Hour

Intersection: 1: US 1 & Centreport Parkway

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	273	144	192	184	270	240	82	105	57	65
Average Queue (ft)	157	60	96	95	87	117	42	43	14	22
95th Queue (ft)	258	118	174	171	219	225	85	94	44	60
Link Distance (ft)	576		1060	1060	1060			782	782	782
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		200				150	350			
Storage Blk Time (%)	5	0			0	5				
Queuing Penalty (veh)	14	0			2	17				

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	EB	EB	B8	WB	NB	NB	NB	NB	B9	SB	SB	SB
Directions Served	LT	R	T	LTR	L	T	T	TR	T	L	T	T
Maximum Queue (ft)	479	324	81	117	538	729	628	351	85	22	232	231
Average Queue (ft)	297	132	27	48	394	272	197	184	13	3	143	136
95th Queue (ft)	532	349	188	108	611	744	558	332	78	15	225	220
Link Distance (ft)	481		449	621		741	741	741	139		1060	1060
Upstream Blk Time (%)	7		1			3	0		1			
Queuing Penalty (veh)	0		0			0	0		0			
Storage Bay Dist (ft)		250			450					200		
Storage Blk Time (%)	23				15	0					3	
Queuing Penalty (veh)	63				66	0					0	

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	264
Average Queue (ft)	137
95th Queue (ft)	261
Link Distance (ft)	1060
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 163

Queuing and Blocking Report
Enon Road C-Store - Stafford County, VA

No-Build (2020) Conditions
PM Peak Hour

Intersection: 1: US 1 & Centreport Parkway

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	617	299	172	174	157	183	277	435	398	309
Average Queue (ft)	462	97	100	93	65	82	108	270	236	175
95th Queue (ft)	668	303	162	156	137	162	226	419	376	297
Link Distance (ft)	588		1049	1049	1049			686	686	686
Upstream Blk Time (%)	8									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)		200				150	350			
Storage Blk Time (%)	39				0	1	0	3		
Queuing Penalty (veh)	32				1	2	0	5		

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	EB	EB	B8	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	T	LTR	L	T	T	TR	L	T	T	R
Maximum Queue (ft)	331	153	24	61	297	110	84	157	87	467	443	123
Average Queue (ft)	197	60	7	21	169	41	19	57	15	253	268	49
95th Queue (ft)	356	169	65	57	299	96	63	132	75	448	439	111
Link Distance (ft)	483		449	621		766	766	766		1049	1049	1049
Upstream Blk Time (%)	2											
Queuing Penalty (veh)	0											
Storage Bay Dist (ft)		250			450				200			
Storage Blk Time (%)	7									12		
Queuing Penalty (veh)	14									1		

Intersection: 9: Bend

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	155	154
Average Queue (ft)	10	14
95th Queue (ft)	157	182
Link Distance (ft)	766	766
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 55

Queuing and Blocking Report
Enon Road C-Store - Stafford County, VA

Build (2020) Conditions
AM Peak Hour

Intersection: 1: US 1 & Centreport Parkway

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	442	282	229	267	282	211	80	107	70	74
Average Queue (ft)	191	94	111	121	113	111	42	47	22	25
95th Queue (ft)	374	226	206	225	246	208	80	99	58	67
Link Distance (ft)	562		1050	1050	1050			850	850	850
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)		200				150	350			
Storage Blk Time (%)	11	0			2	3				
Queuing Penalty (veh)	33	1			17	12				

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	TR	LTR	L	T	T	TR	L	T	T	R
Maximum Queue (ft)	332	364	296	98	403	454	393	197	22	314	317	217
Average Queue (ft)	215	247	91	40	348	287	166	97	3	192	192	95
95th Queue (ft)	349	384	266	93	461	565	365	190	17	313	320	202
Link Distance (ft)			592	619		404	404	404		1050	1050	1050
Upstream Blk Time (%)			0		13	17	0					
Queuing Penalty (veh)			1		0	113	1					
Storage Bay Dist (ft)	350	350			450				200			
Storage Blk Time (%)	1	5			13	17				14		
Queuing Penalty (veh)	2	12			52	127				1		

Intersection: 3: US 1 & RIRO

Movement	EB	NB	NB	NB	B12	B12	SB
Directions Served	R	T	T	T	T	T	R
Maximum Queue (ft)	52	439	358	2	211	174	4
Average Queue (ft)	22	175	119	0	59	38	0
95th Queue (ft)	45	508	396	3	271	206	6
Link Distance (ft)	114	399	399	399	389	389	
Upstream Blk Time (%)		9	0		4	0	
Queuing Penalty (veh)		0	0		0	0	
Storage Bay Dist (ft)							200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Full Movement Drive & Enon Road

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	34	119	50	89	119
Average Queue (ft)	4	54	3	34	63
95th Queue (ft)	26	102	37	81	108
Link Distance (ft)	444		592	129	129
Upstream Blk Time (%)				0	1
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)		100			
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		12	0		

Network Summary

Network wide Queuing Penalty: 385

Queuing and Blocking Report
Enon Road C-Store - Stafford County, VA

Build (2020) Conditions
PM Peak Hour

Intersection: 1: US 1 & Centreport Parkway

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	614	300	168	180	201	214	337	452	417	368
Average Queue (ft)	460	94	84	94	84	98	116	259	240	180
95th Queue (ft)	705	300	163	169	179	197	262	410	388	327
Link Distance (ft)	589		1040	1040	1040			911	911	911
Upstream Blk Time (%)	15									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)		200				150	350			
Storage Blk Time (%)	41				0	2	0	3		
Queuing Penalty (veh)	34				2	4	0	5		

Intersection: 2: US 1 & Enon Road /Cranes Corner Road

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	TR	LTR	L	T	T	TR	L	T	T	R
Maximum Queue (ft)	209	245	229	71	378	393	342	170	69	528	560	168
Average Queue (ft)	112	166	138	19	283	205	115	63	13	264	285	58
95th Queue (ft)	208	241	221	62	434	477	342	143	59	470	487	149
Link Distance (ft)			594	616		403	403	403		1040	1040	1040
Upstream Blk Time (%)					12	15	0					
Queuing Penalty (veh)					0	42	0					
Storage Bay Dist (ft)	350	350			450				200			
Storage Blk Time (%)					12	15				14		
Queuing Penalty (veh)					23	37				1		

Intersection: 3: US 1 & RIRO

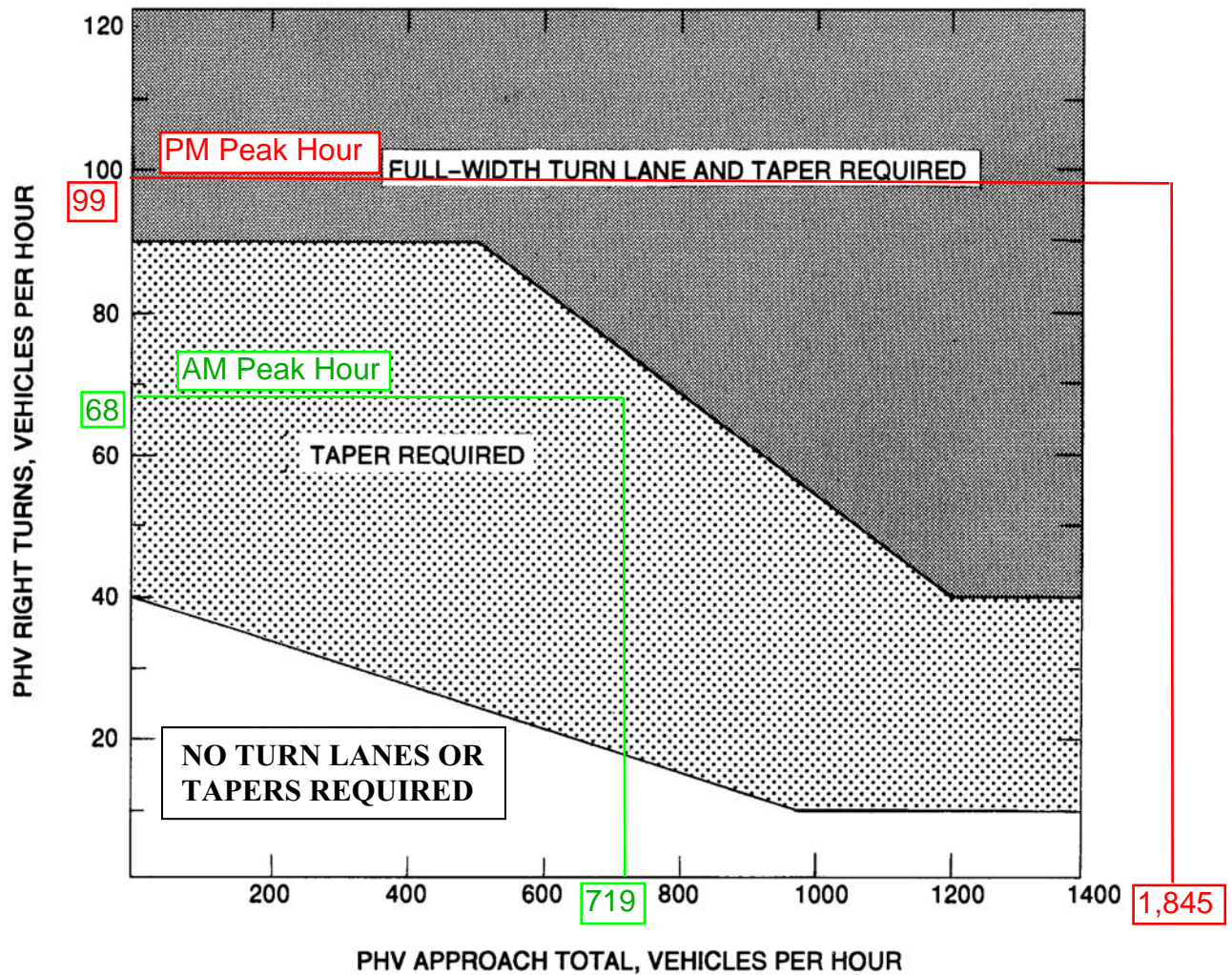
Movement	EB	NB	NB	B12	B12	SB
Directions Served	R	T	T	T	T	T
Maximum Queue (ft)	121	215	161	14	13	9
Average Queue (ft)	57	70	42	4	1	1
95th Queue (ft)	112	296	213	41	18	12
Link Distance (ft)	116	409	409	130	130	403
Upstream Blk Time (%)	2	3	0	1	0	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Full Movement Drive & Enon Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	2	51	41	58
Average Queue (ft)	0	22	17	33
95th Queue (ft)	3	50	44	54
Link Distance (ft)	444		129	129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 148



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)

Enon Road at Full-Movement Driveway
Westbound Left-turn Lane Warrant
Build (2020) Volumes

F-79

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

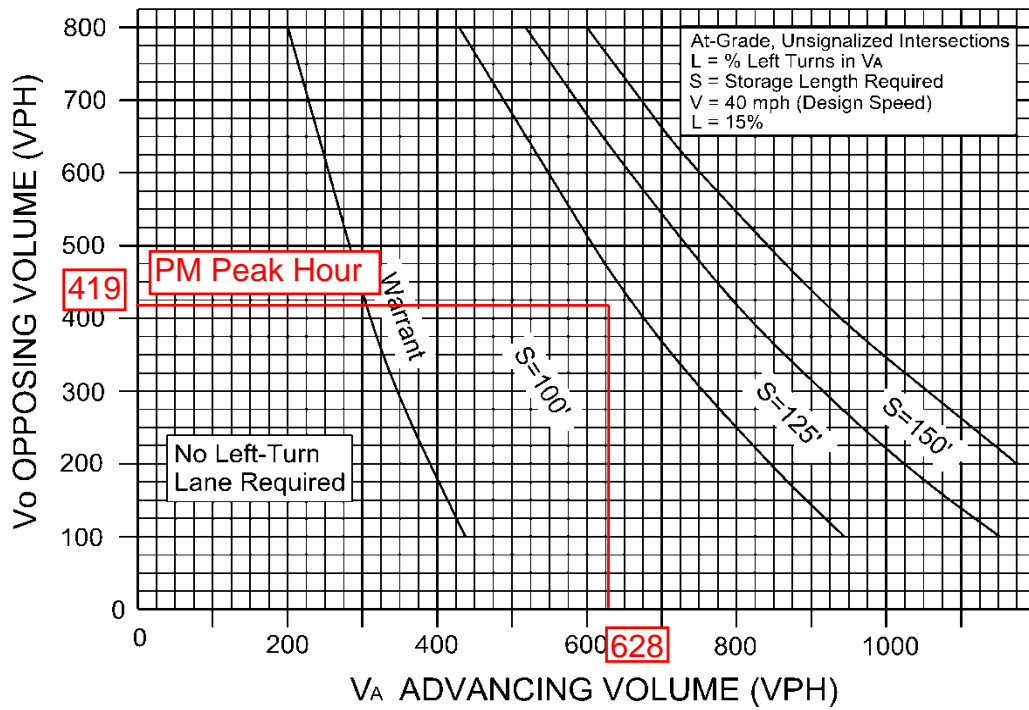


FIGURE 3-7

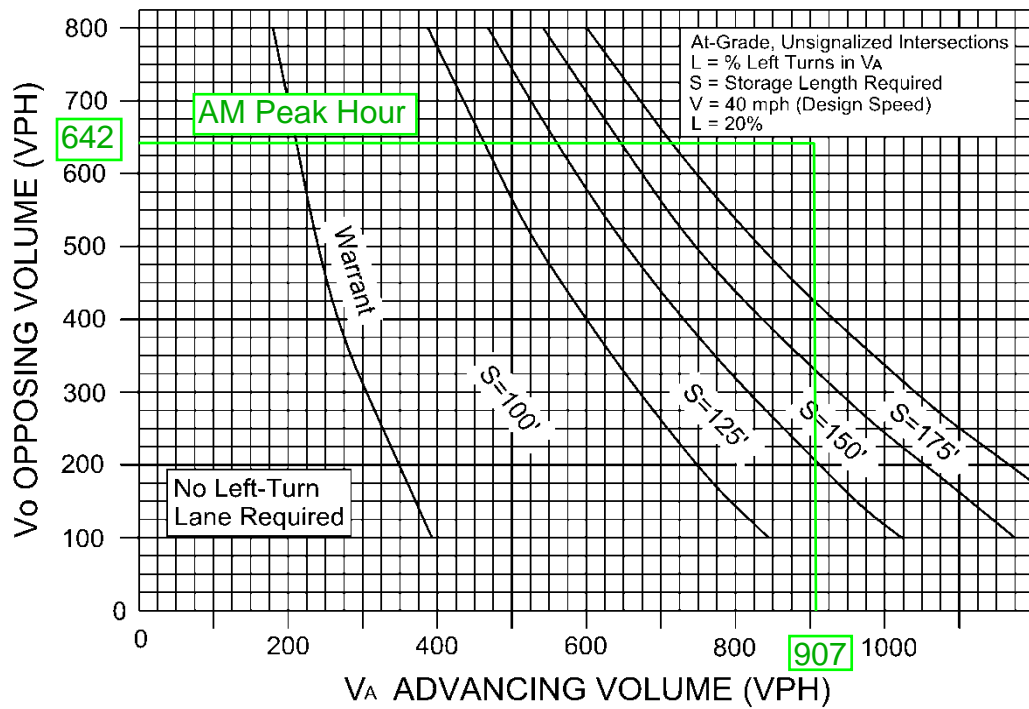
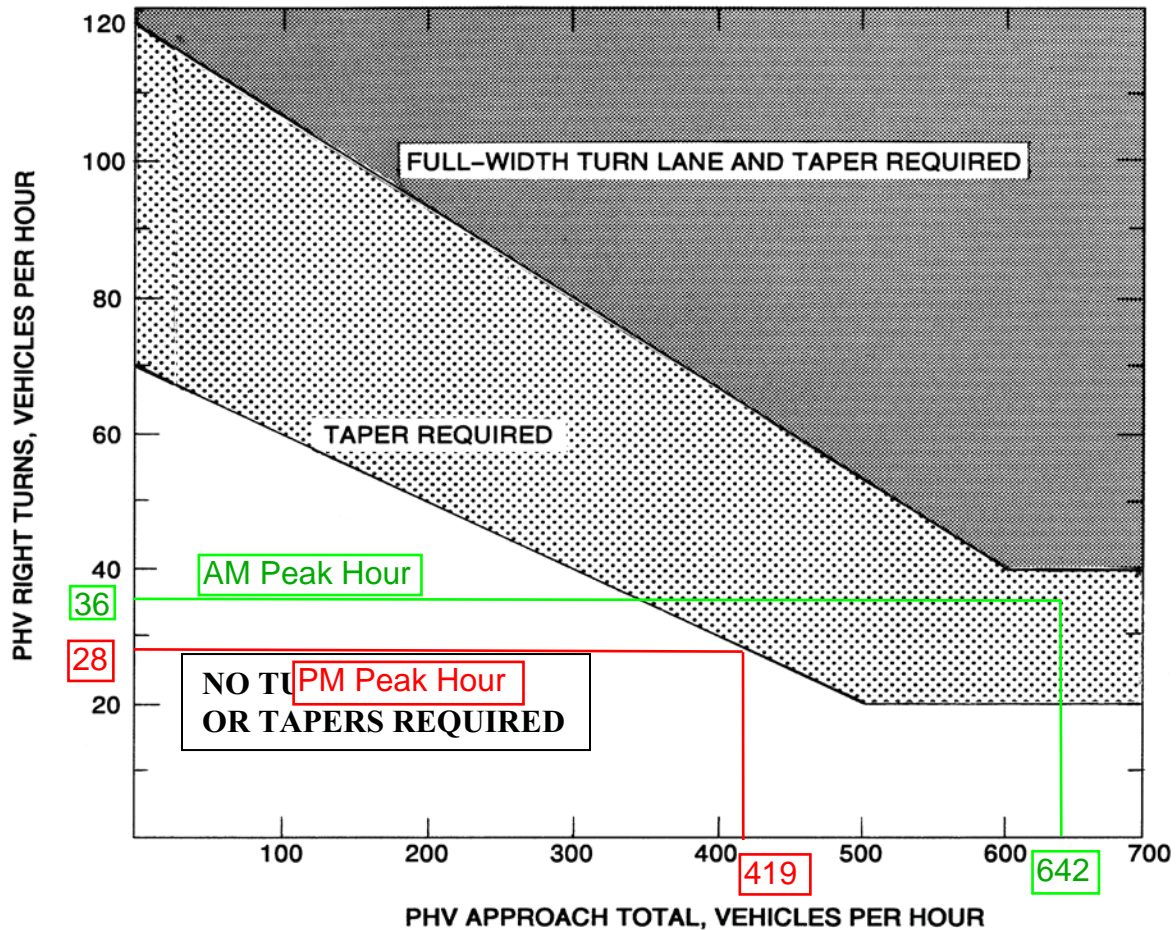


FIGURE 3-8



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)

PRE-SCOPE OF WORK MEETING FORM

Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information

Consultant Name: Tele: E-mail:	Ramey Kemp & Associates, Inc. / Michael Bailey, P.E., PTOE (804) 217-8560 mbailey@rameykemp.com
Developer/Owner Name: Tele: E-mail:	Wack General Contractor / Thomas Wack (540) 372-4565 twack@wackgc.com

Project Information

Project Name:	Enon Road Convenience Store	Locality/County:	Stafford County
Project Location: (Attach regional and site specific location map)	Refer to Figure 1		
Submission Type	Comp Plan <input type="checkbox"/>	Rezoning <input checked="" type="checkbox"/>	Site Plan <input type="checkbox"/> Subd Plat <input type="checkbox"/>
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	The property is located in the southwest quadrant of the US 1 at Enon Road / Cranes Corner Road intersection. The conceptual plan includes a convenience market with 12 fueling positions. The proposed access plan includes one full movement driveway on Enon Road, and one right-in / right-out driveway on US 1.		
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential <input type="checkbox"/>	Commercial <input checked="" type="checkbox"/>	Mixed Use <input type="checkbox"/> Other <input type="checkbox"/>
	Residential Uses(s) Number of Units: _____ ITE LU Code(s): _____ _____ _____ Commercial Use(s) ITE LU Code(s): 960 - 12 f.p. _____ _____ Square Ft or Other Variable: _____		_____ _____ _____ Other Use(s) ITE LU Code(s): _____ _____ _____ Independent Variable(s): _____ _____ _____
Total Peak Hour Trip Projection:	Less than 100 <input type="checkbox"/>	100 – 499 <input type="checkbox"/>	500 – 999 <input checked="" type="checkbox"/> 1,000 or more <input type="checkbox"/>

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Impact Analysis Assumptions			
Study Period	Existing Year: 2018	Build-out Year: 2020	Design Year: 2020
Study Area Boundaries (Attach map)	North: See Figure 1	South:	
	East:	West:	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Cranes Corner Residential Development (See Trip Generation and Figure 2) Potomac Creek Commercial Development (See Trip Generation and Figure 3)		
Consistency With Comprehensive Plan (Land use, transportation plan)	The site is designated on the Future Land Use map as Commerical Corridor / Suburban land use. This use is generally consistent with the recommendations for this land use district. The Transportation Plan recommends widening of US 1 to 6 lanes. Pavement is in place, but additional right-of-way may need to be dedicated across a portion of the US 1 frontage to be consistent with this recommendation.		
Available Traffic Data (Historical, forecasts)	US 1 (Jefferson Davis Highway) - 20,000 vpd in 2010 / 22,000 vpd in 2015 Enon Road - 4,800 vpd in 2010 / 5,900 vpd in 2015		
Trip Distribution (Attach sketch)	Road Name: See Figure 4	Road Name:	
	Road Name:	Road Name:	
Annual Vehicle Trip Growth Rate:	2.0%	Peak Period for Study (check all that apply)	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM <input type="checkbox"/> SAT
		Peak Hour of the Generator	
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.US 1 at Enon Road / Cranes Corner Road	6.	
	2.US 1 at Centreport Parkway	7.	
	3.Enon Road at Proposed full-movement driveway	8.	
	4.US 1 at Proposed Right-in / right-out driveway	9.	
	5.	10.	
Trip Adjustment Factors	Internal allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: _____% trips	Pass-by allowance: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Reduction: ITE% trips	
Software Methodology	<input checked="" type="checkbox"/> Synchro <input type="checkbox"/> HCS (v.2000/+) <input type="checkbox"/> aaSIDRA <input type="checkbox"/> CORSIM <input checked="" type="checkbox"/> Other SimTraffic		
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	Synchro / SimTraffic 9 will be used to analyze LOS, delay, and queueing at the study intersections.		

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Improvement(s) Assumed or to be Considered	The need for turn lanes and other off-site improvements will be determined based on the results of the TIA.		
Background Traffic Studies Considered	None		
Plan Submission	<input type="checkbox"/> Master Development Plan (MDP) <input type="checkbox"/> Preliminary/Sketch Plan	<input checked="" type="checkbox"/> Generalized Development Plan (GDP) <input type="checkbox"/> Other Plan type (Final Site, Subd. Plan)	
Additional Issues to be Addressed	<input checked="" type="checkbox"/> Queuing analysis <input type="checkbox"/> Merge analysis <input type="checkbox"/> TDM Measures	<input type="checkbox"/> Actuation/Coordination <input checked="" type="checkbox"/> Bike/Ped Accommodations <input checked="" type="checkbox"/> Other AME Request	<input type="checkbox"/> Weaving analysis <input checked="" type="checkbox"/> Intersection(s)

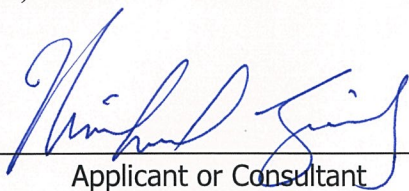
NOTES on ASSUMPTIONS:

The traffic counts performed by RKA in January 2017 will be grown by 2.0% for one year to estimate the current 2018 traffic conditions.

The TIA will include three analysis scenarios:

- Existing (2018) Traffic Conditions
- No-Build (2020) Traffic Conditions
- Build (2020) Traffic Conditions

SIGNED: _____


Applicant or Consultant

DATE: _____

3/21/18

PRINT NAME: _____

Michael Bailey
Applicant or Consultant

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

PRE-SCOPE OF WORK MEETING FORM

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	Residential Uses(s) Number of Units: _____ ITE LU Code(s): _____ _____ _____ Commercial Use(s) ITE LU Code(s): 960 - 12 f.p. _____ _____ Square Ft or Other Variable: _____		_____ _____ _____ Other Use(s) ITE LU Code(s): _____ _____ _____ Independent Variable(s): _____ _____ _____
Total Peak Hour Trip Projection:	Less than 100 <input type="checkbox"/>	100 – 499 <input type="checkbox"/>	500 – 999 <input checked="" type="checkbox"/> 1,000 or more <input type="checkbox"/>

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

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	Road Name:	Road Name:	
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		Peak Hour of the Generator	
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.US 1 at Enon Road / Cranes Corner Road	6.	
	2.US 1 at Centreport Parkway	7.	
	3.Enon Road at Proposed full-movement driveway	8.	
	4.US 1 at Proposed Right-in / right-out driveway	9.	
	5.	10.	
Trip Adjustment Factors	Internal allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: ____% trips	Pass-by allowance: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Reduction: ITE% trips	
Software Methodology	<input checked="" type="checkbox"/> Synchro <input type="checkbox"/> HCS (v.2000/+) <input type="checkbox"/> aaSIDRA <input type="checkbox"/> CORSIM <input checked="" type="checkbox"/> Other SimTraffic		
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	Synchro / SimTraffic 9 will be used to analyze LOS, delay, and queueing at the study intersections.		

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Improvement(s) Assumed or to be Considered	The need for turn lanes and other off-site improvements will be determined based on the results of the TIA.		
Background Traffic Studies Considered	None		
Plan Submission	<input type="checkbox"/> Master Development Plan (MDP) <input type="checkbox"/> Preliminary/Sketch Plan	<input checked="" type="checkbox"/> Generalized Development Plan (GDP) <input type="checkbox"/> Other Plan type (Final Site, Subd. Plan)	
Additional Issues to be Addressed	<input checked="" type="checkbox"/> Queuing analysis <input type="checkbox"/> Merge analysis <input type="checkbox"/> TDM Measures	<input type="checkbox"/> Actuation/Coordination <input checked="" type="checkbox"/> Bike/Ped Accommodations <input checked="" type="checkbox"/> Other AME Request	<input type="checkbox"/> Weaving analysis <input checked="" type="checkbox"/> Intersection(s)

NOTES on ASSUMPTIONS:

The traffic counts performed by RKA in January 2017 will be grown by 2.0% for one year to estimate the current 2018 traffic conditions.

The TIA will include three analysis scenarios:

- Existing (2018) Traffic Conditions
- No-Build (2020) Traffic Conditions
- Build (2020) Traffic Conditions

SIGNED: _____


Applicant or Consultant

DATE: _____

3/21/18

PRINT NAME: _____

Michael Bailey
Applicant or Consultant

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

SCOPE OF WORK MEETING CONCLUSIONS**ADDITIONS TO THE VDOT REQUIRED ELEMENTS, CHANGES TO THE
METHODOLOGY OR STANDARD ASSUMPTIONS, AND SIGNATURE PAGE**

Any additions to the VDOT Required Elements or changes to the Methodology or Standard Assumptions due to special circumstances that are approved by VDOT:

N/A

The applicant will contact VDOT and the locality prior to the preparation of the traffic impact analysis study in the event there are any substantial changes in the existing conditions that will affect the scope of the study.

AGREED:

Michael Bailey
Applicant or Consultant

DATE:

3/27/2018

PRINT NAME:

Michael Bailey, P.E., PTOE
Applicant or Consultant

SIGNED:

David L. Beale
VDOT Representative

DATE:

3/27/18

PRINT NAME:

DAVID L. BEALE
VDOT Representative

SIGNED:

Charles J. Hess
Local Government Representative

DATE:

3/30/18

PRINT NAME:

Charles J. Hess
Local Government Representative

TIA SCOPING MEETING SIGN-IN SHEET

Project: Enon Road Convenience Store Meeting Date: 3-12-18
 County: Stafford Place/Room: VDOT

Name (check if present)	Company	Phone	E-Mail
<input checked="" type="checkbox"/> David Beale	VDOT - TLU	540-654-1973	david.beale@vdot.virginia.gov
<input type="checkbox"/> Stephen Haynes	VDOT - Planning	540-899-4709	stephen.haynes@vdot.virginia.gov
<input type="checkbox"/> Bill Arel	VDOT- L& D	540-8994494	william.arel@vdot.virginia.gov
<input checked="" type="checkbox"/> Peter Hedrich	VDOT - Traffic Eng.	540-899-4540	peter.hedrich@vdot.virginia.gov
<input checked="" type="checkbox"/> Margaret Niemann	VDOT - TLU	540-899-4106	margaret.niemann@vdot.virginia.gov
<input checked="" type="checkbox"/> Jacob Herrman	VDOT - Planning	540-899-4490	jacob.herrman@vdot.virginia.gov
<input type="checkbox"/> Ali Farhangi	VDOT- Traffic Eng	540-899-4544	Ali.Farhangi@vdot.virginia.gov
<input type="checkbox"/> Mike Zuraf	Stafford County	540-658-8668	MZuraf@staffordcountyva.gov
<input checked="" type="checkbox"/> Joey Hess	Stafford County	540-658-4611	JHess@staffordcountyva.gov
<input checked="" type="checkbox"/> Brian Geouge	Stafford County	540-658-8668	BGeouge@staffordcountyva.gov
Carl Hultgren	Ramay Kemp	804-217-8560	chultgren@ramaykemp.com
Delonae Lane	Shetty/L+H	540-659-5155	delonae.lane@msu.com
JUSTIN FRANKLIN	FAIRBANKS & FRANKLIN	540-899-3700	franklin@ff-pc.com
Arturo Ruiz	VDOT-CDP		Arturo.ruiz@vdot.virginia.gov
DILSHAD SHAMS	VDOT-CDP		DILSHAD.SHAMS@ " " "