

August 23, 2019

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

**Subject:** 7-Eleven – Deacon Road – Revised Traffic Impact Analysis (TIA)

Dear Mr. Zuraf,

Enclosed for your review and approval is the revised Traffic Impact Analysis (TIA) we have prepared for the proposed convenience store with 12 fueling positions (f.p.) that will replace the existing 7-Eleven store located in the northeast quadrant of the Route 607 (Deacon Road) at Route 626 (Leeland Road) intersection. The original TIA was submitted in March 21, 2019, and VDOT provided review comments in a letter dated June 17.

Following is a brief response to each review comment:

**Traffic Engineering Comments:**

1. For the Leeland entrance, our previously expressed preference for a ri/ro driveway only. The left in could become problematic. Is there a reason why does their driveway angle closer to the intersection instead of following the property line? The entrance should be located as close to the property line as possible. A condition should be included in any approval that they will close this driveway and share with the adjacent parcel should the opportunity arise. Also, VDOT reserves the right to install a median in Leeland Road to prohibit lefts if they become problematic.
  - The partial access driveway is located as far north as the property line allows. Additionally, the existing site access is being improved at this intersection because a full-movement driveway located closer to the signal is being closed and replaced by a partial access farther away from the signal.
2. For the Deacon Road entrance, count the traffic at Jett Street and include that in the analysis of the full movement entrance. Please show how 7-Eleven's proposed driveway would interact with Jett Street.
  - Jett Street has been added to the analysis and the full-movement driveway will align with Jett Street.

**Planning Comments:**

1. For the Deacon Road Access Point: The left turns will conflict in a way that could produce problems. The left-ins are shown in the approximate locations shown on the plan. Lefts-out should also be considered. Lefts into the 7-Eleven will be from the EB thru-lane. Is there an alternative that will avoid should of these conflicts? See attached sketch.
  - The proposed full-movement driveway will align with Jett Street.

**Land Development and GDP Comments:**

1. The project must meet current VDOT design standards and specifications, SSAR and access management. A GDP should show the sight distance, VPD at entrances, functional classification and all spacing dimensions for all the roads and access points. Please provide all details on the site plan when submitted.
  - Noted
2. The Exhibit B did not provide sufficient information for access management. The access points appear they are within the functional area of the intersection and do not appear to meet spacing standard for access management. They will require an exception if they do not meet the spacing requirements.
  - Noted, and access management exception request will be submitted.

Sincerely,  
***Ramey Kemp & Associates, Inc.***



Michael Bailey, P.E., PTOE  
Project Manager

Enclosure

Copy to: Mr. David Beale, P.E., VDOT  
Mr. Peter Hedrich, P.E., PTOE, VDOT  
Ms. Margaret Niemann, VDOT  
Mr. Brian Geouge, Stafford County  
Mr. Steve Blevins, P.E., Blakeway Corporation

August 23, 2019

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

Reference: 7-Eleven – Deacon Road – Revised Traffic Impact Analysis (TIA) and Access Management  
Exception (AME) Request  
Stafford County, Virginia

Dear Mr. Zuraf,

Ramey Kemp & Associates, Inc. (RKA) has performed a Traffic Impact Analysis (TIA) for the proposed convenience store with 12 fueling positions (f.p.) that will replace the existing 7-Eleven store located in the northeast quadrant of the Route 607 (Deacon Road) at Route 626 (Leeland Road) intersection.

The proposed access plan includes narrowing the existing full-movement driveway on Leeland Road, and removing the outbound left-turn movement. The existing right-in / right-out driveway on Deacon Road will be shifted west to align with Jett Street, and will be converted to full-movement.

If approved, the proposed store is expected to be built in 2020. Figure 1 shows the site location and study intersections, and Figure 2 shows the preliminary site plan.

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

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

#### **Existing Roadway Conditions**

Route 607 (Deacon Road) is a four-lane divided Major Collector with a 2019 average daily traffic (ADT) volume of approximately 3,000 vehicles per day (vpd), and a posted speed limit of 45 miles per hour (mph) in the vicinity of the site.

Route 626 (Leeland Road) is a two-lane Major Collector with a 2019 ADT volume of approximately 3,700 vpd, and a posted speed limit of 35 mph in the vicinity of the site.

Jett Street is a two-lane local roadway with a 2019 ADT volume of approximately 600 vpd and a posted speed limit of 25 mph in the vicinity of the site.

Note that the ADTs were calculated assuming the AM and PM peak hour volumes represent 20% of the daily traffic.

### Existing Traffic Volumes

The AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were conducted by Burns Services, Inc. at the following intersections during the week of February 18:

- Deacon Road at Leeland Road
- Deacon Road at existing Right-in / Right-out Driveway
- Leeland Road at existing Full-movement Driveway

The AM peak hour and PM peak hour turning movement counts were conducted by Technical Traffic Services for Deacon Road at Jett Street during the week of August 12.

The traffic count data is enclosed, and the existing 2019 volumes are shown in Figure 3.

### Background Traffic Growth

The 2019 peak hour traffic volumes were grown by an annual rate of 3.0% for one year to estimate the 2020 peak hour traffic volumes. Figure 3 shows the estimated 2020 no-build peak hour traffic volumes.

### Trip Generation

The trip generation potential of the proposed store 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 – 10<sup>th</sup> Edition*. Based on discussion with VDOT, the trip generation potential of the proposed 7-Eleven store was estimated using the multi-variable regression formula published by ITE. Table 1 shows the ITE trip generation potential of the proposed 3,250 s.f. convenience store with 12 fueling positions.

**Table 1**  
**ITE Trip Generation – 10<sup>th</sup> 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. / 3,250 s.f.	1,383	1,383	75*	75*	91*	91*
ITE Pass-By Trips – 63% AM / 66% PM		-892	-892	-47	-47	-60	-60
<b>Net New External Trips</b>		<b>491</b>	<b>491</b>	<b>28</b>	<b>28</b>	<b>31</b>	<b>31</b>

\* 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 store in the future because it is convenient. The ITE pass-by rates are shown in Table 1. To be conservative, the existing site driveway volumes were not removed from the surrounding roadway network.

### Site Traffic Distribution

The following primary site traffic distribution was applied based on a review of the existing store driveway volumes:

- 40% to / from the north on Leeland Road
- 35% to / from the west on Deacon Road
- 25% to / from the east on Deacon Road

Based on the historical ADT's, it was assumed that 45% of the total pass-by trips will originate from Deacon Road, and 55% of the total pass-by trips will originate from Leeland Road.

The following directional distributions were applied to Deacon Road:

- AM Peak – 60% westbound / 40% eastbound
- PM Peak – 45% westbound / 55% eastbound

The following directional distributions were applied to Leeland Road:

- AM Peak – 45% northbound / 55% southbound
- PM Peak – 50% northbound / 50% southbound

Figure 4 shows the primary and pass-by site trip distributions, Figure 5 shows the primary and pass-by site trip assignments, and Figure 6 shows the total site trips and projected 2020 build-out peak hour traffic volumes.

### VDOT Turn Lane Warrant Analysis

The projected build-out AM and PM peak hour traffic volumes at the proposed site driveways were compared to the turn lane warrants in the Virginia Department of Transportation (VDOT) *Access Management Design Standards for Entrances and Intersections*.

#### Deacon Road at Jett Street / Full-Movement Driveway:

- A westbound right-turn lane on Deacon Road is not warranted
- An eastbound left-turn lane on Deacon Road is not warranted

#### Leeland Road at Partial Access Driveway:

- A northbound right-turn lane on Leeland Road is not warranted
- A southbound left-turn lane on Leeland Road is not warranted

The turn lane warrant diagrams are enclosed for reference, and Figure 7 shows the recommended roadway laneage at the proposed driveways.

### Intersection Spacing Standards

VDOT requires at least 335 feet of separation between traffic signals and full-movement access driveways on Collector roadways posted 45 mph. The proposed full-movement driveway on Deacon Road is approximately 220 feet east of Leeland Road, which does not meet the VDOT minimum spacing standards.

VDOT requires at least 250 feet of separation between traffic signals and partial access driveways on Collector roadways posted 35 mph. The proposed partial access driveway on Leeland Road is approximately 130 feet north of Deacon Road, which does not meet the VDOT minimum spacing standards. An AME request form will be submitted for both entrances.

### Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 10, which is a comprehensive software package that allows the user to model signalized and unsignalized intersections to determine levels-of-service based on the thresholds specified in the Highway Capacity Manual (HCM) – 6<sup>th</sup> Edition.

Table 2 summarizes the capacity analysis results for the signalized intersection of Deacon Road at Leeland Road, and the Synchro outputs are enclosed for reference.

**Table 2**  
**Level-of-Service Summary for Deacon Road at Leeland Road**

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing (2019) Traffic Conditions	EBL	A	3.3	22	A (5.9 sec)	A	6.8	61	A (7.7 sec)
	EBT	A	2.6	7		A	4.9	22	
	WBT/R	A	9.4	27		B	13.4	44	
	SBL	B	12.9	22		B	19.0	45	
	SBR	A	3.1	15		A	2.1	22	
No-Build (2020) Traffic Conditions	EBL	A	3.3	22	A (6.0 sec)	A	6.9	64	A (7.8 sec)
	EBT	A	2.6	8		A	4.9	23	
	WBT/R	A	9.4	28		B	13.5	45	
	SBL	B	13.0	23		B	19.2	46	
	SBR	A	3.1	15		A	2.1	22	
Build (2020) Traffic Conditions	EBL	A	3.2	24	A (6.1 sec)	A	6.9	67	A (8.2 sec)
	EBT	A	2.5	7		A	4.8	22	
	WBT/R	A	9.5	32		B	14.5	53	
	SBL	B	13.3	20		B	19.6	44	
	SBR	A	3.2	15		A	2.2	22	

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

Under build conditions, the intersection is expected to continue to operate at LOS A during the AM and PM peak hours with all movements at LOS B or better. Note that the southbound queues are less than 50 feet which will not block the proposed site driveway on Leeland Road.

Table 3 summarizes the capacity analysis results for the unsignalized intersection of Deacon Road at Jett Street / Full-movement Driveway, and the Synchro outputs are enclosed for reference.

**Table 3**  
**Level-of-Service Summary for Deacon Road at Jett Street / Full-Movement Driveway**

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing (2019) Traffic Conditions	EBT	-	-	-	N/A <sup>3</sup>	-	-	-	N/A <sup>3</sup>
	EBR	-	-	-		-	-	-	
	WBL <sup>2</sup>	A	7.4	0		A	7.7	0	
	WBT	-	-	-		-	-	-	
	NBL/R <sup>1</sup>	A	9.3	3		B	10.3	3	
No-Build (2020) Traffic Conditions	EBT	-	-	-	N/A <sup>3</sup>	-	-	-	N/A <sup>3</sup>
	EBR	-	-	-		-	-	-	
	WBL <sup>2</sup>	A	7.4	0		A	7.7	0	
	WBT	-	-	-		-	-	-	
	NBL/R <sup>1</sup>	A	9.3	3		B	10.4	3	
Build (2020) Traffic Conditions	EBL/T <sup>2</sup>	A	7.5	0	N/A <sup>3</sup>	A	7.6	0	N/A <sup>3</sup>
	EBR	-	-	-		-	-	-	
	WBL <sup>2</sup>	A	7.4	0		A	7.7	0	
	WBT/R	-	-	-		-	-	-	
	NBL/T/R <sup>1</sup>	A	9.6	5		B	11.0	3	
	SBL/T/R <sup>1</sup>	A	9.4	5		B	10.8	8	

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 currently operates with short delays (less than 25 seconds) in both the AM and PM peak hours. Under no-build conditions, the minor street left-turn movement is expected to continue to operate with short delays (less than 25 seconds) in the AM and PM peak hours.

Under build conditions, capacity analysis indicates that the minor street left-turn movement is expected to operate with short delays (less than 25 seconds) during the AM and PM peak hours with queue lengths less than one vehicle.

Table 4 summarizes the capacity analysis results for the unsignalized intersection of Leeland Road at Partial Access Driveway, and the Synchro outputs are enclosed for reference.

**Table 4**  
**Level-of-Service Summary for Leeland Road at Partial Access Driveway**

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Build (2020) Traffic Conditions	WBR <sup>1</sup>	A	8.9	3	N/A <sup>3</sup>	B	10.1	3	N/A <sup>3</sup>
	NBT/R	-	-	-		-	-	-	
	SBL/T <sup>2</sup>	A	7.5	3		A	8.0	3	

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.

Under build conditions, capacity analysis indicates that the minor street right-turn movement is expected to operate with short delays (less than 25 seconds) during the AM and PM peak hours with queue lengths less than one vehicle.



### **Recommendations**

Based on the trip generation potential of the proposed 7-Eleven store, the following improvements are recommended:

#### Deacon Road at Full-Movement Driveway

- Construct site driveway with one ingress lane and one egress lane

#### Leeland Road at Partial Access Driveway

- 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.

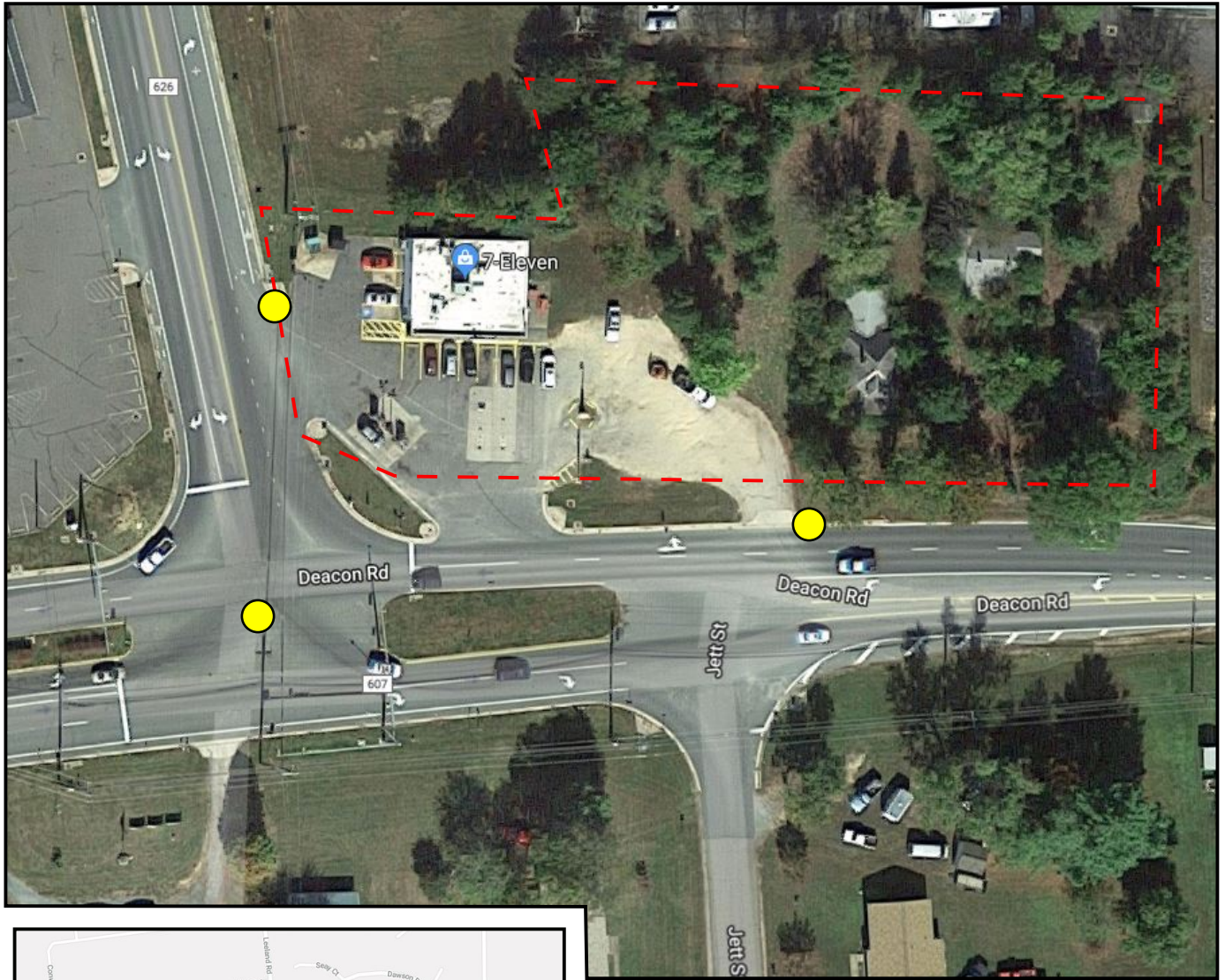
Sincerely yours,  
*Ramey Kemp & Associates, Inc.*



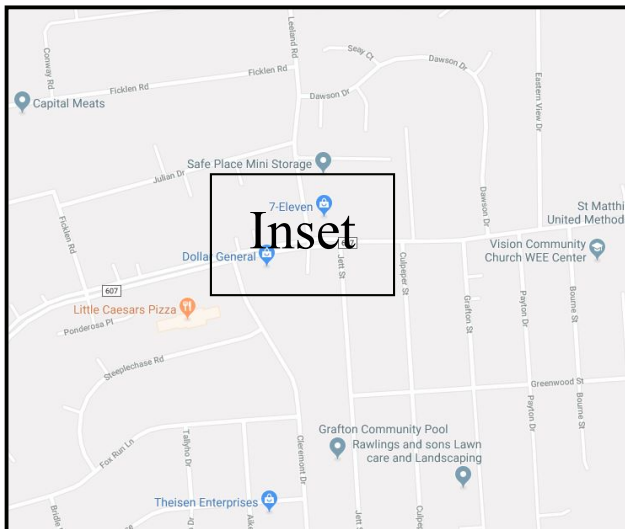
Michael Bailey, P.E., PTOE  
Project Manager

Enclosures: Figures, VDOT turn lane warrant diagrams, Traffic count data, Synchro outputs

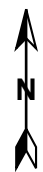
Copy to: Mr. David Beale, P.E., VDOT  
Mr. Peter Hedrich, P.E., PTOE, VDOT  
Ms. Margaret Niemann, VDOT  
Mr. Brian Geouge, Stafford County  
Mr. Steve Blevins, P.E., Blakeway Corporation



Inset



Overview



### LEGEND



Study Intersection



Site Boundary



7-Eleven  
Deacon Road  
Stafford County, Virginia

Site Location and  
Study Intersections

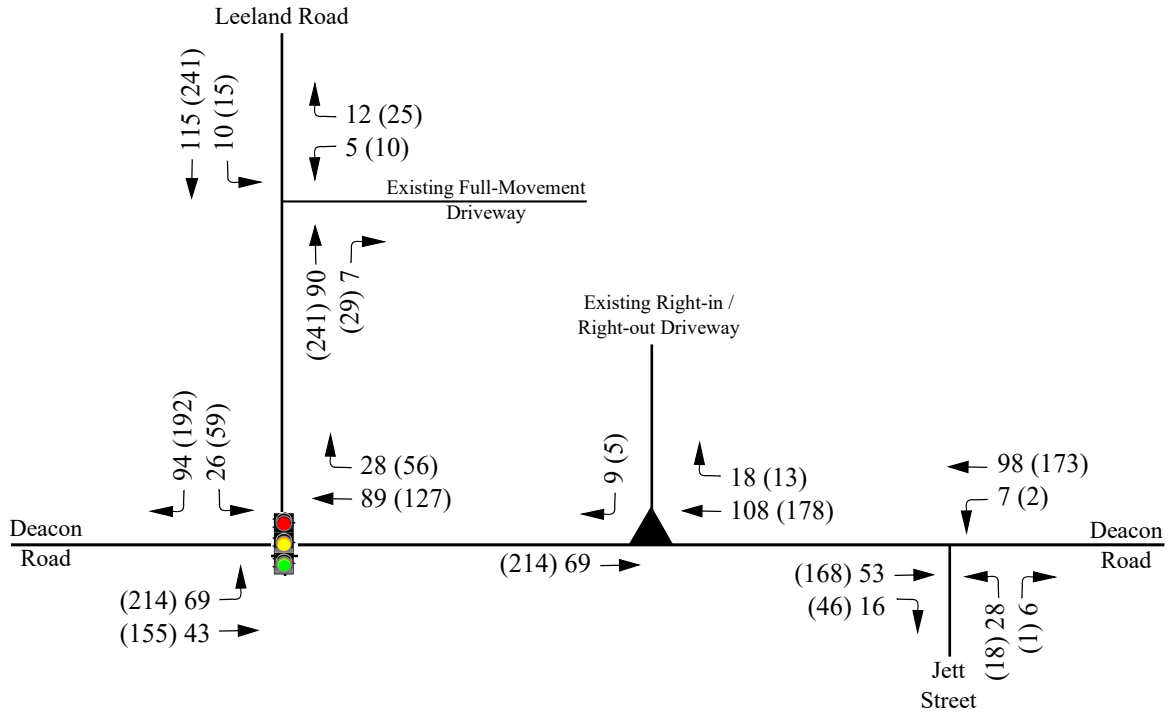
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Figure 1

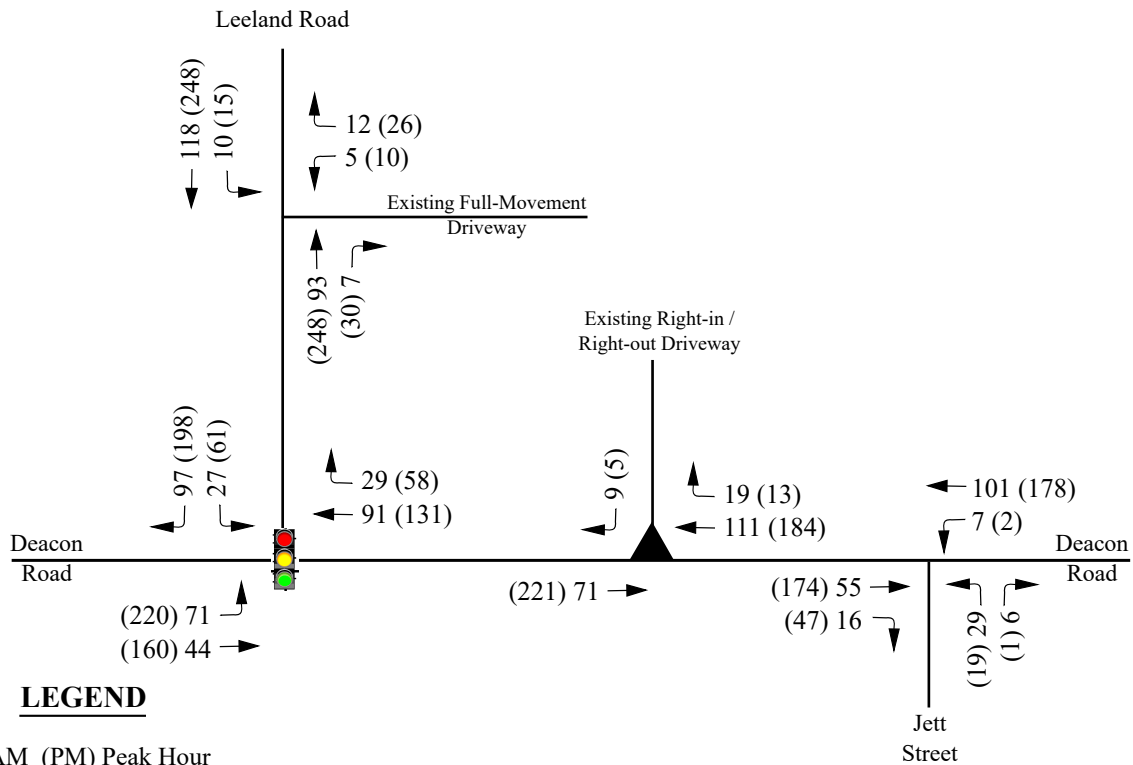




### Existing (2019) Traffic Volumes



### No-Build (2020) Traffic Volumes



7-Eleven  
Deacon Road  
Stafford County, Virginia

Existing (2019) and  
No-Build (2020)  
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 3

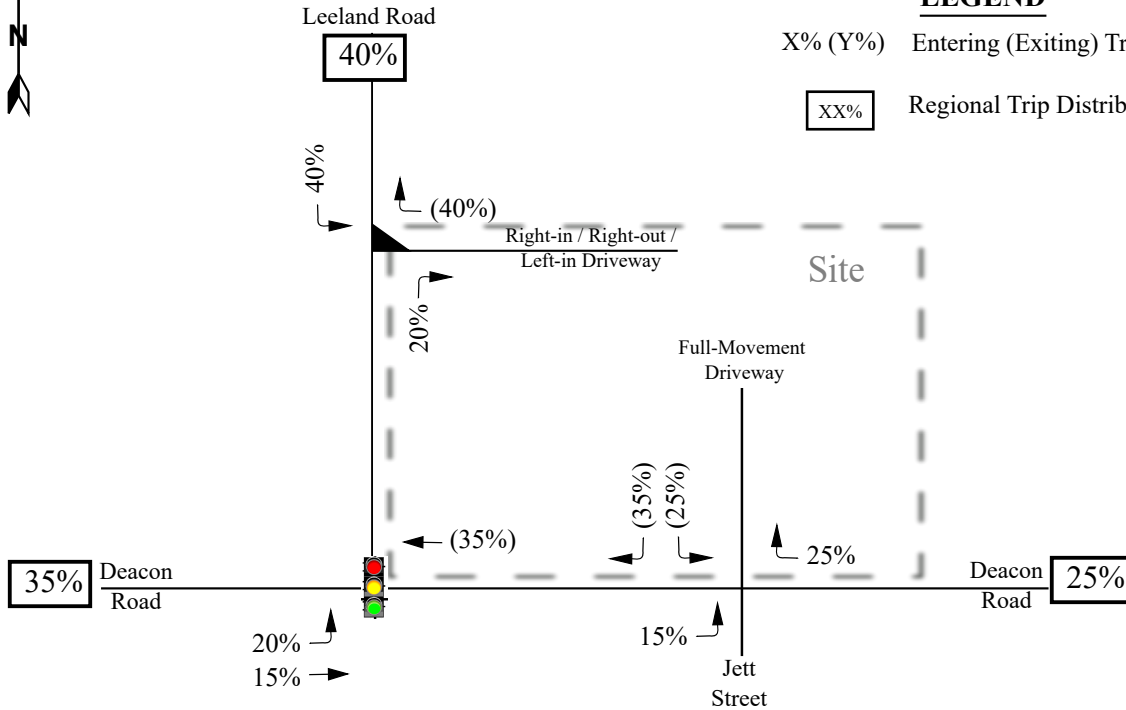


### Primary Site Trip Distribution

#### LEGEND

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

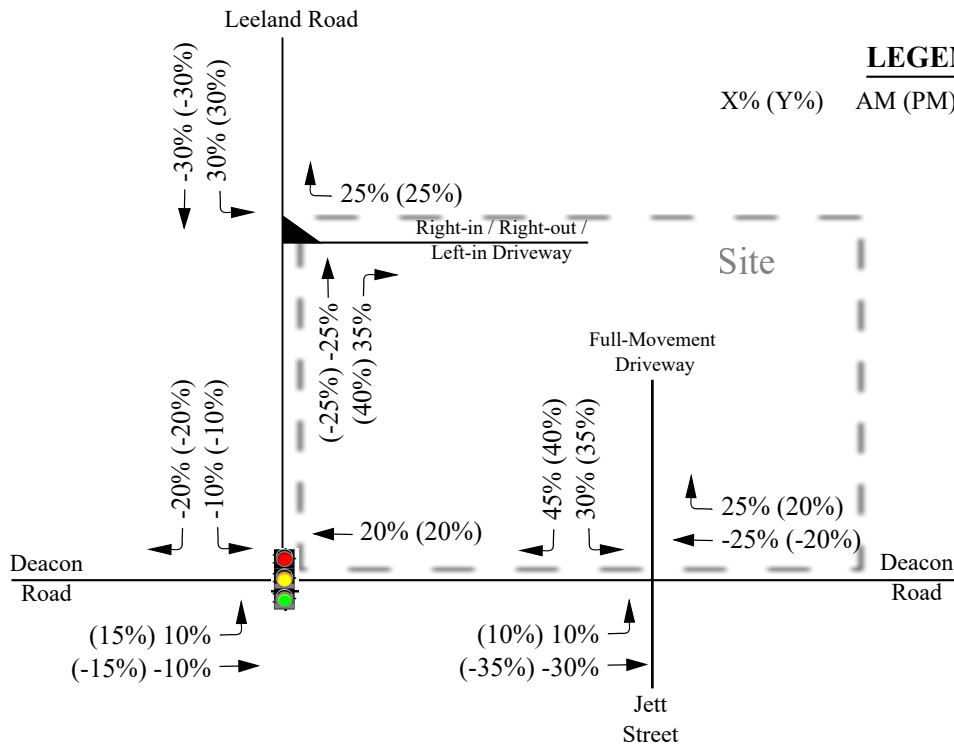
XX% Regional Trip Distribution



### Pass-By Site Trip Distribution

#### LEGEND

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



7-Eleven  
Deacon Road  
Stafford County, Virginia

Primary and Pass-By  
Site Trip Distribution

Scale: Not to Scale

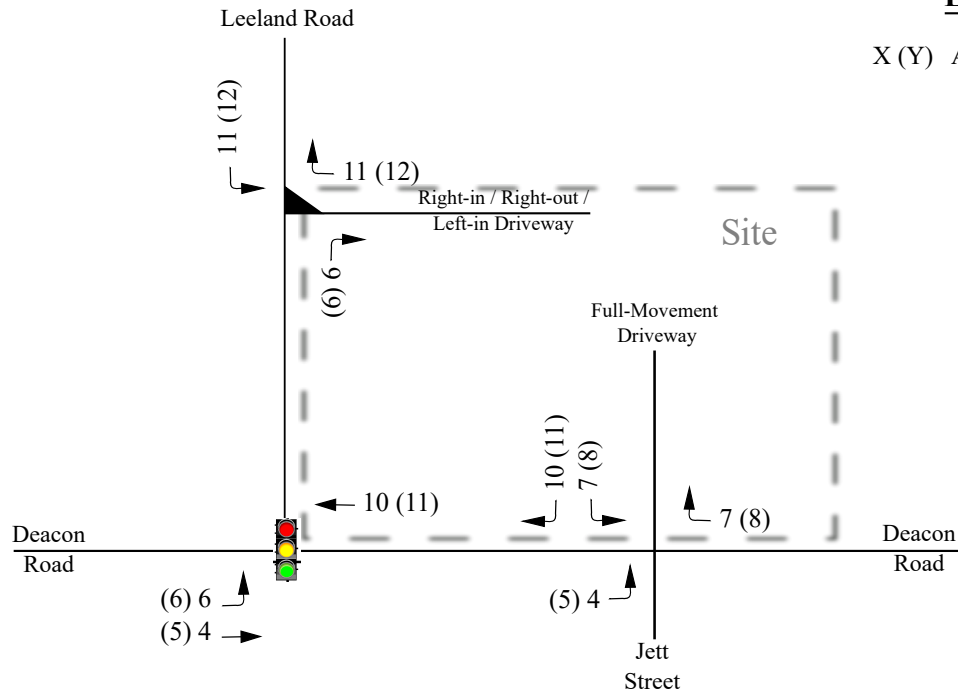
Figure 4



### Primary Site Trip Assignment

### LEGEND

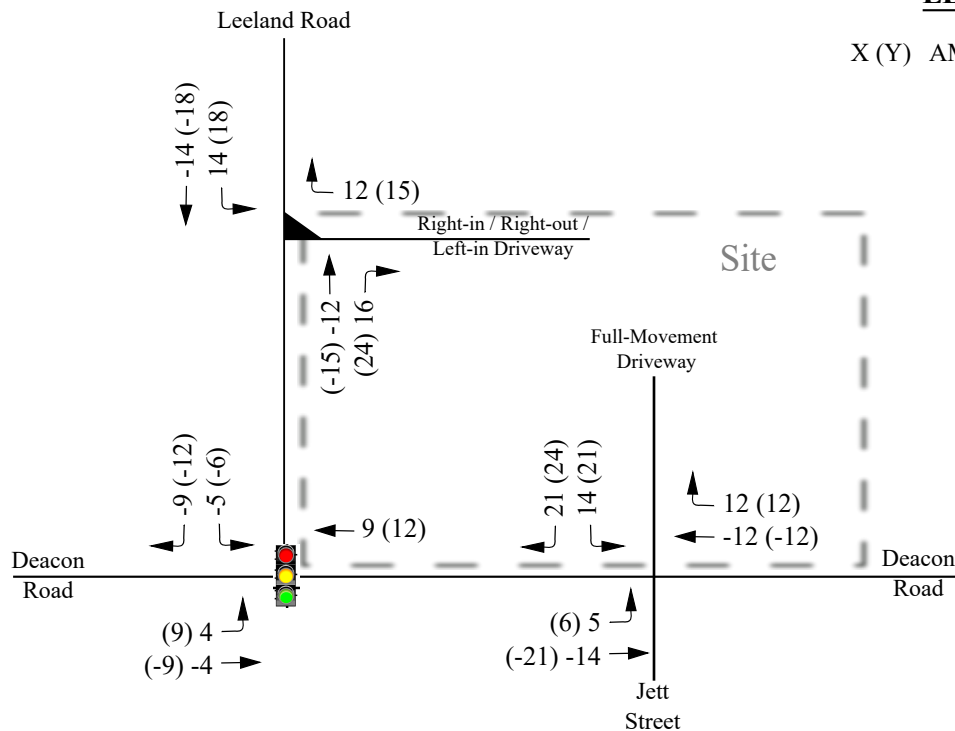
X (Y) AM (PM) Peak Hour



### Pass-By Site Trip Assignment

### LEGEND

X (Y) AM (PM) Peak Hour

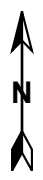


7-Eleven  
Deacon Road  
Stafford County, Virginia

Primary and Pass-By  
Site Trip Assignment

Scale: Not to Scale

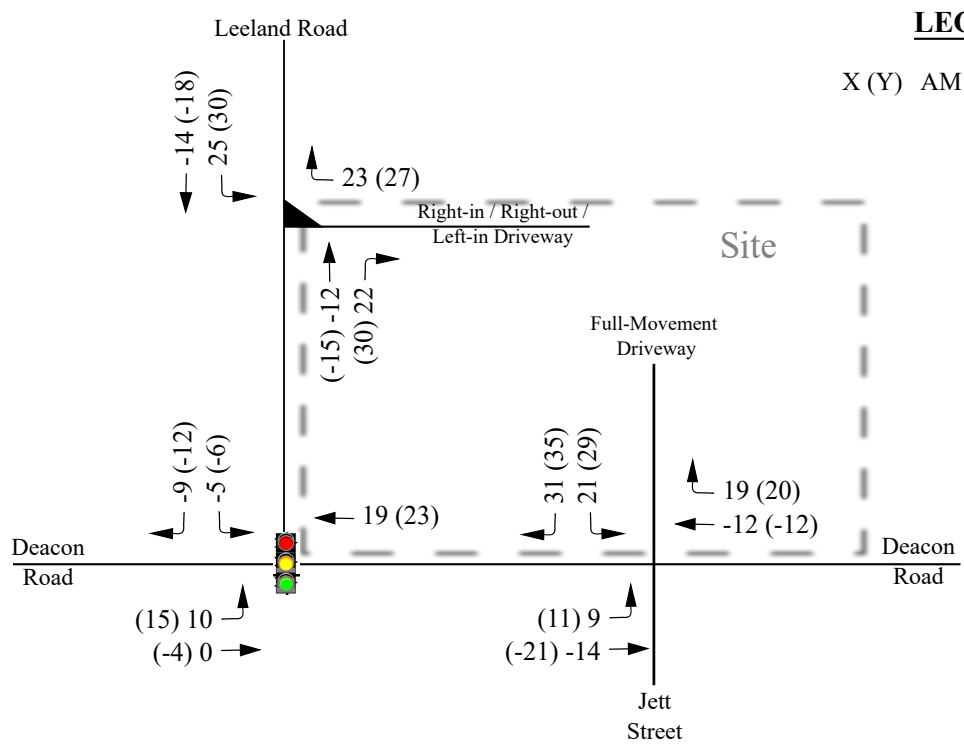
Figure 5



### Total Site Trips

### LEGEND

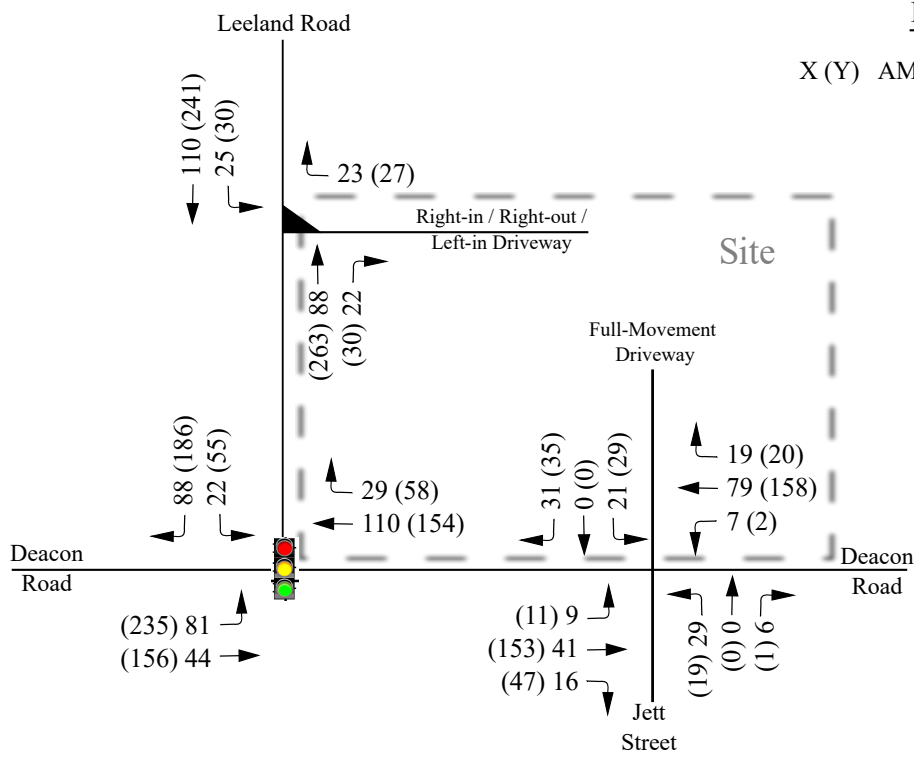
X (Y) AM (PM) Peak Hour



### Build (2020) Traffic Volumes

### LEGEND

X (Y) AM (PM) Peak Hour



7-Eleven  
Deacon Road  
Stafford County, Virginia

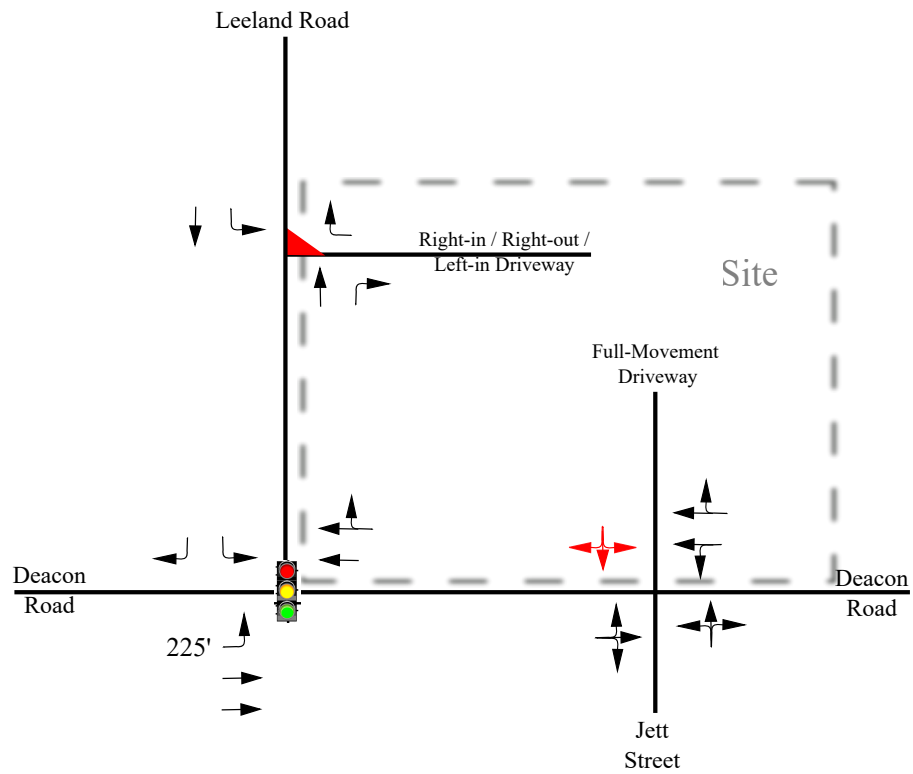
Total Site Trips and  
Build (2020) Peak Hour  
Traffic Volumes

Scale: Not to Scale

Figure 6



### Recommended Lanes



### LEGEND

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



7-Eleven  
Deacon Road  
Stafford County, Virginia

Recommended Lane  
Configuration

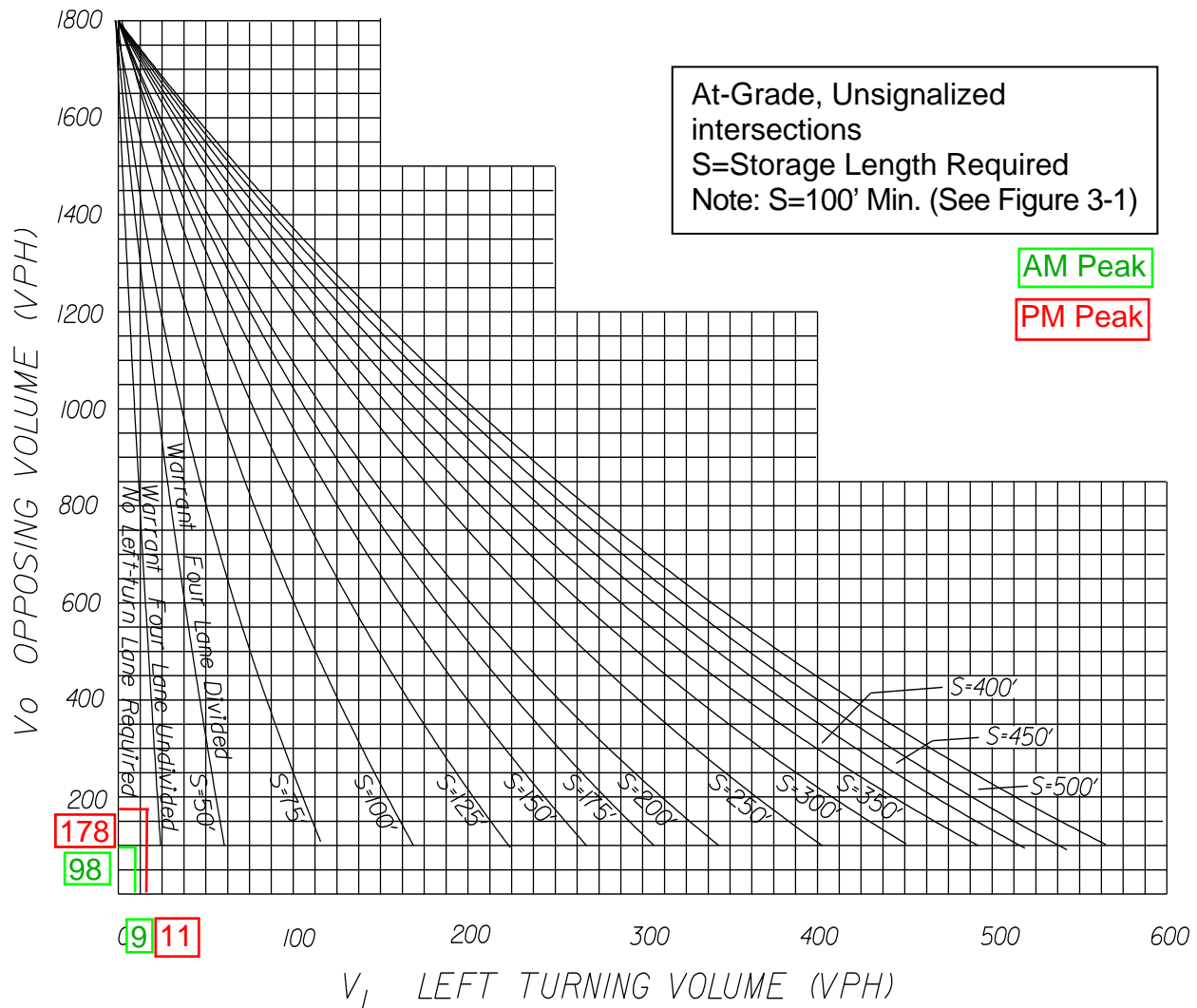
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Figure 7



Deacon Road at Jett Street / Full-movement Driveway  
Build (2020) Volumes  
Eastbound Left-Turn Lane Warrant

Warrants for L



**FIGURE 3-3 WARRANTS FOR LEFT TURN STORAGE LANES ON FOUR-LANE HIGHWAYS**

Figure 3-3 was derived from Highway Research Report No. 211.

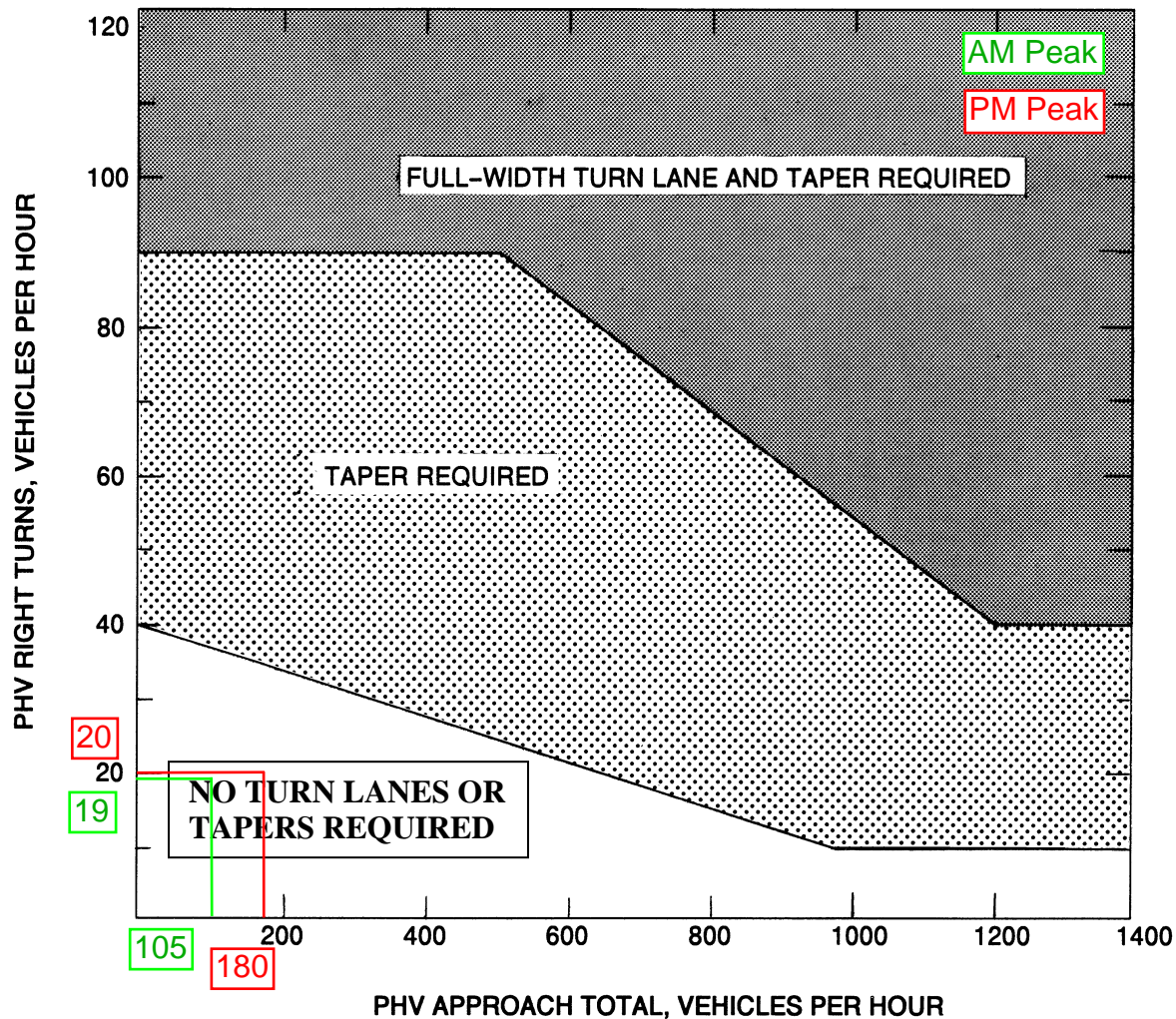
Opposing volume and left turning volume in vehicles per hour (VPH) are used for left turn storage lane warrants on four-lane highways.

For plan detail requirements when curb and/or gutter are used, see VDOT's Road Design Manual, [Section 2E-3](#) on the VDOT web site:

<http://www.virginiadot.org/business/locdes/rdmanual-index.asp>.

Deacon Road at Jett Street / Full-movement Driveway  
Build (2020) Volumes  
Westbound Right-Turn Lane Warrant

F-81



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

### LEGEND

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

#### Adjustment for Right Turns

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

K = the percent of AADT occurring in the peak hour

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

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

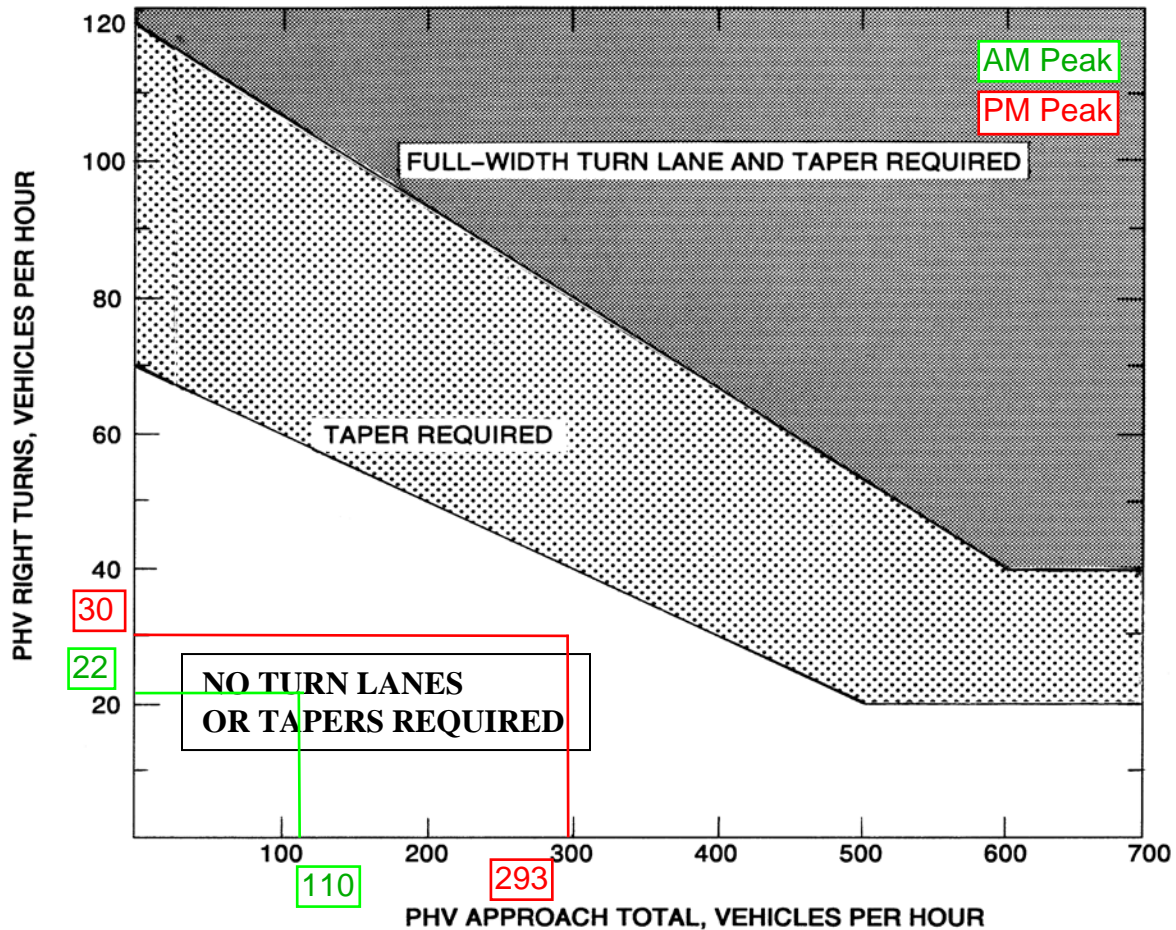
When right turn facilities are warranted, see Figure 3-1 for design criteria.\*

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

\* Rev. 1/15

Leeland Road at Partial Access Driveway  
Build (2020) Volumes  
Northbound Right-Turn Lane Warrant

F-80



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

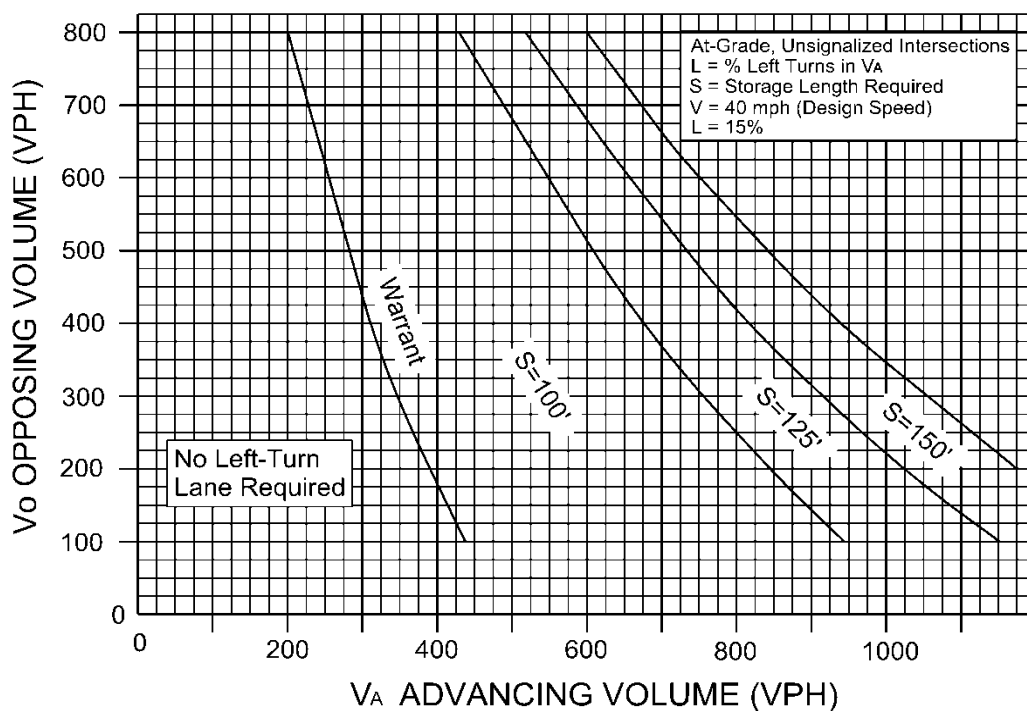
Note: An average of 11% for K x D will suffice.

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

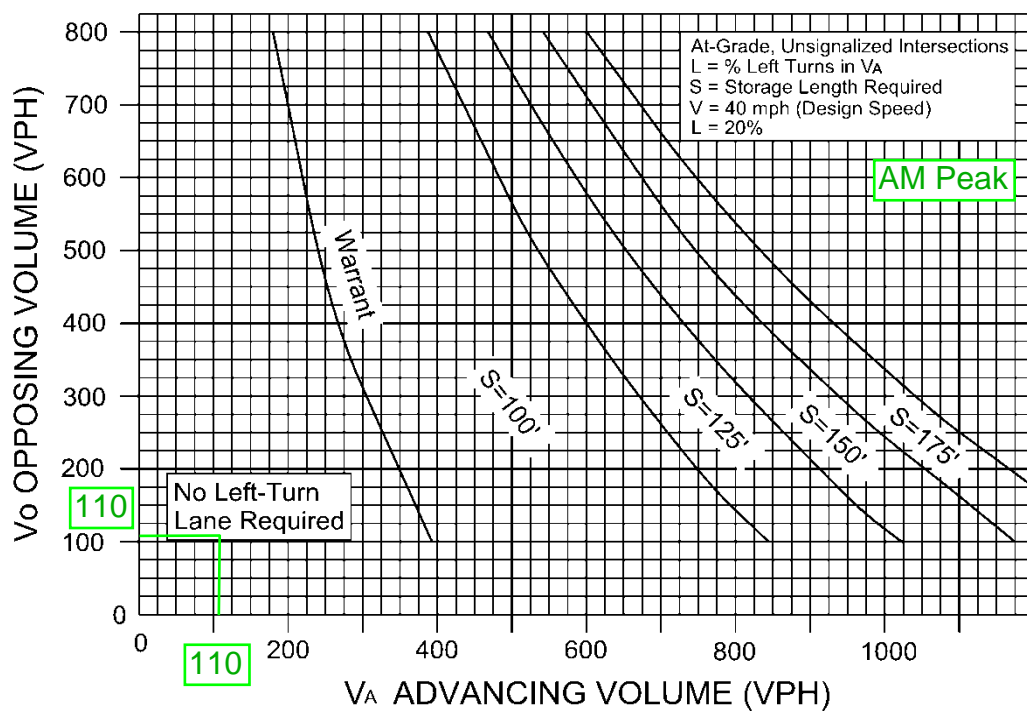
**FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)**

Leeland Road at Partial Access Driveway  
Build (2020) Volumes  
Southbound Left-Turn Lane Warrant

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



**FIGURE 3-7**

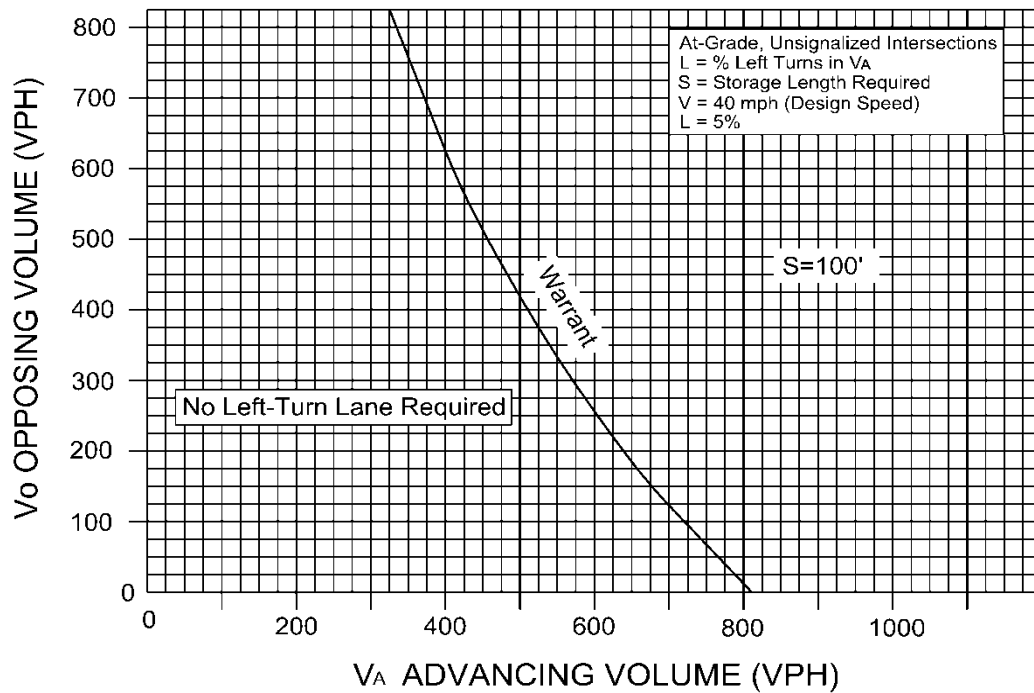


**FIGURE 3-8**

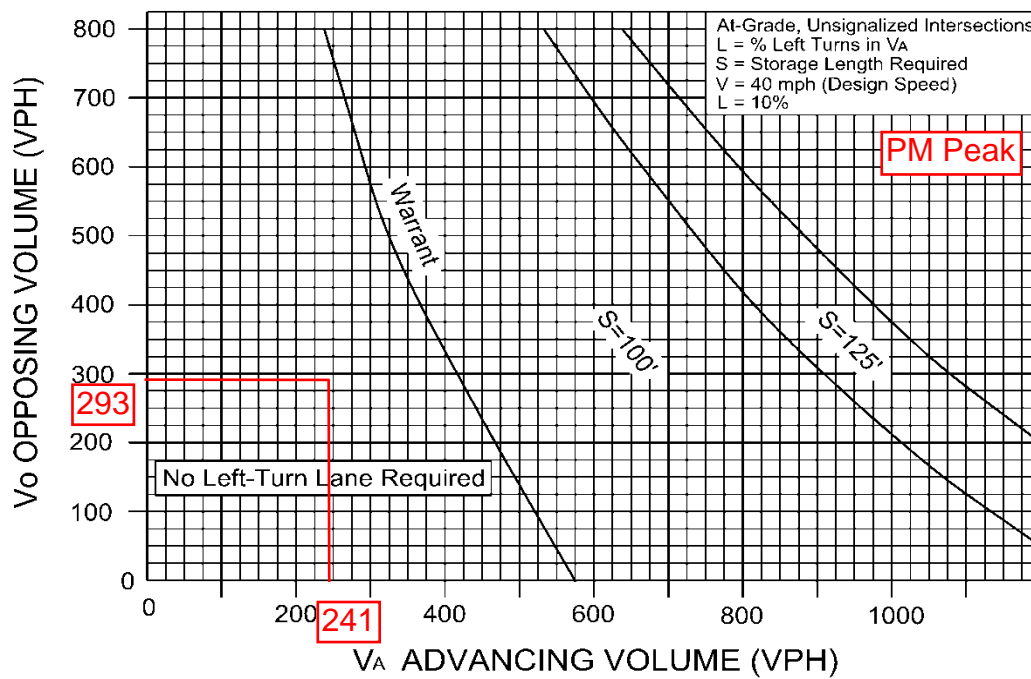


Leeland Road at Partial Access Driveway  
Build (2020) Volumes  
Southbound Left-Turn Lane Warrant

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



**FIGURE 3-5**



**FIGURE 3-6**



File Name : Fredericksburg(Leeland and Deacon)AM Peak

Site Code :

Start Date : 2/20/2019

Page No : 1

Groups Printed- Cars + - Trucks

	Leeland Road Southbound			Deacon Road Westbound			Deacon Road Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
07:00 AM	19	3	22	6	16	22	8	13	21	65
07:15 AM	16	5	21	7	19	26	4	14	18	65
07:30 AM	19	3	22	8	18	26	14	21	35	83
07:45 AM	14	4	18	7	19	26	2	12	14	58
Total	68	15	83	28	72	100	28	60	88	271
08:00 AM	24	9	33	5	24	29	6	18	24	86
08:15 AM	24	6	30	8	24	32	10	21	31	93
08:30 AM	18	6	24	9	12	21	11	15	26	71
08:45 AM	28	5	33	6	29	35	16	15	31	99
Total	94	26	120	28	89	117	43	69	112	349
Grand Total	162	41	203	56	161	217	71	129	200	620
Apprch %	79.8	20.2		25.8	74.2		35.5	64.5		
Total %	26.1	6.6	32.7	9	26	35	11.5	20.8	32.3	
Cars +	162	41	203	55	161	216	70	128	198	617
% Cars +	100	100	100	98.2	100	99.5	98.6	99.2	99	99.5
Trucks	0	0	0	1	0	1	1	1	2	3
% Trucks	0	0	0	1.8	0	0.5	1.4	0.8	1	0.5



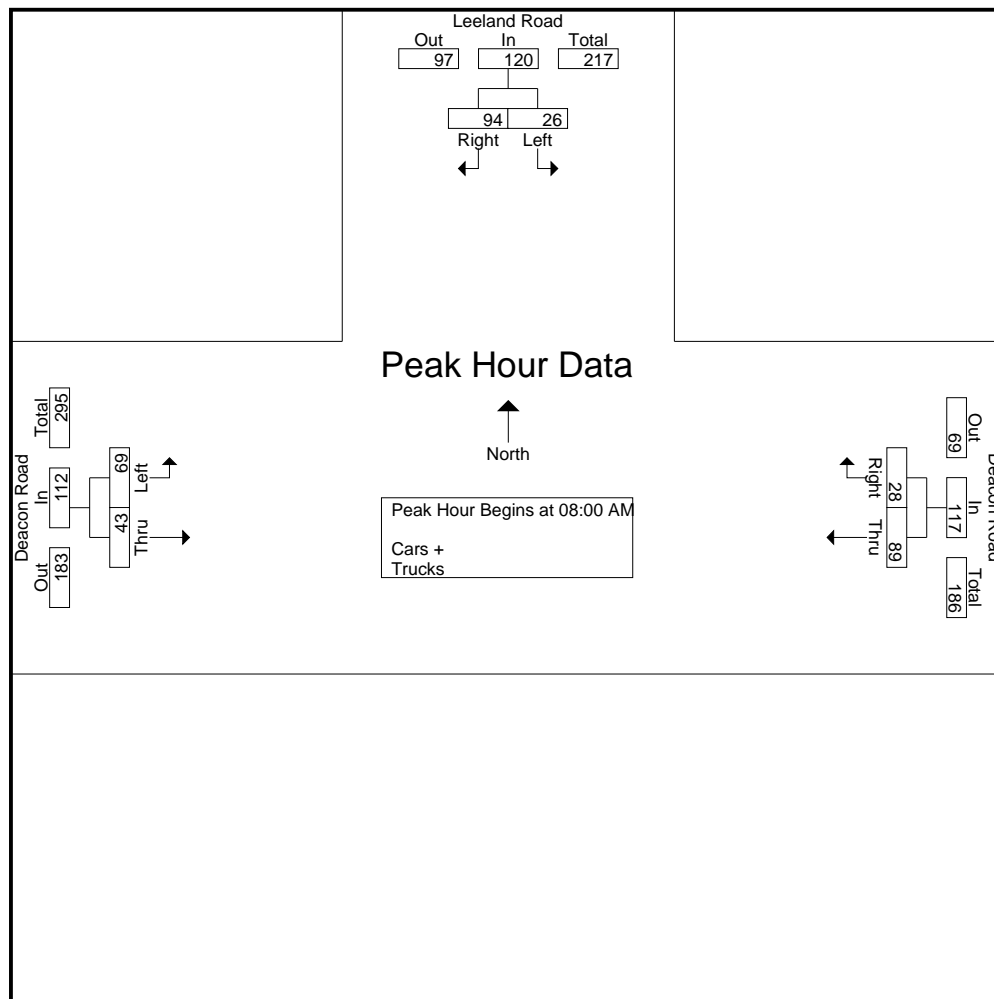
File Name : Fredericksburg(Leeland and Deacon)AM Peak

Site Code :

Start Date : 2/20/2019

Page No : 2

	Leeland Road Southbound			Deacon Road Westbound			Deacon Road Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	24	9	33	5	24	29	6	18	24	86
08:15 AM	24	6	30	8	24	32	10	21	31	93
08:30 AM	18	6	24	9	12	21	11	15	26	71
08:45 AM	28	5	33	6	29	35	16	15	31	99
Total Volume	94	26	120	28	89	117	43	69	112	349
% App. Total	78.3	21.7		23.9	76.1		38.4	61.6		
PHF	.839	.722	.909	.778	.767	.836	.672	.821	.903	.881





File Name : Fredericksburg(Leeland and Deacon)PM Peak

Site Code :

Start Date : 2/20/2019

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Groups Printed- Cars + - Trucks

	Leeland Road Southbound			Deacon Road Westbound			Deacon Road Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
04:00 PM	50	17	67	8	23	31	31	44	75	173
04:15 PM	52	14	66	10	30	40	32	38	70	176
04:30 PM	52	15	67	15	29	44	24	51	75	186
04:45 PM	48	18	66	13	27	40	29	41	70	176
Total	202	64	266	46	109	155	116	174	290	711
05:00 PM	37	20	57	20	32	52	36	45	81	190
05:15 PM	47	14	61	12	24	36	35	54	89	186
05:30 PM	54	12	66	10	35	45	37	59	96	207
05:45 PM	54	13	67	14	36	50	47	56	103	220
Total	192	59	251	56	127	183	155	214	369	803
Grand Total	394	123	517	102	236	338	271	388	659	1514
Apprch %	76.2	23.8		30.2	69.8		41.1	58.9		
Total %	26	8.1	34.1	6.7	15.6	22.3	17.9	25.6	43.5	
Cars +	393	123	516	102	236	338	271	388	659	1513
% Cars +	99.7	100	99.8	100	100	100	100	100	100	99.9
Trucks	1	0	1	0	0	0	0	0	0	1
% Trucks	0.3	0	0.2	0	0	0	0	0	0	0.1





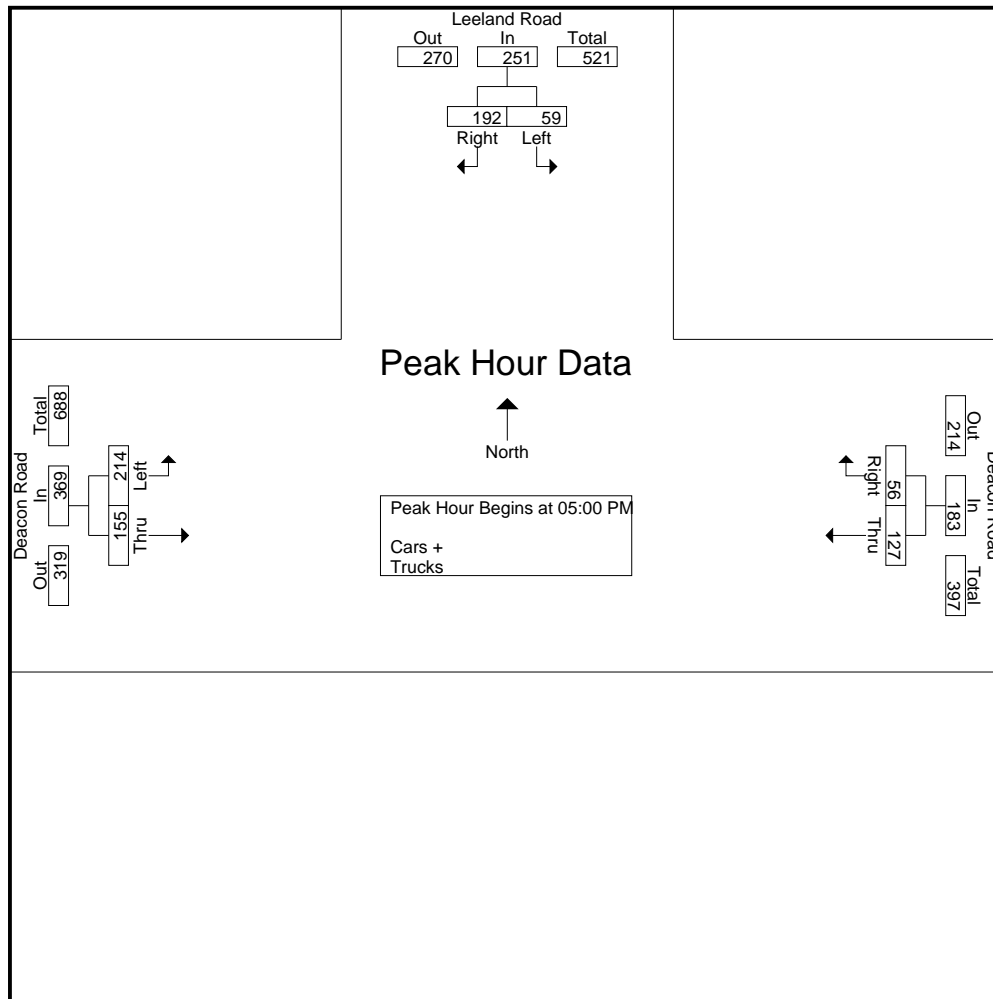
File Name : Fredericksburg(Leeland and Deacon)PM Peak

Site Code :

Start Date : 2/20/2019

Page No : 2

	Leeland Road Southbound			Deacon Road Westbound			Deacon Road Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	37	20	57	20	32	52	36	45	81	190
05:15 PM	47	14	61	12	24	36	35	54	89	186
05:30 PM	54	12	66	10	35	45	37	59	96	207
05:45 PM	54	13	67	14	36	50	47	56	103	220
Total Volume	192	59	251	56	127	183	155	214	369	803
% App. Total	76.5	23.5		30.6	69.4		42	58		
PHF	.889	.738	.937	.700	.882	.880	.824	.907	.896	.913



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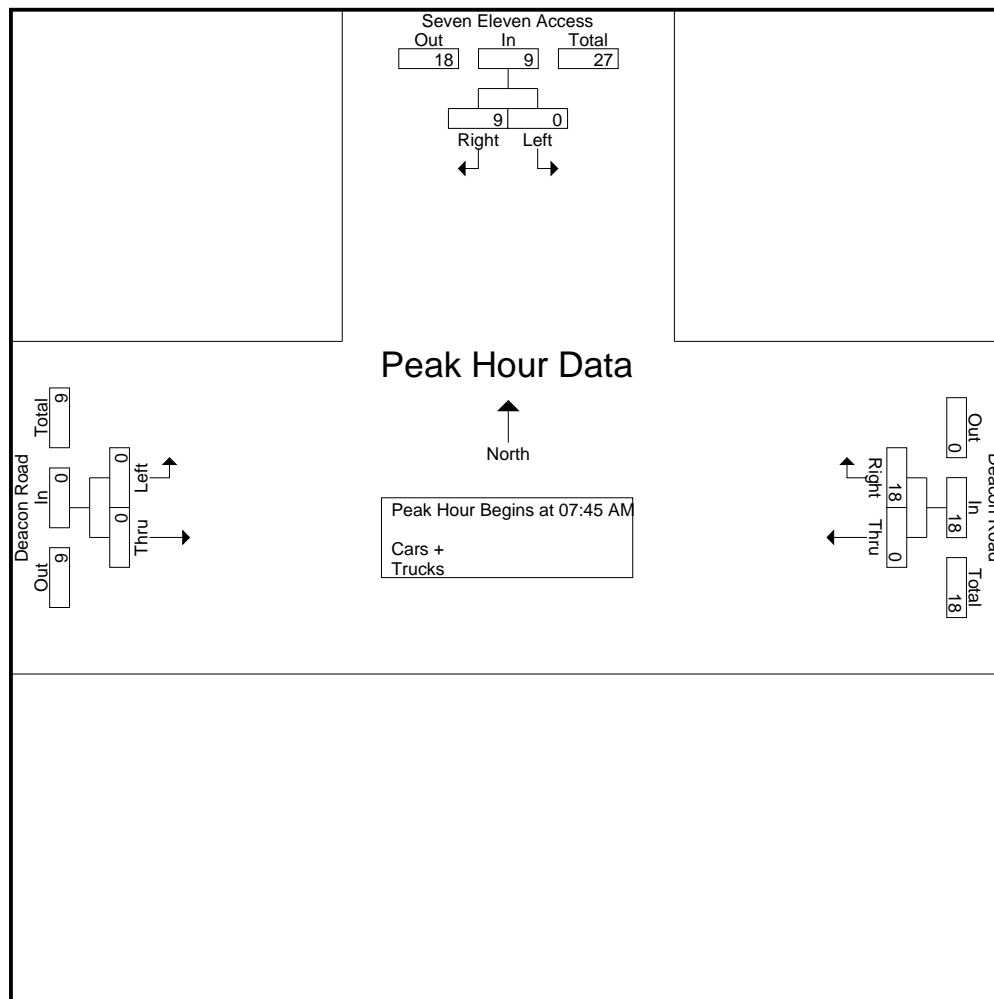
File Name : Fredericksburg( Deacon and 7 Eleven Access)AM Peak

Site Code :

Start Date : 2/20/2019

Page No : 2

	Seven Eleven Access Southbound			Deacon Road Westbound			Deacon Road Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	3	0	3	8	0	8	0	0	0	11
08:00 AM	2	0	2	2	0	2	0	0	0	4
08:15 AM	3	0	3	4	0	4	0	0	0	7
08:30 AM	1	0	1	4	0	4	0	0	0	5
Total Volume	9	0	9	18	0	18	0	0	0	27
% App. Total	100	0		100	0		0	0		
PHF	.750	.000	.750	.563	.000	.563	.000	.000	.000	.614



[illegible]



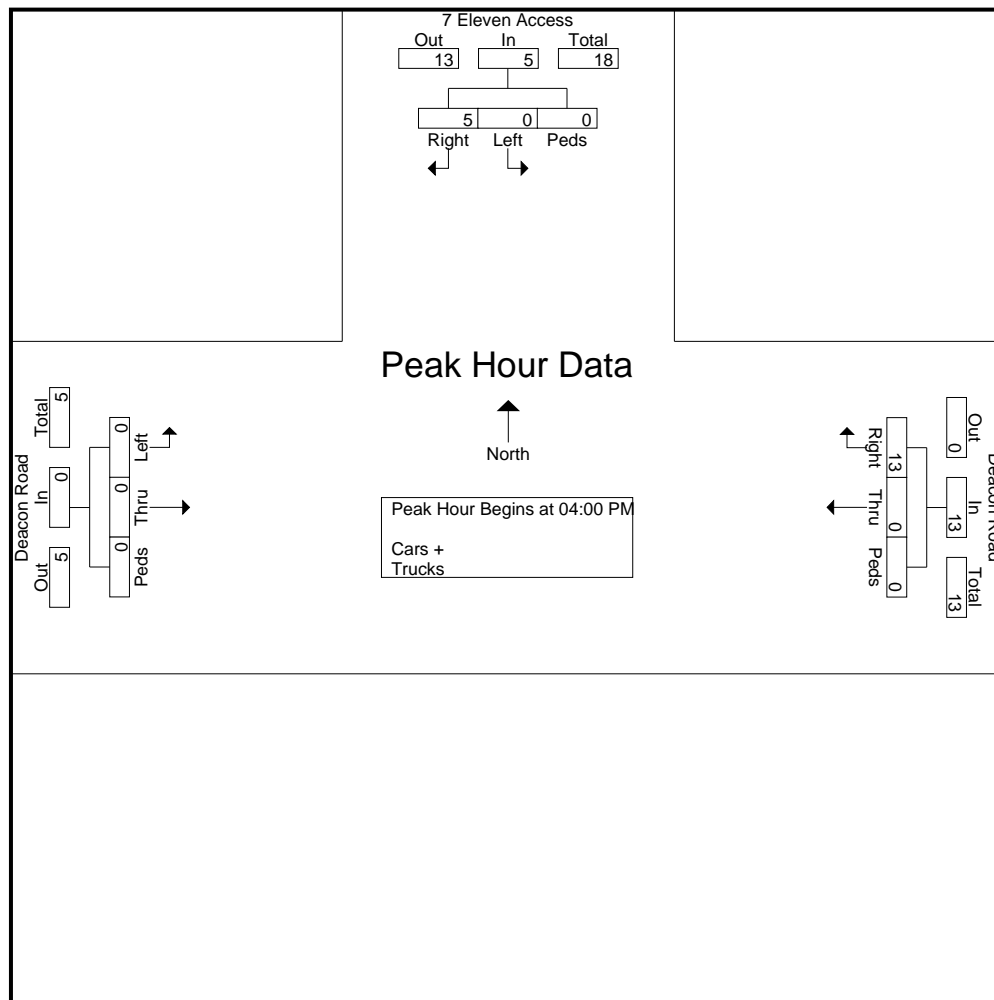
File Name : Fredericksburg( Deacon and 7 Eleven Access)PM Peak

Site Code :

Start Date : 2/20/2019

Page No : 2

	7 Eleven Access Southbound				Deacon Road Westbound				Deacon Road Eastbound				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	4	0	0	4	0	0	0	0	4
04:15 PM	3	0	0	3	5	0	0	5	0	0	0	0	8
04:30 PM	1	0	0	1	2	0	0	2	0	0	0	0	3
04:45 PM	1	0	0	1	2	0	0	2	0	0	0	0	3
Total Volume	5	0	0	5	13	0	0	13	0	0	0	0	18
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.417	.000	.000	.417	.650	.000	.000	.650	.000	.000	.000	.000	.563





File Name : Fredericksburg(Leeland and 7 Eleven Access)AM Peak

Site Code :

Start Date : 2/20/2019

Page No : 1

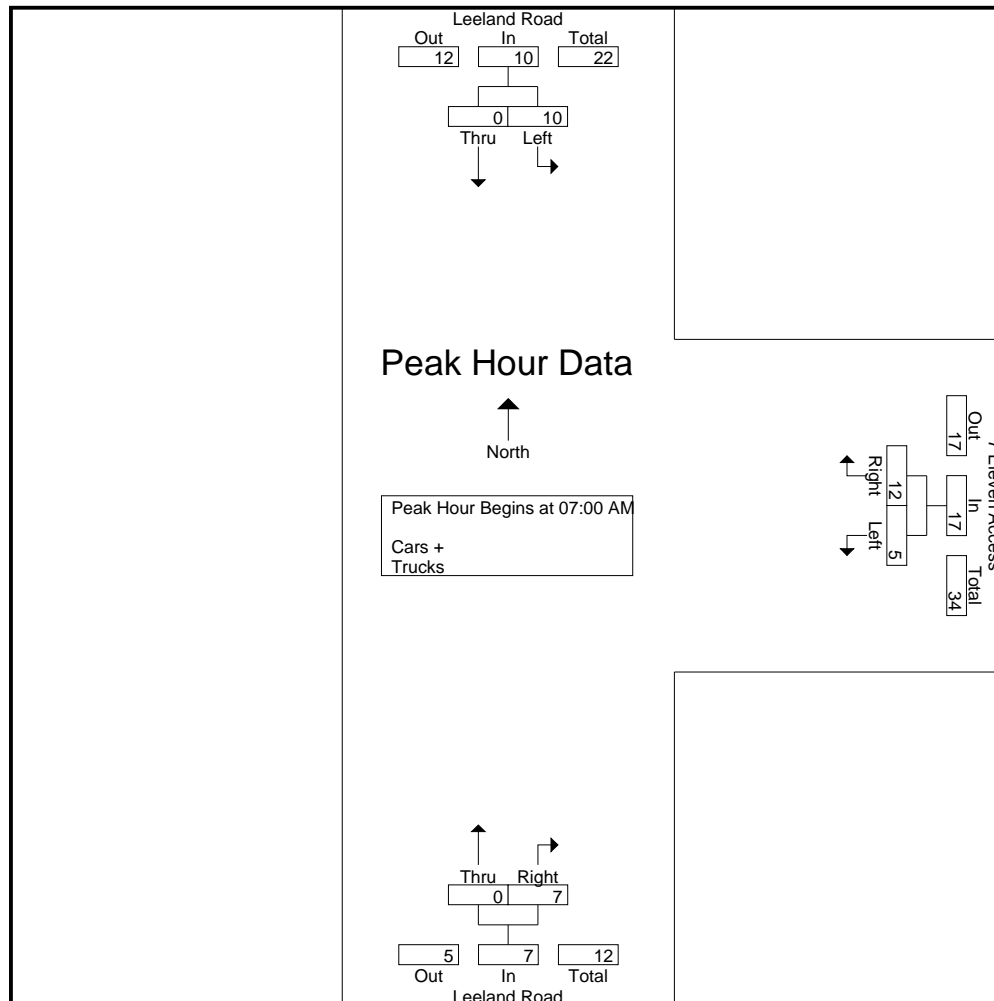
Groups Printed- Cars + - Trucks

	Leeland Road Southbound			7 Eleven Access Westbound			Leeland Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
07:00 AM	0	2	2	3	0	3	2	0	2	7
07:15 AM	0	3	3	2	2	4	1	0	1	8
07:30 AM	0	2	2	3	1	4	2	0	2	8
07:45 AM	0	3	3	4	2	6	2	0	2	11
Total	0	10	10	12	5	17	7	0	7	34
08:00 AM	0	1	1	4	2	6	0	0	0	7
08:15 AM	0	4	4	0	2	2	2	0	2	8
08:30 AM	0	0	0	2	2	4	0	0	0	4
08:45 AM	0	2	2	2	3	5	2	0	2	9
Total	0	7	7	8	9	17	4	0	4	28
Grand Total	0	17	17	20	14	34	11	0	11	62
Apprch %	0	100		58.8	41.2		100	0		
Total %	0	27.4	27.4	32.3	22.6	54.8	17.7	0	17.7	
Cars +	0	17	17	16	14	30	10	0	10	57
% Cars +	0	100	100	80	100	88.2	90.9	0	90.9	91.9
Trucks	0	0	0	4	0	4	1	0	1	5
% Trucks	0	0	0	20	0	11.8	9.1	0	9.1	8.1



File Name : Fredericksburg(Leeland and 7 Eleven Access)AM Peak  
 Site Code :  
 Start Date : 2/20/2019  
 Page No : 2

	Leeland Road Southbound			7 Eleven Access Westbound			Leeland Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	2	2	3	0	3	2	0	2	7
07:15 AM	0	3	3	2	2	4	1	0	1	8
07:30 AM	0	2	2	3	1	4	2	0	2	8
07:45 AM	0	3	3	4	2	6	2	0	2	11
Total Volume	0	10	10	12	5	17	7	0	7	34
% App. Total	0	100		70.6	29.4		100	0		
PHF	.000	.833	.833	.750	.625	.708	.875	.000	.875	.773



[illegible]





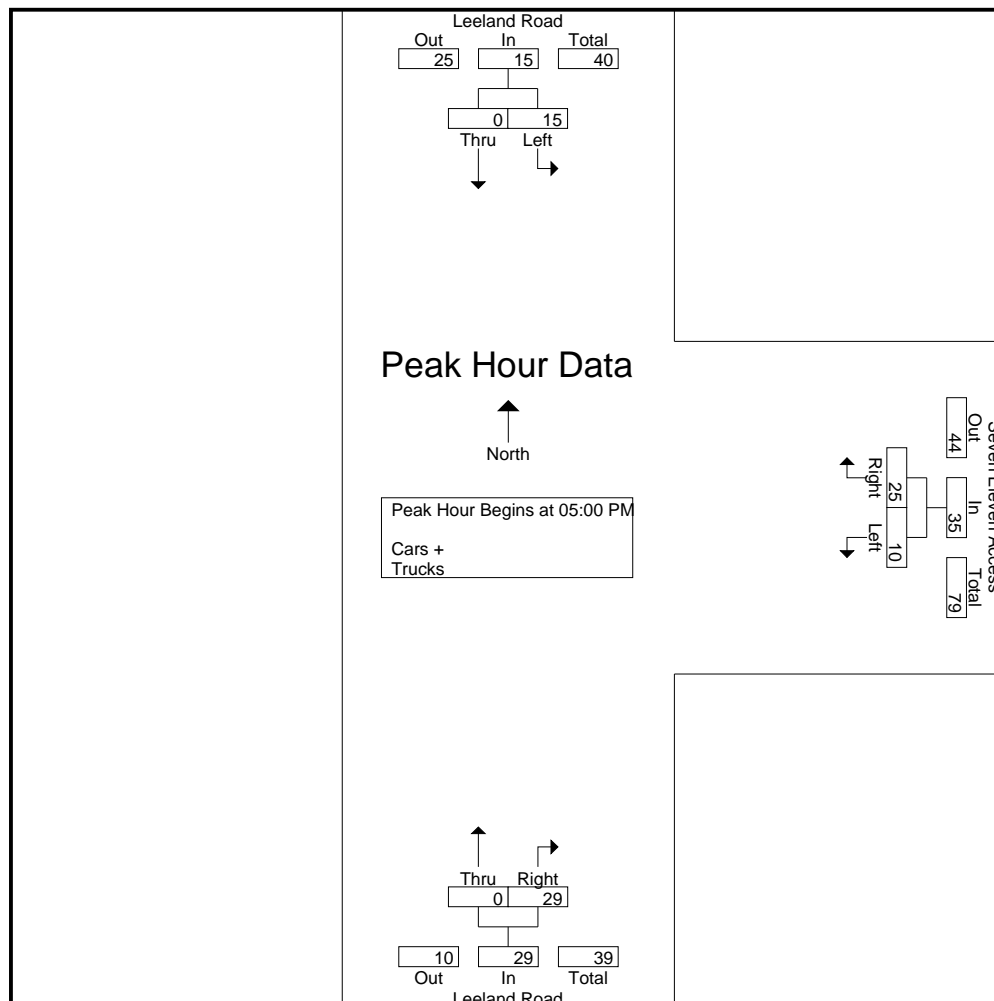
File Name : Fredericksburg(Leeland and 7 Eleven Access)PM Peak

Site Code :

Start Date : 2/20/2019

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	Leeland Road Southbound			Seven Eleven Access Westbound			Leeland Road Northbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	3	3	3	1	4	2	0	2	9
05:15 PM	0	4	4	7	3	10	9	0	9	23
05:30 PM	0	4	4	7	3	10	8	0	8	22
05:45 PM	0	4	4	8	3	11	10	0	10	25
Total Volume	0	15	15	25	10	35	29	0	29	79
% App. Total	0	100		71.4	28.6		100	0		
PHF	.000	.938	.938	.781	.833	.795	.725	.000	.725	.790



**AM Peak Hour**

**Intersection:** Deacon Rd. and  
Jett St.

**County:** Stafford

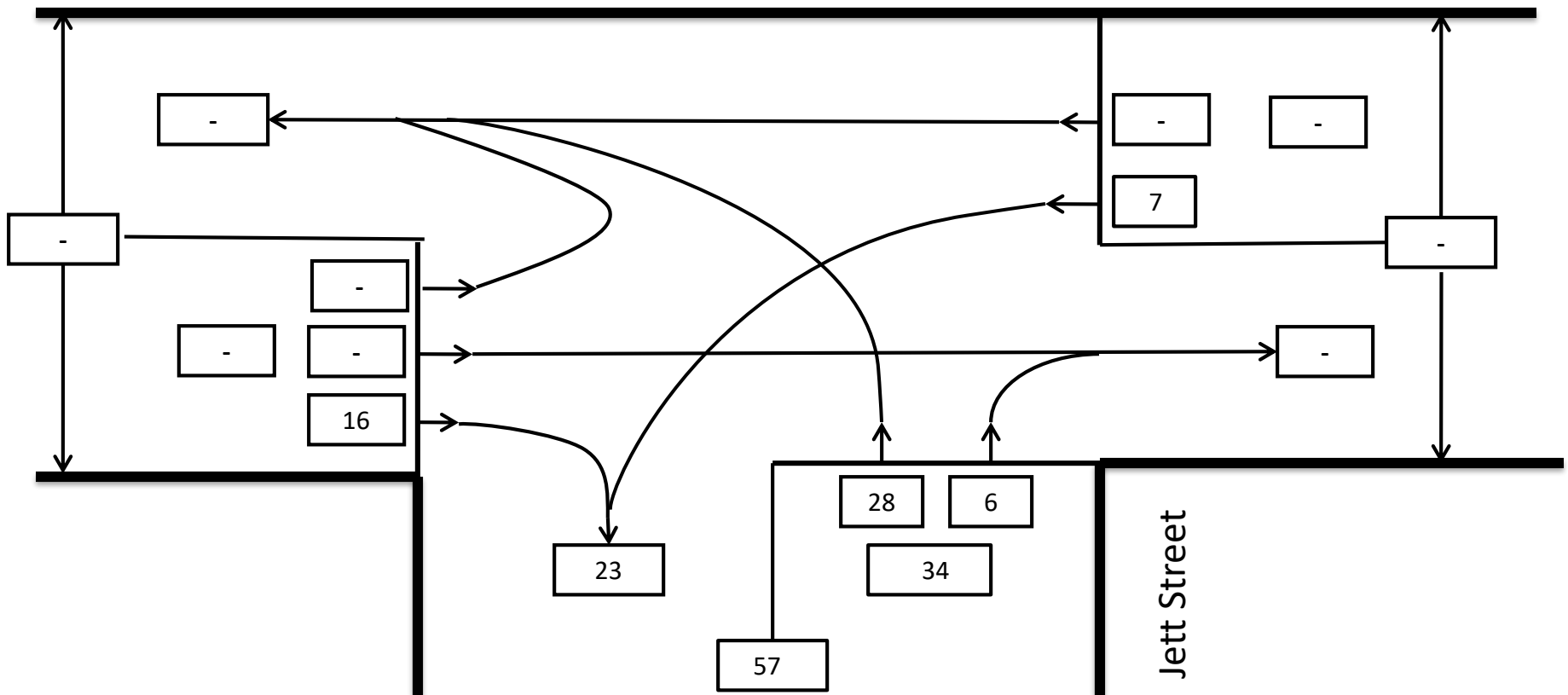
**Date:** August 13, 2019

**Time:** 7:15 AM – 8:15 AM

N



Deacon Rd.



## PM Peak Hour

**Intersection:** Deacon Rd. and Jett St.

**County:** Stafford

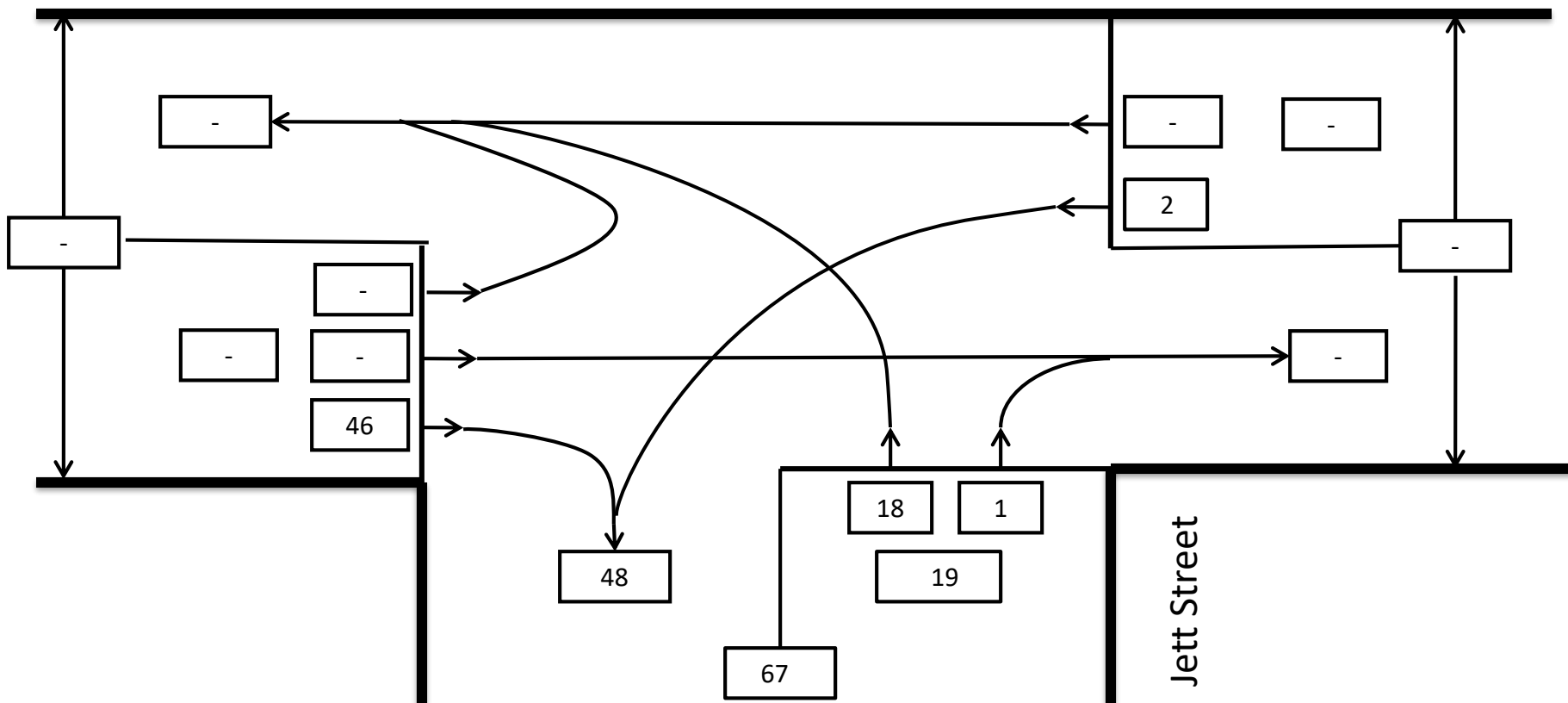
**Date:** August 13, 2019

**Time:** 4:30 PM – 5:30 PM

N



Deacon Rd.
















Jett Street

# 7-Eleven - Deacon Road - Stafford County, VA

# Existing (2019) Conditions







## 1: Deacon Road & Leeland Road

Timing Plan: AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Traffic Volume (vph)	69	43	89	28	26	94
Future Volume (vph)	69	43	89	28	26	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3412	0	1770	1583
Flt Permitted	0.408				0.950	
Satd. Flow (perm)	760	3539	3412	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			32			107
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	220		167	
Travel Time (s)		10.9	3.3		3.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	49	133	0	30	107
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	20.0	70.0	50.0		30.0	20.0
Total Split (%)	20.0%	70.0%	50.0%		30.0%	20.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	22.1	28.3	12.6		6.3	8.3
Actuated g/C Ratio	0.70	0.90	0.40		0.20	0.26
v/c Ratio	0.11	0.02	0.10		0.08	0.22
Control Delay	3.3	2.6	9.4		12.9	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.3	2.6	9.4		12.9	3.1
LOS	A	A	A		B	A
Approach Delay		3.0	9.4		5.3	
Approach LOS		A	A		A	
Queue Length 50th (ft)	1	0	5		3	0
Queue Length 95th (ft)	22	7	27		22	15
Internal Link Dist (ft)		642	140		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	968	3539	3387		1339	833
Starvation Cap Reductn	0	0	0		0	0

## 1: Deacon Road &amp; Leeland Road

Timing Plan: AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.08	0.01	0.04		0.02	0.13

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 31.4

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.22

Intersection Signal Delay: 5.9

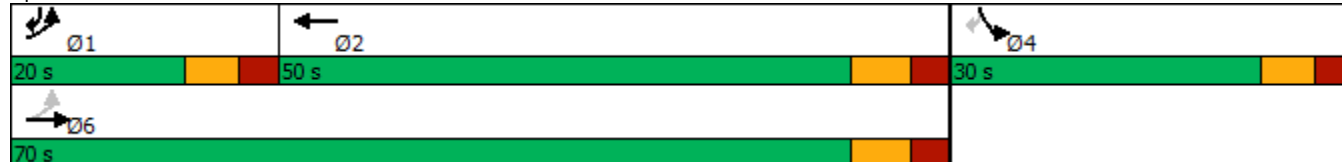
Intersection Capacity Utilization 26.7%

Analysis Period (min) 15

Intersection LOS: A








ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road



7-Eleven - Deacon Road - Stafford County, VA  
2: Jett Street & Deacon Road

Existing (2019) Conditions  
Timing Plan: AM Peak Hour














Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				 	 	
Traffic Vol, veh/h	53	16	7	98	28	6
Future Vol, veh/h	53	16	7	98	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	18	8	111	32	7
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	78	0	132	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	72	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1519	-	855	1005
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1519	-	851	1005
Mov Cap-2 Maneuver	-	-	-	-	851	-
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	938	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		9.3	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	875	-	-	1519	-	
HCM Lane V/C Ratio	0.044	-	-	0.005	-	
HCM Control Delay (s)	9.3	-	-	7.4	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

# 7-Eleven - Deacon Road - Stafford County, VA

# Existing (2019) Conditions







## 1: Deacon Road & Leeland Road

Timing Plan: PM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Traffic Volume (vph)	214	155	127	56	59	192
Future Volume (vph)	214	155	127	56	59	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3376	0	1770	1583
Flt Permitted	0.339				0.950	
Satd. Flow (perm)	631	3539	3376	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			62			211
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	224		167	
Travel Time (s)		10.9	3.4		3.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)						
Lane Group Flow (vph)	235	170	202	0	65	211
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	20.0	70.0	50.0		30.0	20.0
Total Split (%)	20.0%	70.0%	50.0%		30.0%	20.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effect Green (s)	25.0	28.8	7.7		7.4	16.6
Actuated g/C Ratio	0.62	0.72	0.19		0.18	0.42
v/c Ratio	0.36	0.07	0.29		0.20	0.27
Control Delay	6.8	4.9	13.4		19.0	2.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	6.8	4.9	13.4		19.0	2.1
LOS	A	A	B		B	A
Approach Delay		6.0	13.4		6.1	
Approach LOS		A	B		A	
Queue Length 50th (ft)	29	10	16		15	0
Queue Length 95th (ft)	61	22	44		45	22
Internal Link Dist (ft)		642	144		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	794	3539	3140		1102	949
Starvation Cap Reductn	0	0	0		0	0

## 1: Deacon Road &amp; Leeland Road

Timing Plan: PM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.30	0.05	0.06		0.06	0.22

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 40

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 7.7

Intersection Capacity Utilization 39.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road





7-Eleven - Deacon Road - Stafford County, VA  
2: Jett Street & Deacon Road














Existing (2019) Conditions  
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑↑	↑	
Traffic Vol, veh/h	168	46	2	173	18	1
Future Vol, veh/h	168	46	2	173	18	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	51	2	190	20	1

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	236	0	284	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1330	-	694	857
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	914	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1330	-	693	857
Mov Cap-2 Maneuver	-	-	-	-	693	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	912	-







Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	700	-	-	1330	-
HCM Lane V/C Ratio	0.03	-	-	0.002	-
HCM Control Delay (s)	10.3	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Traffic Volume (vph)	71	44	92	29	27	97
Future Volume (vph)	71	44	92	29	27	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3412	0	1770	1583
Flt Permitted	0.405				0.950	
Satd. Flow (perm)	754	3539	3412	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			33			110
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	254		167	
Travel Time (s)		10.9	3.8		3.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	81	50	138	0	31	110
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	32.0	70.0	38.0		30.0	32.0
Total Split (%)	32.0%	70.0%	38.0%		30.0%	32.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	22.1	28.3	12.5		6.3	8.3
Actuated g/C Ratio	0.70	0.90	0.40		0.20	0.26
v/c Ratio	0.11	0.02	0.10		0.09	0.22
Control Delay	3.3	2.6	9.4		13.0	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.3	2.6	9.4		13.0	3.1
LOS	A	A	A		B	A
Approach Delay		3.0	9.4		5.3	
Approach LOS		A	A		A	
Queue Length 50th (ft)	1	0	5		3	0
Queue Length 95th (ft)	22	8	28		23	15
Internal Link Dist (ft)		642	174		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	1458	3539	3200		1341	1418
Starvation Cap Reductn	0	0	0		0	0

## 1: Deacon Road &amp; Leeland Road

Timing Plan: AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.06	0.01	0.04		0.02	0.08

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 31.4

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.22

Intersection Signal Delay: 6.0

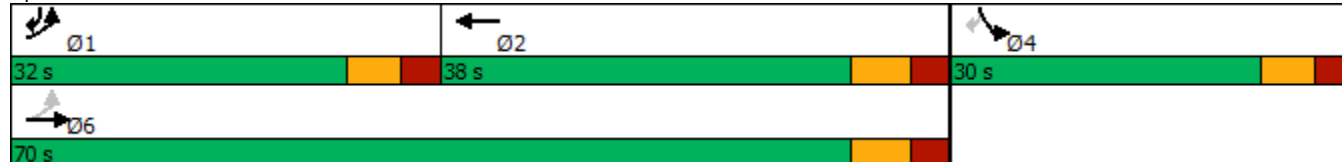
Intersection Capacity Utilization 30.4%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road



7-Eleven - Deacon Road - Stafford County, VA  
2: Jett Street & Deacon Road

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

Intersection














Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	55	16	2	101	29	6
Future Vol, veh/h	55	16	2	101	29	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	18	2	115	33	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	81
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.13
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.219
Pot Cap-1 Maneuver	-	-	1516
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1516
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-







Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	883	-	-	1516	-
HCM Lane V/C Ratio	0.045	-	-	0.001	-
HCM Control Delay (s)	9.3	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Traffic Volume (vph)	220	160	131	58	61	198
Future Volume (vph)	220	160	131	58	61	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3376	0	1770	1583
Flt Permitted	0.339				0.950	
Satd. Flow (perm)	631	3539	3376	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			64			218
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	254		167	
Travel Time (s)		10.9	3.8		3.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)						
Lane Group Flow (vph)	242	176	208	0	67	218
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	40.0	73.0	33.0		27.0	40.0
Total Split (%)	40.0%	73.0%	33.0%		27.0%	40.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effect Green (s)	25.2	29.1	7.8		7.6	16.8
Actuated g/C Ratio	0.62	0.72	0.19		0.19	0.42
v/c Ratio	0.37	0.07	0.30		0.20	0.28
Control Delay	6.9	4.9	13.5		19.2	2.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	6.9	4.9	13.5		19.2	2.1
LOS	A	A	B		B	A
Approach Delay		6.1	13.5		6.1	
Approach LOS		A	B		A	
Queue Length 50th (ft)	30	10	17		15	0
Queue Length 95th (ft)	64	23	45		46	22
Internal Link Dist (ft)		642	174		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	1428	3539	2338		953	1561
Starvation Cap Reductn	0	0	0		0	0

## 1: Deacon Road &amp; Leeland Road

Timing Plan: PM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.17	0.05	0.09		0.07	0.14

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 40.4

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 7.8

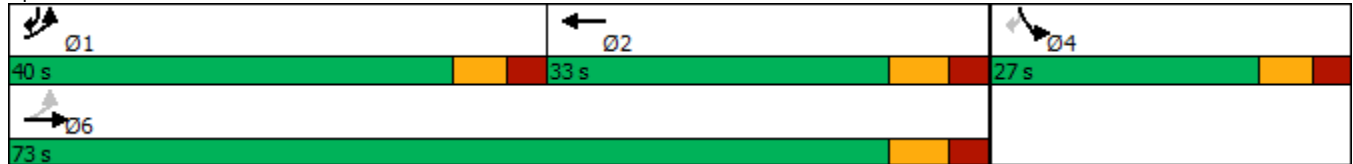
Intersection Capacity Utilization 39.7%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road



7-Eleven - Deacon Road - Stafford County, VA  
2: Jett Street & Deacon Road

No-Build (2020) Conditions

Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.5

Movement EBT EBR WBL WBT NBL NBR

Lane Configurations	↑	↑	↑	↑↑	↑	
Traffic Vol, veh/h	174	47	2	178	19	1
Future Vol, veh/h	174	47	2	178	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	52	2	196	21	1

Major/Minor Major1 Major2 Minor1

Conflicting Flow All	0	0	243	0	293	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	102	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1322	-	686	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	911	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1322	-	685	850
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	909	-

Approach EB WB NB

HCM Control Delay, s	0	0.1	10.4
HCM LOS			B

Minor Lane/Major Mvmt NBLn1 EBT EBR WBL WBT












Capacity (veh/h)	692	-	-	1322	-
HCM Lane V/C Ratio	0.032	-	-	0.002	-
HCM Control Delay (s)	10.4	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

# 7-Eleven - Deacon Road - Stafford County, VA

## 1: Deacon Road & Leeland Road

Build (2020) Conditions







Timing Plan: AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	81	44	110	29	22	88
Future Volume (vph)	81	44	110	29	22	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3429	0	1770	1583
Flt Permitted	0.401				0.950	
Satd. Flow (perm)	747	3539	3429	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			33			100
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	229		167	
Travel Time (s)		10.9	3.5		3.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	50	158	0	25	100
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	32.0	70.0	38.0		30.0	32.0
Total Split (%)	32.0%	70.0%	38.0%		30.0%	32.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	22.5	28.7	12.9		6.2	8.4
Actuated g/C Ratio	0.71	0.90	0.41		0.19	0.26
v/c Ratio	0.13	0.02	0.11		0.07	0.20
Control Delay	3.2	2.5	9.5		13.3	3.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.2	2.5	9.5		13.3	3.2
LOS	A	A	A		B	A
Approach Delay		3.0	9.5		5.2	
Approach LOS		A	A		A	
Queue Length 50th (ft)	1	0	6		3	0
Queue Length 95th (ft)	24	7	32		20	15
Internal Link Dist (ft)		642	149		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	1442	3539	3212		1327	1402
Starvation Cap Reductn	0	0	0		0	0



## 1: Deacon Road &amp; Leeland Road

Timing Plan: AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.06	0.01	0.05		0.02	0.07

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 31.8

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.20

Intersection Signal Delay: 6.1

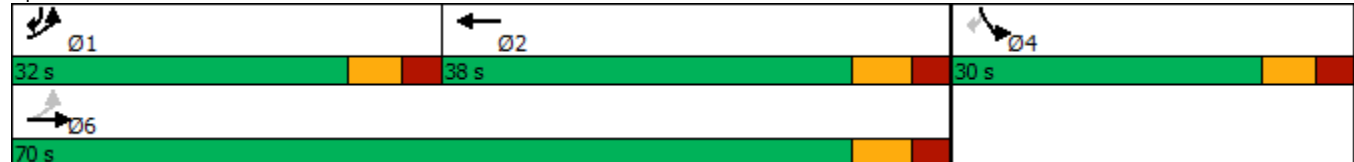
Intersection Capacity Utilization 30.7%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road



7-Eleven - Deacon Road - Stafford County, VA  
 2: Jett Street/Full-Movement Driveway & Deacon Road

Build (2020) Conditions  
 Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔			↔			↔	
Traffic Vol, veh/h	9	41	16	7	79	19	29	1	6	21	1	31
Future Vol, veh/h	9	41	16	7	79	19	29	1	6	21	1	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	47	18	8	90	22	33	1	7	24	1	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	65	0	0	129	195	47	197	202	56
Stage 1	-	-	-	-	-	-	67	67	-	117	117	-
Stage 2	-	-	-	-	-	-	62	128	-	80	85	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1477	-	-	1536	-	-	837	700	1022	753	694	999
Stage 1	-	-	-	-	-	-	943	839	-	876	798	-
Stage 2	-	-	-	-	-	-	942	790	-	928	824	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1477	-	-	1536	-	-	799	692	1022	740	686	999
Mov Cap-2 Maneuver	-	-	-	-	-	-	799	692	-	740	686	-
Stage 1	-	-	-	-	-	-	936	833	-	870	794	-
Stage 2	-	-	-	-	-	-	903	786	-	914	818	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0.5			9.6			9.4		
HCM LOS							A			A		




Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1477	-	-	1536	-	-	871
HCM Lane V/C Ratio	0.05	0.007	-	-	0.005	-	-	0.069
HCM Control Delay (s)	9.6	7.5	0	-	7.4	-	-	9.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

7-Eleven - Deacon Road - Stafford County, VA  
3: Leeland Road & RI/RO/LI Driveway

Build (2020) Conditions  
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	88	22	25	110
Future Vol, veh/h	0	23	88	22	25	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	100	25	28	125

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	113	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.23	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.319	-
Pot Cap-1 Maneuver	0	939	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	939	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.5
HCM LOS	A		












Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	939	1460
HCM Lane V/C Ratio	-	-	0.028	0.019
HCM Control Delay (s)	-	-	8.9	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1






# 7-Eleven - Deacon Road - Stafford County, VA

## 1: Deacon Road & Leeland Road

Build (2020) Conditions

Timing Plan: PM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	235	156	154	58	55	186
Future Volume (vph)	235	156	154	58	55	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1770	3539	3394	0	1770	1583
Flt Permitted	0.338				0.950	
Satd. Flow (perm)	630	3539	3394	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			53			204
Link Speed (mph)		45	45		35	
Link Distance (ft)		722	229		167	
Travel Time (s)		10.9	3.5		3.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	171	233	0	60	204
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	13.0	16.0	16.0		16.0	13.0
Total Split (s)	40.0	74.0	34.0		26.0	40.0
Total Split (%)	40.0%	74.0%	34.0%		26.0%	40.0%
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5		7.0	7.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	Min	Min		None	None
Act Effect Green (s)	25.9	29.7	8.3		7.4	16.9
Actuated g/C Ratio	0.63	0.73	0.20		0.18	0.41
v/c Ratio	0.39	0.07	0.32		0.19	0.26
Control Delay	6.9	4.8	14.5		19.6	2.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	6.9	4.8	14.5		19.6	2.2
LOS	A	A	B		B	A
Approach Delay		6.0	14.5		6.1	
Approach LOS		A	B		A	
Queue Length 50th (ft)	31	10	22		14	0
Queue Length 95th (ft)	67	22	53		44	22
Internal Link Dist (ft)		642	149		87	
Turn Bay Length (ft)	250					
Base Capacity (vph)	1418	3539	2389		893	1552
Starvation Cap Reductn	0	0	0		0	0

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.18	0.05	0.10		0.07	0.13

## Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 40.9

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 8.2

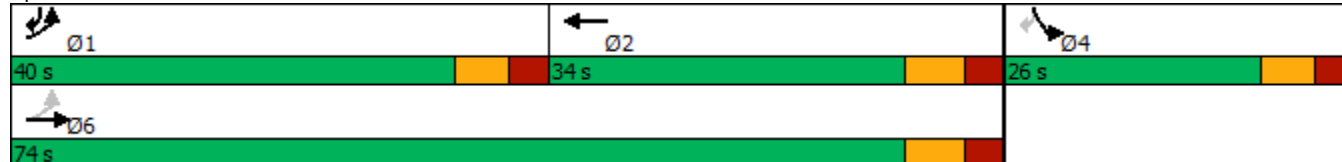
Intersection Capacity Utilization 41.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Deacon Road &amp; Leeland Road



7-Eleven - Deacon Road - Stafford County, VA  
2: Jett Street/Full-Movement Driveway & Deacon Road

Build (2020) Conditions  
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔			↔			↔	
Traffic Vol, veh/h	11	153	47	2	158	20	19	1	1	29	1	35
Future Vol, veh/h	11	153	47	2	158	20	19	1	1	29	1	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	168	52	2	174	22	21	1	1	32	1	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	196	0	0	220	0	0	284	392	168	408	433	98
Stage 1	-	-	-	-	-	-	192	192	-	189	189	-
Stage 2	-	-	-	-	-	-	92	200	-	219	244	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1376	-	-	1348	-	-	657	543	875	541	515	939
Stage 1	-	-	-	-	-	-	809	741	-	795	743	-
Stage 2	-	-	-	-	-	-	905	735	-	783	703	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1376	-	-	1348	-	-	623	537	875	535	509	939
Mov Cap-2 Maneuver	-	-	-	-	-	-	623	537	-	535	509	-
Stage 1	-	-	-	-	-	-	801	734	-	787	742	-
Stage 2	-	-	-	-	-	-	865	734	-	773	696	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	11	10.8
HCM LOS			B	B




Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	627	1376	-	-	1348	-	-	696
HCM Lane V/C Ratio	0.037	0.009	-	-	0.002	-	-	0.103
HCM Control Delay (s)	11	7.6	0	-	7.7	-	-	10.8
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

7-Eleven - Deacon Road - Stafford County, VA  
3: Leeland Road & RI/RO/LI Driveway

Build (2020) Conditions  
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	263	30	30	241
Future Vol, veh/h	0	27	263	30	30	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	289	33	33	265

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	306	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.23	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.319	-
Pot Cap-1 Maneuver	0	733	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	733	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	733	1236
HCM Lane V/C Ratio	-	-	0.04	0.027
HCM Control Delay (s)	-	-	10.1	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

# 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:	Ramey Kemp & Associates, Inc. - Michael Bailey, P.E., PTOE		
Tele:	(804) 217-8560		
E-mail:	mbailey@rameykemp.com		
Developer/Owner Name:	Verdad Real Estate - Ryan Orr		
Tele:	(817) 912-5872		
E-mail:	rorr@verdad.com		
Project Information			
Project Name:	7-Eleven - Deacon Road	Locality/County:	Stafford County
Project Location: (Attach regional and site specific location map)	See Figure 1		
Submission Type	Comp Plan <input type="checkbox"/>	Rezoning <input type="checkbox"/>	Site Plan <input checked="" 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)	Proposed 3,484 square foot (s.f.) gas station / convenience store will have 12 fueling positions and will replace the existing 7-Eleven store on the northeast corner of the Route 607 (Deacon Road) at Route 626 (Leeland Road) intersection. The proposed access plan includes narrowing the existing full-movement driveway on Leeland Road, and removing the outbound left-turn movement. The existing right-in / right-out driveway on Deacon Road will be shifted west to align with Jett Street, and will be converted to full-movement.		
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"/>
	<b>Residential Uses(s)</b> Number of Units: _____ ITE LU Code(s): _____ _____ _____ <b>Commercial Use(s)</b> ITE LU Code(s): 960 - 12 f.p. _____ _____ Square Ft or Other Variable: _____		_____ _____ _____ <b>Other Use(s)</b> ITE LU Code(s): _____ _____ _____ Independent Variable(s): _____ _____ _____

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.



Total Peak Hour Trip Projection:	Less than 100 <input type="checkbox"/>	100 – 499 <input checked="" type="checkbox"/>	500 – 999 <input type="checkbox"/>	1,000 or more <input type="checkbox"/>
<b>Traffic Impact Analysis Assumptions</b>				
Study Period	Existing Year: 2019	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)	None			
Consistency With Comprehensive Plan (Land use, transportation plan)	The current zoning allows the proposed use.			
Available Traffic Data (Historical, forecasts)	Deacon Road (West of Leeland) - 14,000 vpd in 2013 / 16,000 vpd in 2017 Deacon Road (East of Leeland) - 6,800 vpd in 2013 / 6,400 vpd in 2017 Leeland Road - 11,000 vpd in 2013 / 10,000 vpd in 2017			
Trip Distribution (Attach sketch)	Road Name: See Figure 2		Road Name:	
	Road Name:		Road Name:	
Annual Vehicle Trip Growth Rate:	3.0%	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. Deacon Road at Leeland Road		6.	
	2. Deacon Road at Proposed Full-Movement Site Driveway		7.	
	3. Leeland Road at Proposed Right-in / Right-out / Left-in Site Driveway		8.	
	4.		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,	Synchro / SimTraffic 10 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.

progression speed, cycle length)	
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 checked="" type="checkbox"/> Generalized Development Plan (GDP) <input type="checkbox"/> Preliminary/Sketch Plan <input type="checkbox"/> Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	<input checked="" type="checkbox"/> Queuing analysis <input type="checkbox"/> Actuation/Coordination <input type="checkbox"/> Weaving analysis <input type="checkbox"/> Merge analysis <input checked="" type="checkbox"/> Bike/Ped Accommodations <input checked="" type="checkbox"/> Intersection(s) <input type="checkbox"/> TDM Measures <input type="checkbox"/> Other _____

**NOTES on ASSUMPTIONS:**

The TIA will include three analysis scenarios:

- Existing (2019) Traffic Conditions
- No-Build (2020) Traffic Conditions
- Build (2020) Traffic Conditions

SIGNED:  DATE: 4/11/19  
Applicant or Consultant

PRINT NAME: Michael Bailey, PE, PTOE  
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.

**7-Eleven – Deacon Road  
Stafford County, VA  
ITE Trip Generation – Weekday – 10<sup>th</sup> Edition**

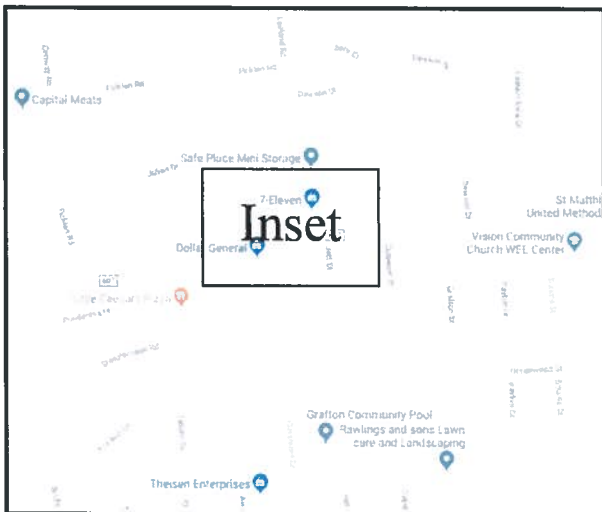
Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Super Convenience Market / Gas Station (960)	12 f.p.	1,383	1,383	75*	75*	91*	91*
ITE Pass-by Trips: 63% AM / 66% PM		-892	-892	-47	-47	-60	-60
<b>New Primary Trips</b>		<b>491</b>	<b>491</b>	<b>28</b>	<b>28</b>	<b>31</b>	<b>31</b>

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

**March 4, 2019**



Inset



Overview



**LEGEND**



Study Intersection



Site Boundary

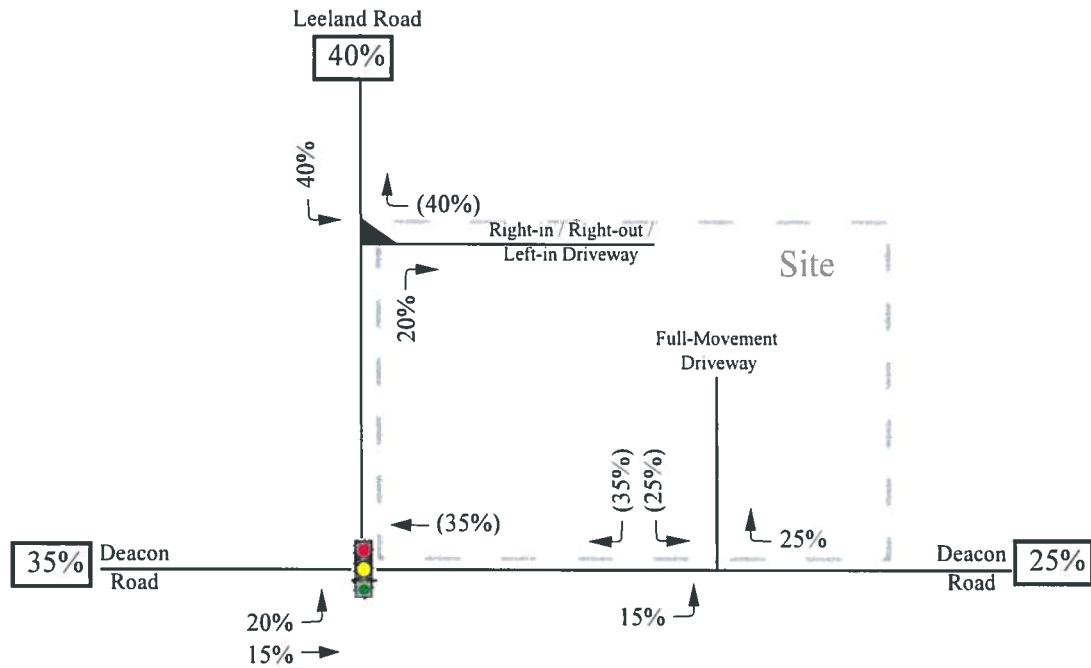


7-Eleven  
Deacon Road  
Stafford County, Virginia

Site Location and  
Study Intersections

Scale: Not to Scale

Figure 1



### LEGEND

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

XX% Regional Trip Distribution



7-Eleven  
Deacon Road  
Stafford County, Virginia

Primary  
Site Trip Distribution

Scale: Not to Scale

Figure 2

**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:

Name

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:

4/11/19

PRINT NAME:

Michael Bailey, PE, PTOE  
Applicant or Consultant

SIGNED:

David L. Beale  
VDOT Representative

DATE:

5/2/19

PRINT NAME

DAVID L. BEALE  
VDOT Representative

SIGNED:

Charles J. Hess  
Local Government Representative

DATE:

5/3/19

PRINT NAME:

Charles J. Hess  
Local Government Representative





# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF TRANSPORTATION

87 Deacon Road  
Fredericksburg, Virginia 22405

Stephen C. Brich, P.E.  
COMMISSIONER

June 17, 2019

County of Stafford  
P. O. Box 339  
Stafford, VA 22555-0339

RE: 7-Eleven @ Deacon Road - TIA Review #1  
Stafford County

Dear Mr. Geouge:

As requested by Stafford County on June 4, 2019, VDOT completed a review of the Traffic Impact Analysis (TIA) prepared by Ramey Kemp and Associates (dated March 21, 2019) in support of 7-Eleven at Deacon Road. This is a conditional use rezoning application. The proposed convenience store with 12 fueling positions is replacing an existing 7-Eleven Store generally located in the northeast quadrant of Rte 607 Deacon Road at Rte 626 Leeland Road. The proposed access plan includes narrowing the existing full movement driveway on Leeland Road and removing the outbound left turn movement. The existing RI/RO entrances on Deacon Road will be relocated and the entrance (full movement) shifted to align with Jett Street RTE 1019.

The TIA indicates the proposed development is proposing to develop a convenience store with 12 fueling positions.

VDOT offers the following comments to Stafford County for its comprehensive use. It should be noted that addressing these comments may change the results of the operational analyses. Although certain design features may be referenced in the comments, this review does not cover engineering details. These details, including but not limited to, signalization, site plan, retaining walls, turn-lane storage length, crossover spacing and entrance spacing issues, will be addressed at a later stage of development review.

### Traffic Engineering Comments:

1. For the Leeland entrance, our previously expressed preference for a ri/ro driveway only. The left in could become problematic. Is there a reason why does their driveway angle closer to the intersection instead of following their property line? The entrance should be located as close to the property line as possible. A condition should be included in any approval that they will close this driveway and share with the adjacent parcel should the

Page 2

RE: 7-Eleven @ Deacon Road, REW 1  
Stafford County

opportunity arise. Also, VDOT reserves the right to install a median in Leeland Road to prohibit the lefts in if they become problematic.

2. For the Deacon entrance, count the traffic at Jett Street and include that in the analysis of the full movement entrance. Please show how 7-Eleven's proposed driveway would interact with Jett Street.

Planning Comments:

1. For the Deacon Road Access Point: The left turns will conflict in a way that could produce problems. The lefts-in are shown in the approximate locations shown on the plan. Lefts-out should also be considered. Lefts into the 7-11 will be from the EB thru-lane. Is there an alternative that avoids some of these conflicts? See attached sketch.

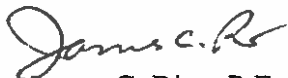
Land Development and GDP Comments:

Detailed construction / site plan has not been submitted or reviewed. These comments are general and additional comments may be rendered when an official site plan has been submitted for review by Stafford County.

1. The project must meet current VDOT design standards and specifications, SSAR and access management. A GDP should show the sight distance, VPD at entrances, functional classification and all spacing dimensions for all the roads and access points. Please provide all details on the site plan when submitted.
2. The Exhibit B did not provide sufficient information for access management. The access points appear they are within the functional area of the intersection and do not appear to meet spacing standard for access management. They will require an exception if they do not meet the standard requirements.

You may contact Margaret Niemann at (540) 899-4106 if there are any questions.

Sincerely,



James C. Rice, P.E.

Acting Area Land Use Engineer  
Fredericksburg Residency

Cc: Ramey Kemp and Associates



