

**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 280 ft to east / 120 feet to west along U.S. 60

**Requested exception:** Reduction in required spacing \_\_\_\_\_ ft 25 ft to east / 185 feet to west along U.S. 60

**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 2<sup>nd</sup> (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](mailto:Bradley.Shelton@VDOT.Virginia.gov)

October 8, 2018

Ms. Susan Kassel  
Director of Planning and Development Services  
York County  
224 Ballard Street  
Yorktown, Virginia 23690  
Phone: (757) 890-3531

Reference: Lightfoot Road C-Store  
Traffic Impact Analysis (TIA) and Access Management Exception (AME) Request  
York County and James City County, Virginia

Dear Ms. Kassel,

There is currently an Exxon station with 10 fueling positions in the northwest quadrant of the U.S. 60 (Richmond Road) at Lightfoot Road intersection. The Exxon station has two right-in / right-out driveways on U.S. 60, and one full-movement driveway on Lightfoot Road. The applicant is planning to redevelop the site, and construct a new convenience store with 12 fueling positions, and Ramey Kemp & Associates, Inc. (RKA) has performed this TIA to support the proposed redevelopment.

Based on meetings and coordination with the Virginia Department of Transportation (VDOT), the proposed access plan includes closing the eastern right-in / right-out driveway on U.S. 60, and shifting the site driveway on Lightfoot Road approximately 180 feet to the north, converting it to a partial access driveway with a right-in / right-out / left-out configuration, and constructing a southbound right-turn taper on Lightfoot Road. If approved, the proposed C-store is expected to be built in 2020. Figure 1 shows the site location and study intersections, and Figure 2 shows the conceptual site plan.

Based on the TIA scoping meeting with you and VDOT on February 6, the purpose of this letter report is to provide the following:

- Trip generation calculations
- Capacity analysis of the study intersections
- Evaluation of turn lane warrants at the site driveways
- AME Request for the existing right-in / right-out driveway on U.S. 60 that will remain

### **Existing Roadway Conditions**

U.S. 60 (Richmond Road) is a Principal Arterial with an average daily traffic (ADT) volume of approximately 20,000 vehicles per day (vpd), and a posted speed limit of 45 miles per hour (mph) in the vicinity of the site.

Lightfoot Road is a Major Collector with an ADT volume of approximately 8,800 vpd, and a posted speed limit of 45 mph in the vicinity of the site.

Figure 3 shows the existing lane configuration.

### **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 VHB Engineering at the following intersection in October 2016:

- U.S. 60 at Lightfoot Road / Williamsburg Outlet Mall Driveway

Based on discussion with VDOT, these traffic volumes were grown by 1.0% per year for two years to estimate the existing 2018 traffic volumes.

The AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were conducted by Peggy Malone & Associates at the following intersections on June 12, 2018:

- U.S. 60 at West Right-in / Right-out Driveway
- U.S. 60 at East Right-in / Right-out Driveway
- Lightfoot Road at Full-Movement Driveway

The traffic count data are enclosed, and the existing 2018 volumes are shown in Figure 4.

### **Approved Development**

Lightfoot Apartments is a potential mixed-use development located in the southeast quadrant of the Lightfoot Road at Old Mooretown Road intersection. The site plan includes 216 apartments, 32 townhomes, up to 13,000 square feet (s.f.) of general office and retail space, and up to 7,000 s.f. of restaurant space. The Lightfoot Apartment site trips shown in Figure 5 are based on the September 2017 Lightfoot Apartments TIA prepared by VHB.

Lightfoot Marketplace is a commercial center on the south side of U.S. 60 across from the site. The original TIA was performed by Bryant B. Goodloe, P.C. in October 2013, which included a number of outparcels along U.S. 60, which are now approved for construction:

- 26,625 s.f. of medical / dental office space
- 33,943 s.f. of general retail space
- 5,000 s.f. expansion of the existing Harris Teeter store
- Panera restaurant with 100 seats
- Fuel center with 10 fueling positions

Bryant B. Goodloe, P.C. submitted an updated trip generation memo for these uses in September 2017. The trip generation potential and distribution of those trips are included in this analysis based on that memo.

The trip generation potential of the Lightfoot Marketplace outparcels 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*. Table 1 summarizes the trip generation calculations for the Lightfoot Marketplace outparcels.

**Table 1**  
**Lightfoot Marketplace Outparcels – ITE Trip Generation – Weekday – 10<sup>th</sup> Edition**

Land Use (ITE Land Use Code)	Size	Average Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Medical-Dental Office (720)	26,625 s.f.	468	468	58	16	26	66
General Retail Space (820)	33,943 s.f.	1,442	1,442	20	12	117	127
Supermarket (850)	5,000 s.f. expansion	784	784	11	8	42	41
Fast-Food Restaurant with Drive-Thru Window (934)	100 seats	976	976	69	62	51	46
Gasoline / Service Station (944)	10 f.p.	860	860	51	52	70	70
Driveway Volumes		4,530	4,530	209	150	306	350
Pass-By Trips:							
General Retail – 34%		-490	-490	-5	-5	-41	-41
Supermarket – 36%		-282	-282	-3	-3	-14	-14
Fast-Food Restaurant – 49% AM / 50% PM		-483	-483	-32	-32	-24	-24
Gas Station – 58% AM / 42% PM		-430	-430	-29	-29	-29	-29
<b>Net New External Trips</b>		<b>2,845</b>	<b>2,845</b>	<b>137</b>	<b>81</b>	<b>198</b>	<b>242</b>

The Lightfoot Marketplace trip distributions and assignments are shown in Figure 6. The total approved development trips are shown in Figure 7.

### Background Traffic Growth

Based on discussion with you and VDOT, the 2018 peak hour traffic volumes were grown by an annual rate of 1.0% for two years to estimate the 2020 peak hour traffic volumes. The no-build 2020 peak hour trips were estimated by growing the existing volumes for two years and combining the approved development trips (Figure 7). Figure 8 shows the estimated 2020 no-build peak hour traffic volumes.

### Trip Generation

The trip generation potential of the proposed C-store during a typical weekday, AM peak hour, and PM peak hour was estimated using the methodologies published by the ITE *Trip Generation Manual – 10<sup>th</sup> Edition*. Table 2 summarizes the trip generation calculations.

**Table 2**  
**Lightfoot Road C-Store – 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	169	169	138	138
Pass-By Trips – 63% AM / 66% PM		-892	-892	-106	-106	-91	-91
<b>Net New External Trips</b>		<b>491</b>	<b>491</b>	<b>63</b>	<b>63</b>	<b>47</b>	<b>47</b>

C-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. Table 2 shows the ITE pass-by trip adjustments that were applied in the study.

### Site Traffic Distribution

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

- 40% to / from the east on U.S. 60
- 30% to / from the west on U.S. 60
- 25% to / from the north on Lightfoot Road
- 5% to / from the south on the Williamsburg Outlet Mall Driveway

It was assumed that all of the pass-by trips will originate from U.S. 60, and the following pass-by trip directional distributions were used:

- 75% westbound / 25% eastbound

Figure 10 shows the primary and pass-by site trip distributions, Figure 11 shows the primary and pass-by site trip assignments, and Figure 12 shows the total site trips.

### Existing Exxon Trip Adjustment

Under build conditions, the existing Exxon trips were removed from the roadway network as shown in Figure 9. The build 2020 peak hour volumes, which are shown in Figure 12, were estimated by combining the no-build volumes (Figure 8) with the existing trip adjustment (Figure 9) and the total site trips (Figure 12).

### **VDOT Intersection Spacing Standards**

VDOT requires at least 250 feet of separation between partial access driveways and full-movement intersections on Major Collector roadways posted 45 mph. The proposed right-in / right-out / left-out driveway on Lightfoot Road is approximately 380 feet north of the intersection of U.S. 60 and Lightfoot Road, which exceeds VDOT's minimum intersection spacing standards.

VDOT requires at least 305 feet of separation between partial access driveways and full-movement driveways on Principal Arterial roadways posted 45 mph. The proposed right-in / right-out driveway on U.S. 60 is approximately 280 feet west of Lightfoot Road and approximately 120 east of the Hardee's driveway, which does not meet VDOT's minimum intersection spacing standards. An Access Management Exception (AME) request form is enclosed.

### **VDOT Turn Lane Warrant Analysis**

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

- A southbound right-turn lane or taper on Lightfoot Road is not warranted, but the applicant is proposing a southbound right-turn taper to improve Lightfoot Road as much as possible along the property frontage

The VDOT turn lane warrant diagram is enclosed for reference.



### 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 3 summarizes the capacity analysis results for the signalized intersection of U.S. 60 at Lightfoot Road / Williamsburg Outlet Mall Driveway.

**Table 3**  
**Level-of-Service Summary for U.S. 60 at Lightfoot Road / Williamsburg Outlet Mall 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 2018 Traffic Conditions	EBU/L	D	50.1	219	C (23.6 sec)	E	71.4	320	C (30.7 sec)
	EBT	B	15.8	218		C	25.7	365	
	EBR	A	0.1	0		A	0.2	0	
	WBL	D	49.1	45		D	50.6	85	
	WBT	C	25.1	207		C	32.1	378	
	WBR	A	0.1	0		A	0.2	0	
	NBL	D	49.4	51		D	50.7	85	
	NBL/T	D	49.4	53		D	50.5	87	
	NBR	A	1.2	0		A	1.7	0	
	SBT/L	D	50.7	173		E	57.8	371	
No-Build 2020 Traffic Conditions	SBR	A	8.9	49		A	7.8	78	
	EBU/L	D	50.8	212	C (26.0 sec)	E	75.3	319	D (35.1 sec)
	EBT	C	20.3	214		C	32.1	356	
	EBR	A	4.0	34		A	4.6	47	
	WBL	D	53.4	104		E	58.5	174	
	WBT	C	27.9	218		D	35.9	382	
	WBR	A	0.1	0		A	0.2	0	
	NBL	D	51.3	76		D	54.2	140	
	NBL/T	D	51.0	76		D	54.1	141	
	NBR	A	2.2	0		B	11.6	60	
	SBT/L	D	51.7	195		E	65.4	396	
Build 2020 Traffic Conditions	SBR	A	8.6	52		B	13.8	138	
	EBU/L	D	51.7	251	C (28.3 sec)	E	60.6	315	D (39.0 sec)
	EBT	C	20.7	201		C	33.5	350	
	EBR	A	3.9	34		A	4.7	47	
	WBL	E	57.1	107		E	56.2	172	
	WBT	C	32.0	229		D	48.0	458	
	WBR	A	0.1	0		A	0.2	0	
	NBL	D	52.2	77		D	54.4	140	
	NBL/T	D	52.3	81		D	54.3	143	
	NBR	A	2.3	0		B	11.6	60	
	SBT/L	D	52.2	239		E	72.7	470	
	SBR	A	7.7	51		B	16.4	163	

Capacity analysis indicates this intersection currently operates at LOS C during the AM and PM peak hours. Under no-build 2020 traffic conditions, this intersection is expected to operate at LOS C during the AM peak hour and at LOS D during the PM peak hour. Under build 2020 traffic conditions, this intersection is projected to continue to operate at LOS C during the AM peak hour and at LOS D during the PM peak hour with all movements operating at LOS E or better.

The following improvement is recommended to accommodate the projected queue length on the eastbound U.S. 60 left-turn lane:

- Extend the eastbound left-turn lane on U.S. 60 from 275 feet to 325 feet

Table 4 summarizes the capacity analysis results for the unsignalized intersection of Lightfoot Road at Site Driveway.

**Table 4**  
**Level-of-Service Summary for Lightfoot Road at Site 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 2018 Traffic Conditions	EBL <sup>1</sup>	B	14.3	3	N/A <sup>3</sup>	C	22.4	3	N/A <sup>3</sup>
	EBR <sup>1</sup>	B	10.1	0		B	12.9	0	
	NBL/T <sup>2</sup>	A	8.0	0		A	9.0	0	
	SBT/R	-	-	-		-	-	-	
No-Build 2020 Traffic Conditions	EBL <sup>1</sup>	B	15.1	3	N/A <sup>3</sup>	C	24.3	3	N/A <sup>3</sup>
	EBR <sup>1</sup>	B	10.5	0		B	13.3	0	
	NBL/T <sup>2</sup>	A	8.1	0		A	9.1	0	
	SBT/R	-	-	-		-	-	-	
Build 2020 Traffic Conditions	EBL <sup>1</sup>	C	15.4	3	N/A <sup>3</sup>	D	25.5	5	N/A <sup>3</sup>
	EBR <sup>1</sup>	B	11.3	13		B	14.8	13	
	NBT	-	-	-		-	-	-	
	SBT/R	-	-	-		-	-	-	

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 the minor street left-turn movement currently operates with short delays (less than 25 seconds) during the AM and PM peak hours. Under no-build 2020 traffic conditions, the minor street left-turn movement is expected to continue to operate with short delays (less than 25 seconds) during the AM and PM peak hours.

The proposed redevelopment includes shifting this driveway approximately 180 feet to the north along Lightfoot Road, converting it to partial access with a right-in / right-out / left-out configuration, and constructing a southbound right-turn taper on Lightfoot Road. Under the build 2020 traffic conditions, the minor street left-turn movement 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 with the proposed improvements.

Table 5 summarizes the capacity analysis results for the unsignalized intersection of U.S. 60 at Right-in / Right-out Driveway.

**Table 5**  
**Level-of-Service Summary for U.S. 60 at Right-in / Right-out Driveway**

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing 2018 Traffic Conditions	EBT WBT WBR SBR <sup>1</sup>	- - - B	- - - 10.8	- - - 3	N/A <sup>2</sup>	- - - B	- - - 14.8	- - - 5	N/A <sup>2</sup>
No-Build 2020 Traffic Conditions	EBT WBT WBR SBR <sup>1</sup>	- - - B	- - - 11.1	- - - 3	N/A <sup>2</sup>	- - - C	- - - 15.7	- - - 5	N/A <sup>2</sup>
Build 2020 Traffic Conditions	EBT WBT WBR SBR <sup>1</sup>	- - - B	- - - 11.4	- - - 10	N/A <sup>2</sup>	- - - C	- - - 16.7	- - - 15	N/A <sup>2</sup>

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

Capacity analysis indicates the minor street right-turn movement currently operates with short delays (less than 25 seconds) during the AM and PM peak hours. Under no-build and build 2020 conditions, the minor street right-turn movement is expected to continue to operate with short delays (less than 25 seconds) at build out of the proposed redevelopment. No improvements are warranted or recommended at this intersection.

### Recommendations

Based on the capacity analysis, the following improvements are recommended to accommodate the projected 2020 traffic volumes:

#### U.S. 60 at Lightfoot Road / Williamsburg Outlet Mall Driveway:

- Extend the eastbound left-turn lane on U.S. 60 from 275 feet to 325 feet

#### Lightfoot Road at Proposed Right-in / Right-out / Left-out Driveway:

- Construct the site driveway with one ingress lane and two egress lanes
- Construct a southbound taper on Lightfoot Road

Figure 13 shows the recommended roadway laneage.

Ms. Susan Kassel  
Page 9 of 9

Based on the results of the traffic capacity analysis, we recommend approval of the AME request for the existing right-in / right-out driveway on U.S. 60 that will remain for the following reasons:

- The applicant will close the eastern right-in / right-out driveway on U.S. 60
- The full-movement site driveway on Lightfoot Road will be downgraded to a partial access driveway, and shifted approximately 180 feet to the north to increase the separation from U.S. 60
- All of the study intersections will function at an acceptable overall level-of-service at build-out of the proposed redevelopment
- Figure 14 shows that this site is on an established business corridor on a highway where the existing driveway spacing does not meet current standards

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

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

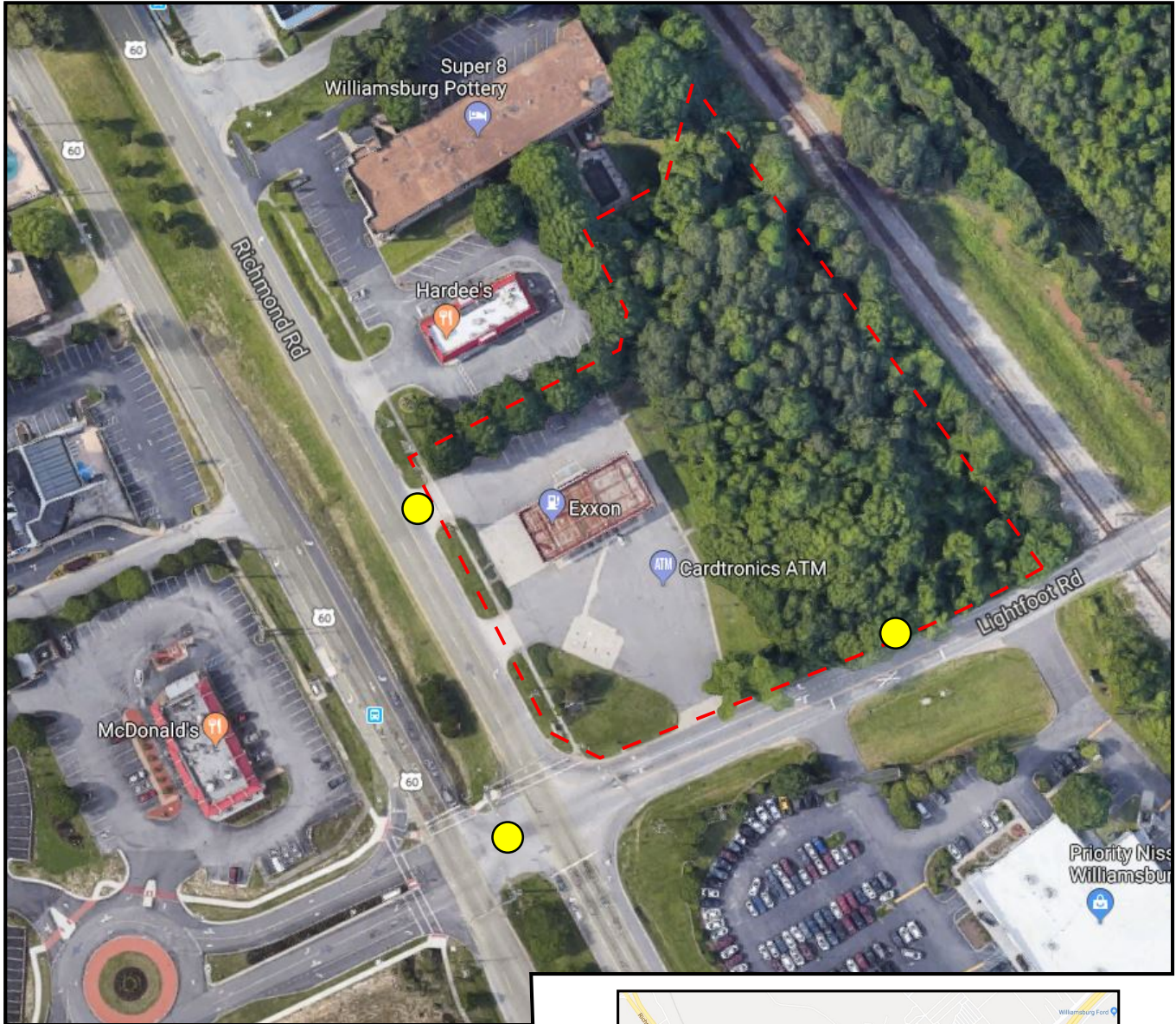


Carl Hultgren, P.E., PTOE  
Regional Manager

Enclosures: Figures, VDOT turn lane warrant diagram, Traffic count data, Synchro output

Copy to: Mr. Paul Holt, AICP, York County Planning  
Ms. Ellen Cook, York County Planning  
Mr. Jason Fowler, P.E., VDOT  
Mr. Glenn Brooks, P.E., VDOT  
Mr. Andy Sadler, Woodfin  
Mr. Timothy Trant, Kaufman & Canoles, P.C.  
Mr. Dan Caskie, P.E., Bay Companies





Inset



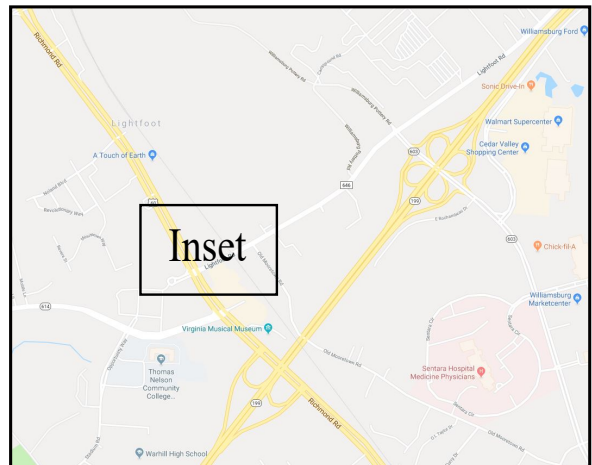
**LEGEND**



Study Intersection



Site Boundary



Overview



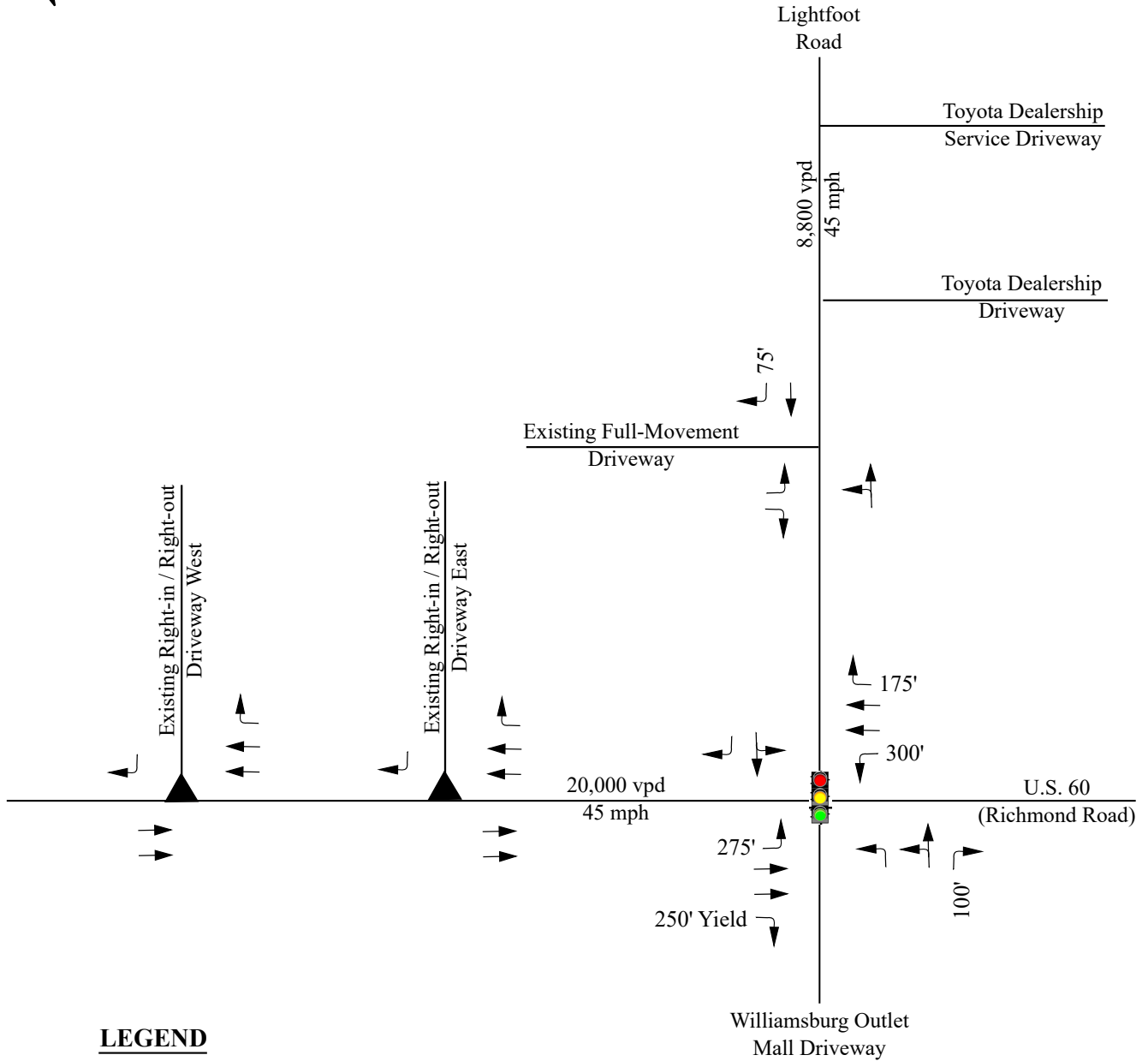
Lightfoot Road C-Store  
York County and James City County,  
Virginia

Site Location and  
Study Intersections

Scale: Not to Scale

Figure 1





### LEGEND



Existing Traffic Signal



Existing Lane

X'

Storage (In Feet)



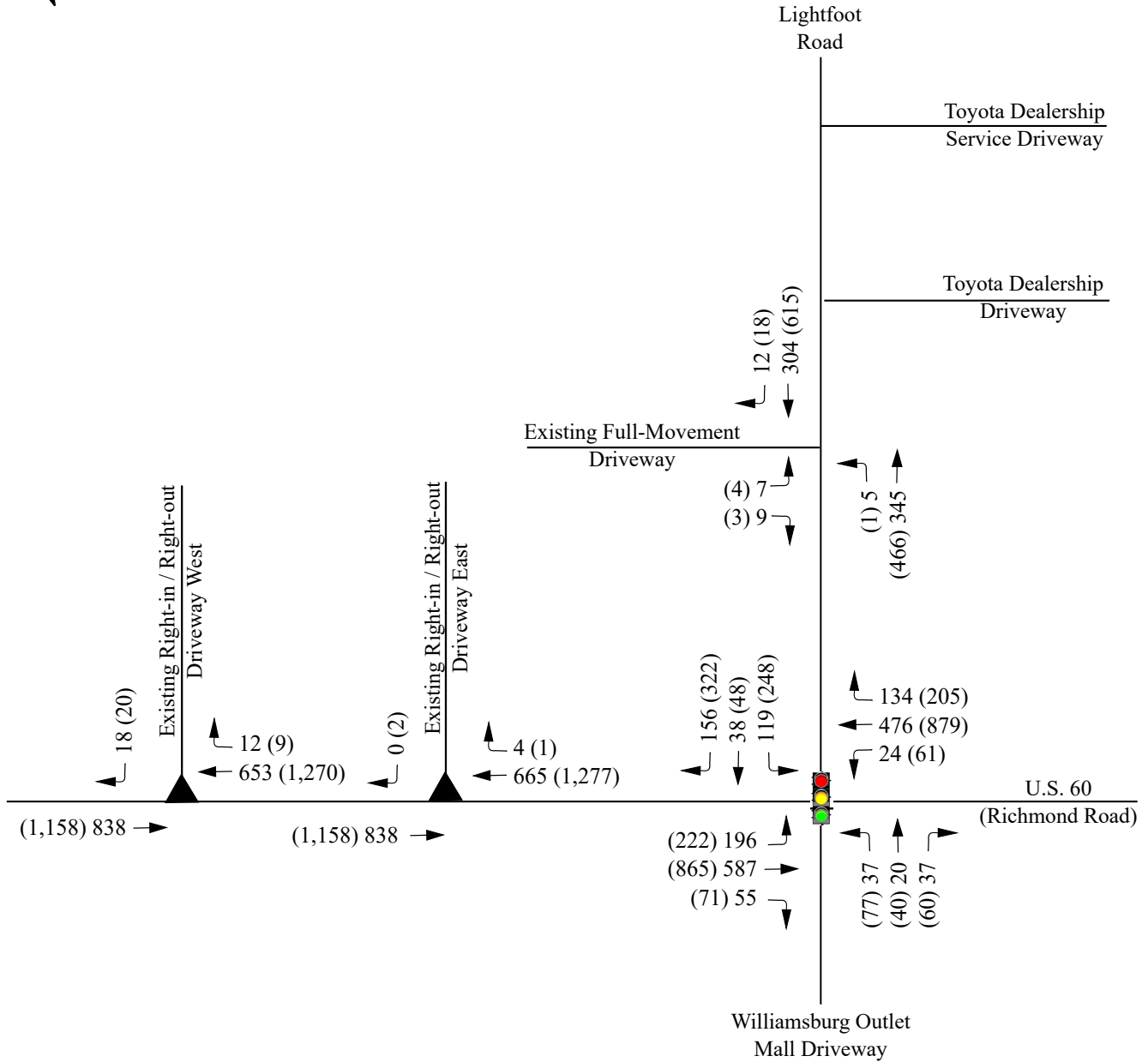
**RAMEY KEMP  
&  
ASSOCIATES**  
TRANSPORTATION ENGINEERS

Lightfoot Road C-Store  
York County and James City County,  
Virginia

Existing  
Lane Configurations

Scale: Not to Scale

Figure 3



### LEGEND

X (Y) AM (PM) Peak Hour



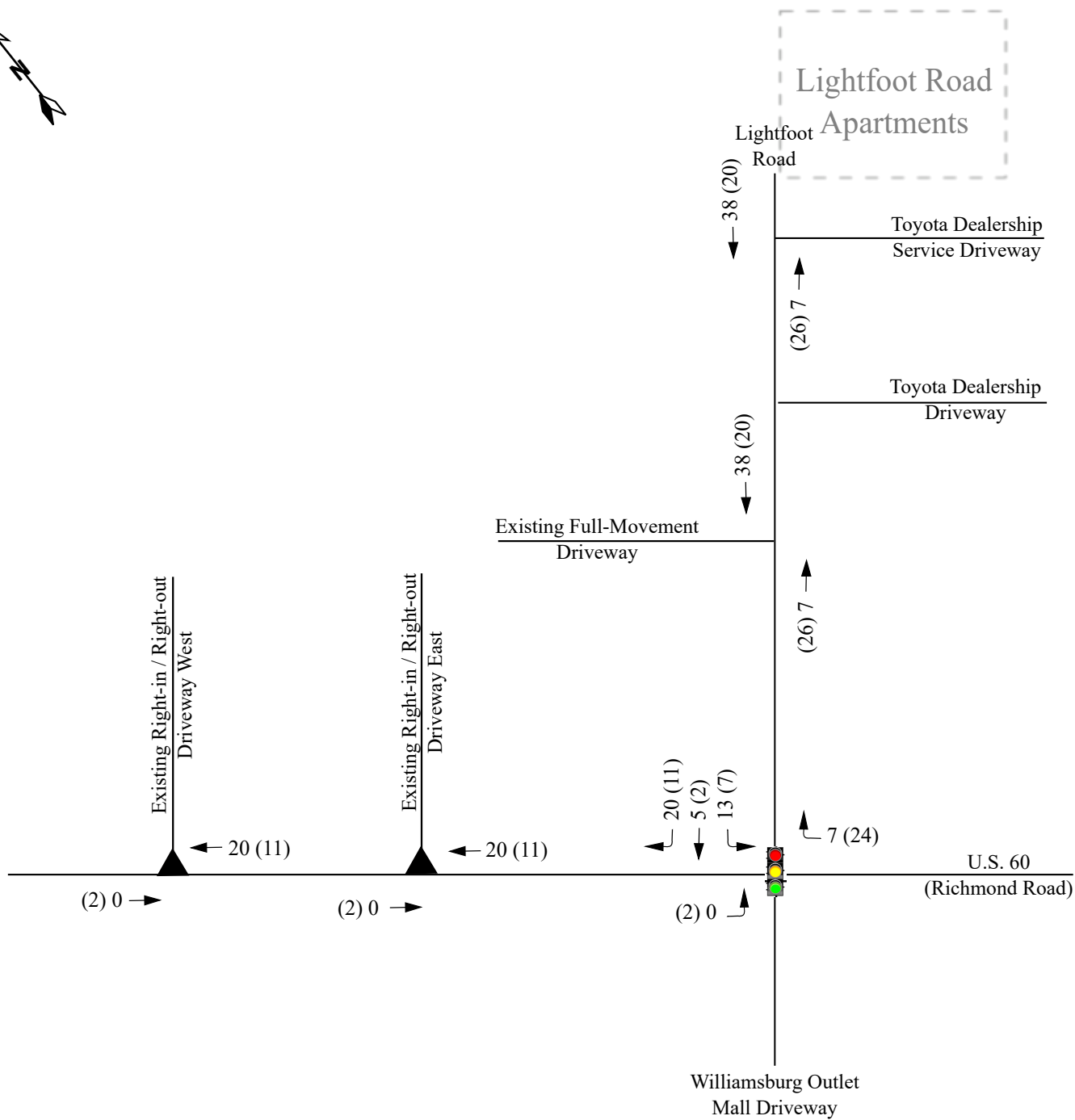
Lightfoot Road C-Store  
York County and James City County,  
Virginia

Existing (2018)  
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 4





### LEGEND

X (Y) AM (PM) Peak Hour



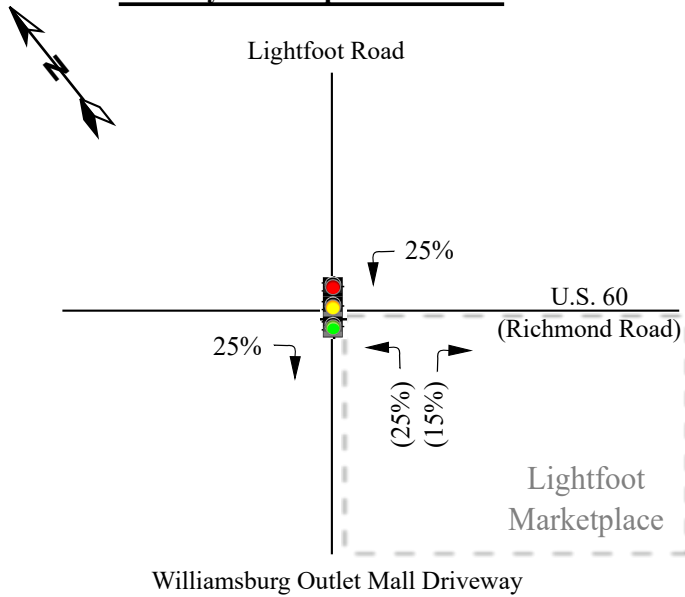
Lightfoot Road C-Store  
York County and James City County,  
Virginia

Lightfoot Apartments  
Site Trips

Scale: Not to Scale

Figure 5

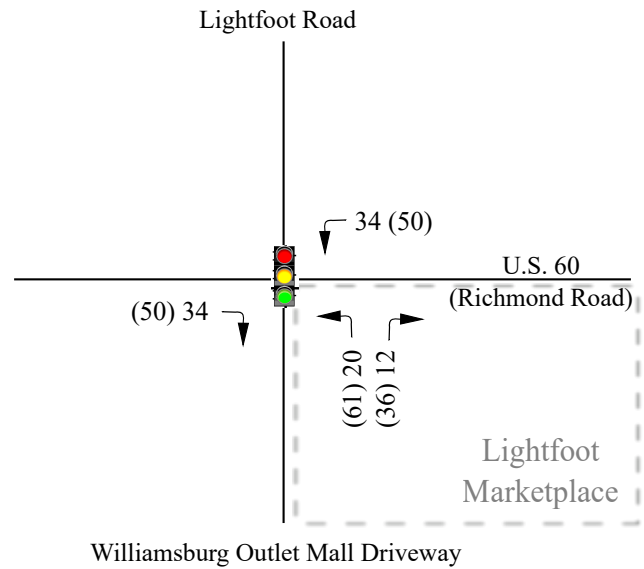
### Primary Site Trip Distribution



### LEGEND

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

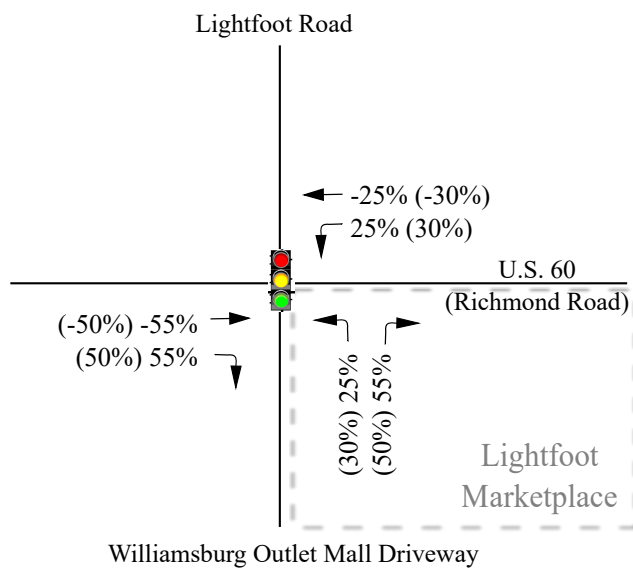
### Primary Site Trip Assignment



### LEGEND

X (Y) AM (PM) Peak Hour

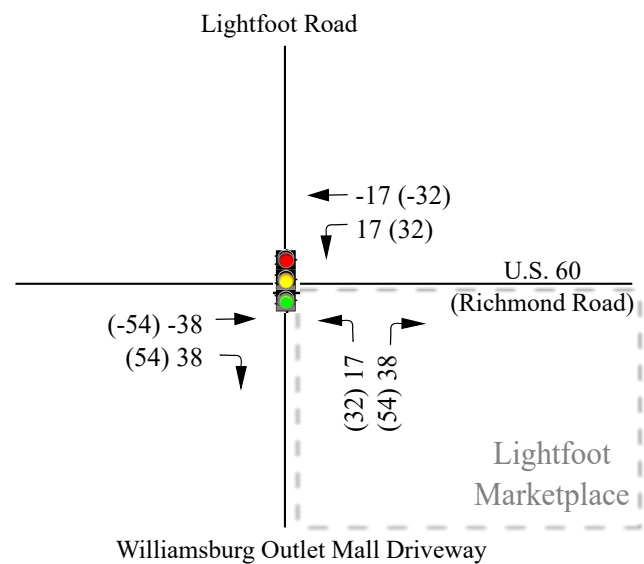
### Pass-By Site Trip Distribution



### LEGEND

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

### Pass-By Site Trip Assignment



### LEGEND

X (Y) AM (PM) Peak Hour

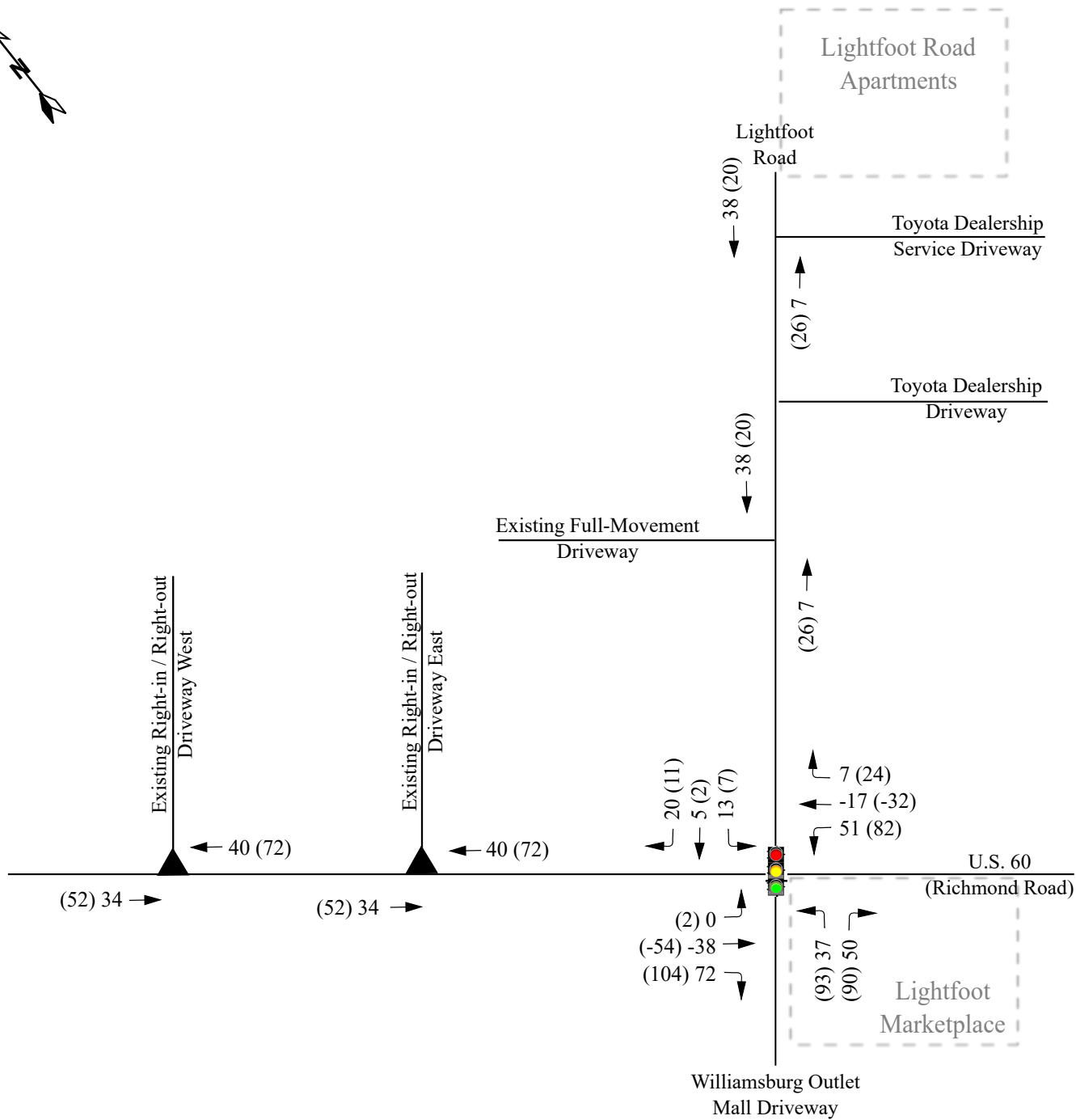


Lightfoot Road C-Store  
York County and James City County,  
Virginia

Lighfoot Marketplace  
Distribution and Assignments

Scale: Not to Scale

Figure 6



### LEGEND

X (Y) AM (PM) Peak Hour

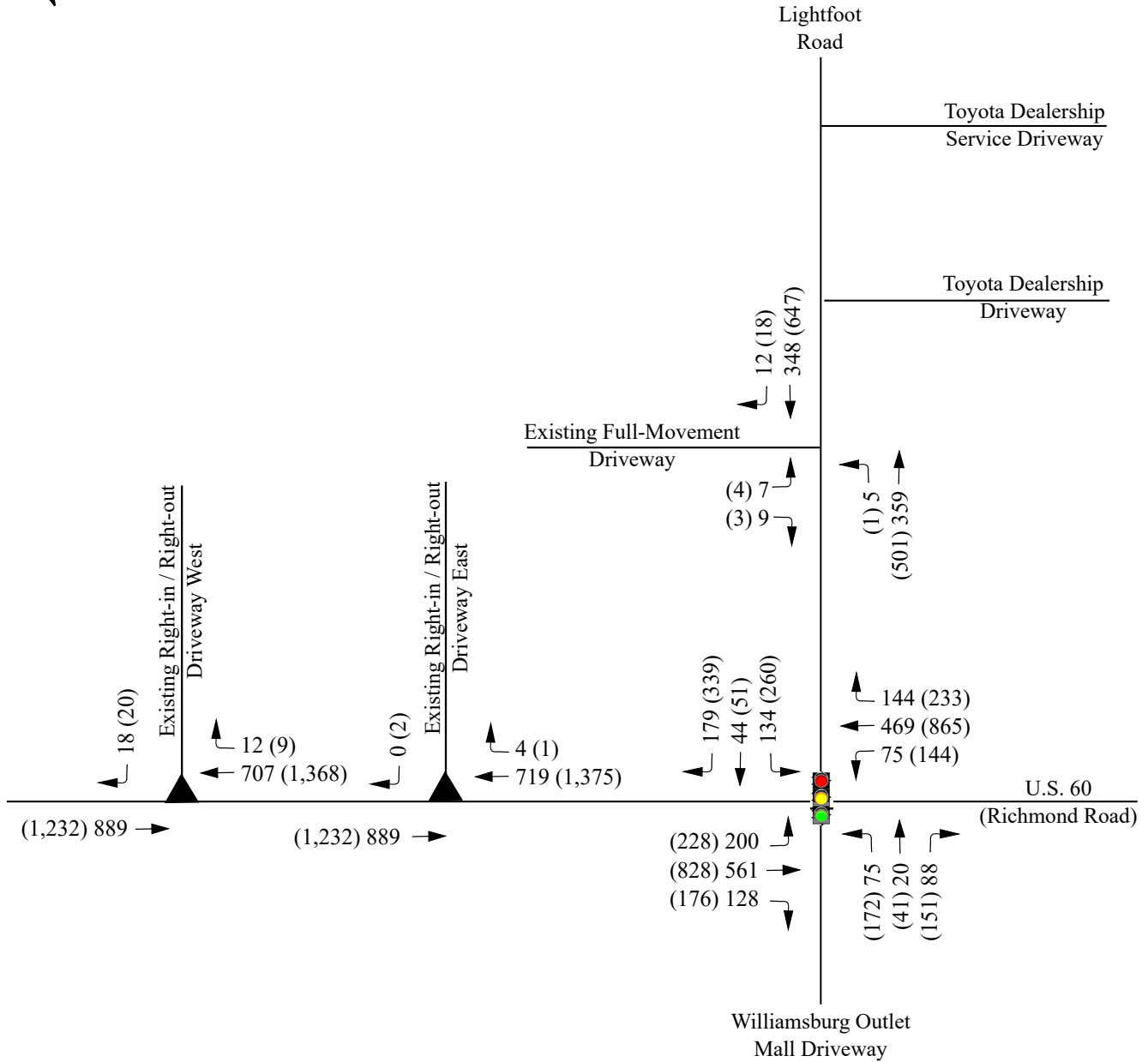


Lightfoot Road C-Store  
York County and James City County,  
Virginia

Total Approved Development  
Volumes

Scale: Not to Scale

Figure 7



### LEGEND

X (Y) AM (PM) Peak Hour

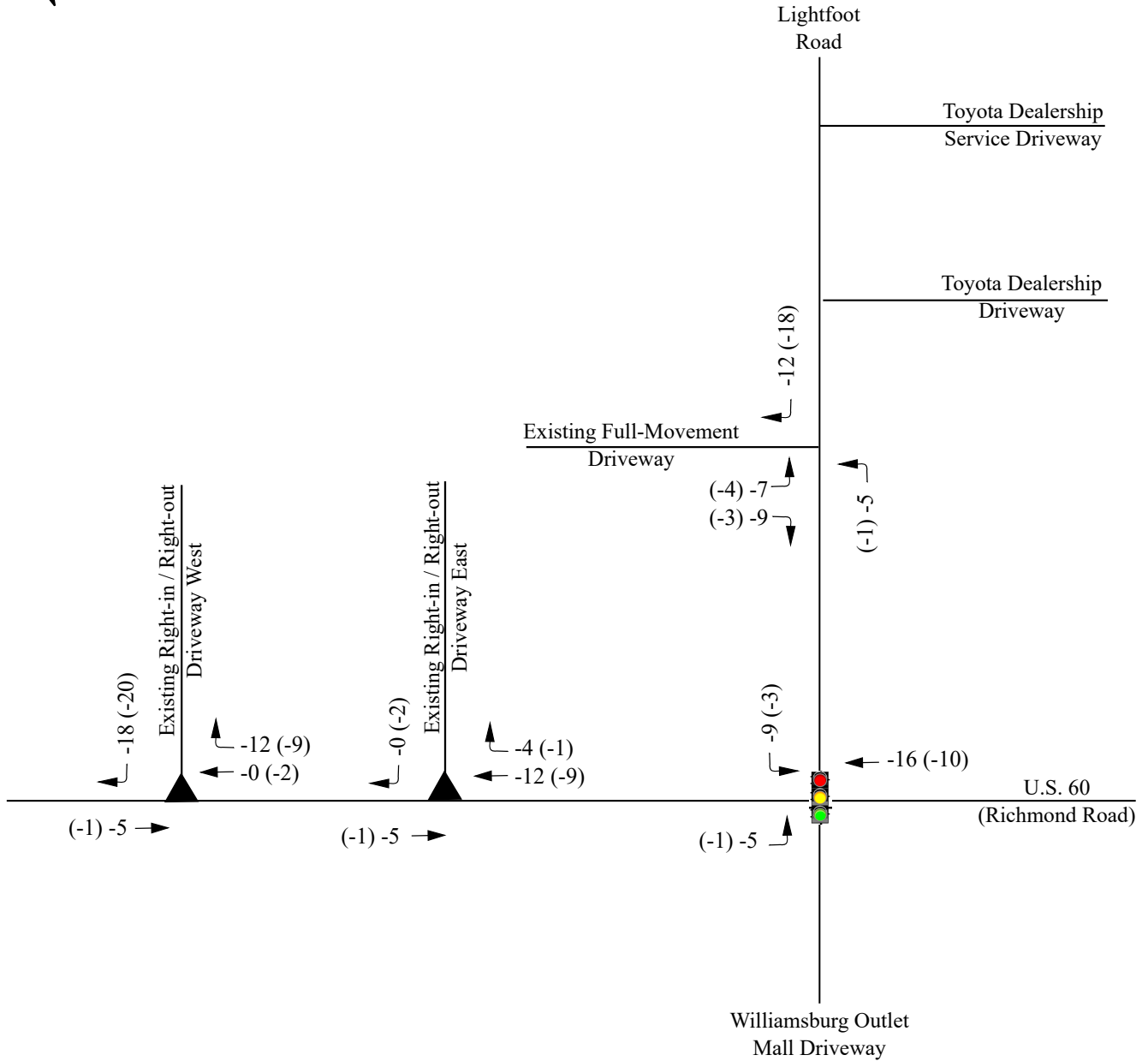


**Lightfoot Road C-Store**  
York County and James City County,  
Virginia

No-Build (2020) Peak Hour  
Traffic Volumes

Scale: Not to Scale

Figure 8



### LEGEND

X (Y) AM (PM) Peak Hour



Lightfoot Road C-Store  
York County and James City County,  
Virginia

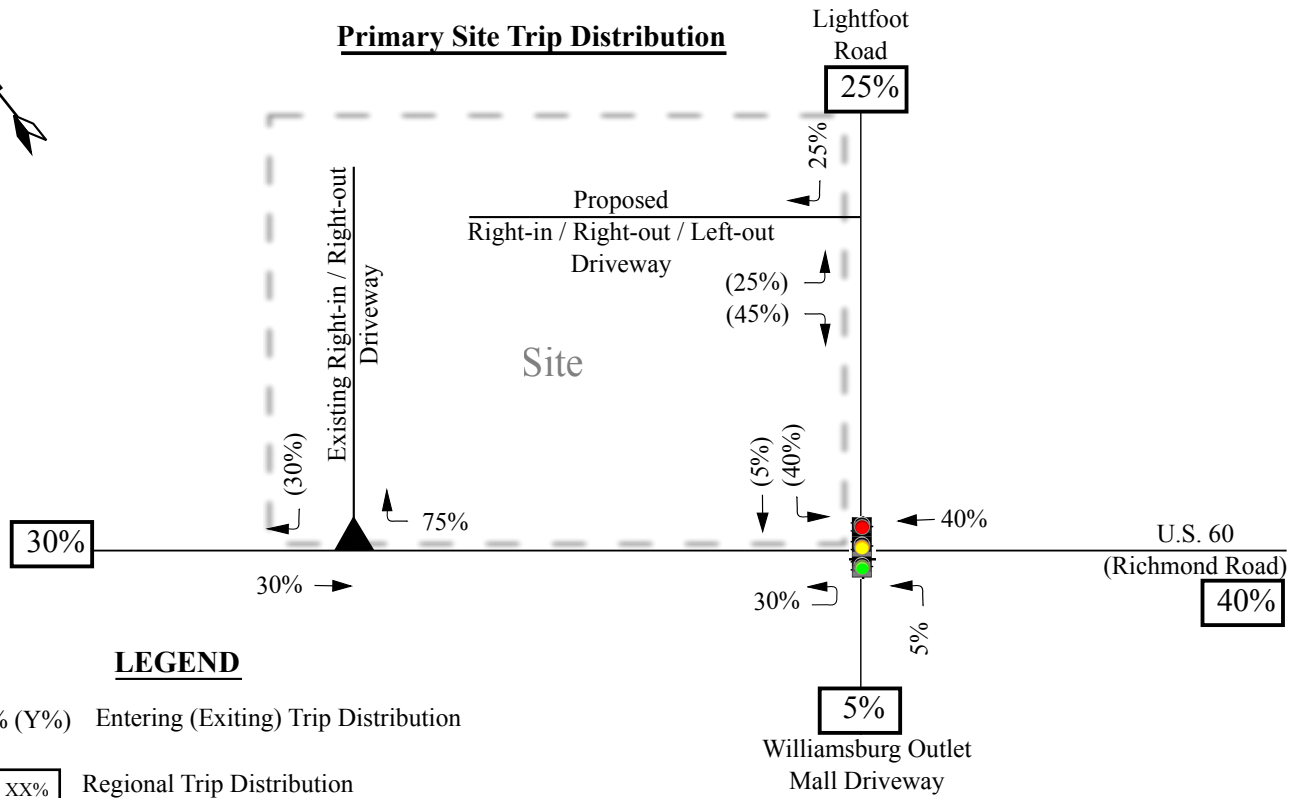
Existing Site Trip Adjustment

Scale: Not to Scale

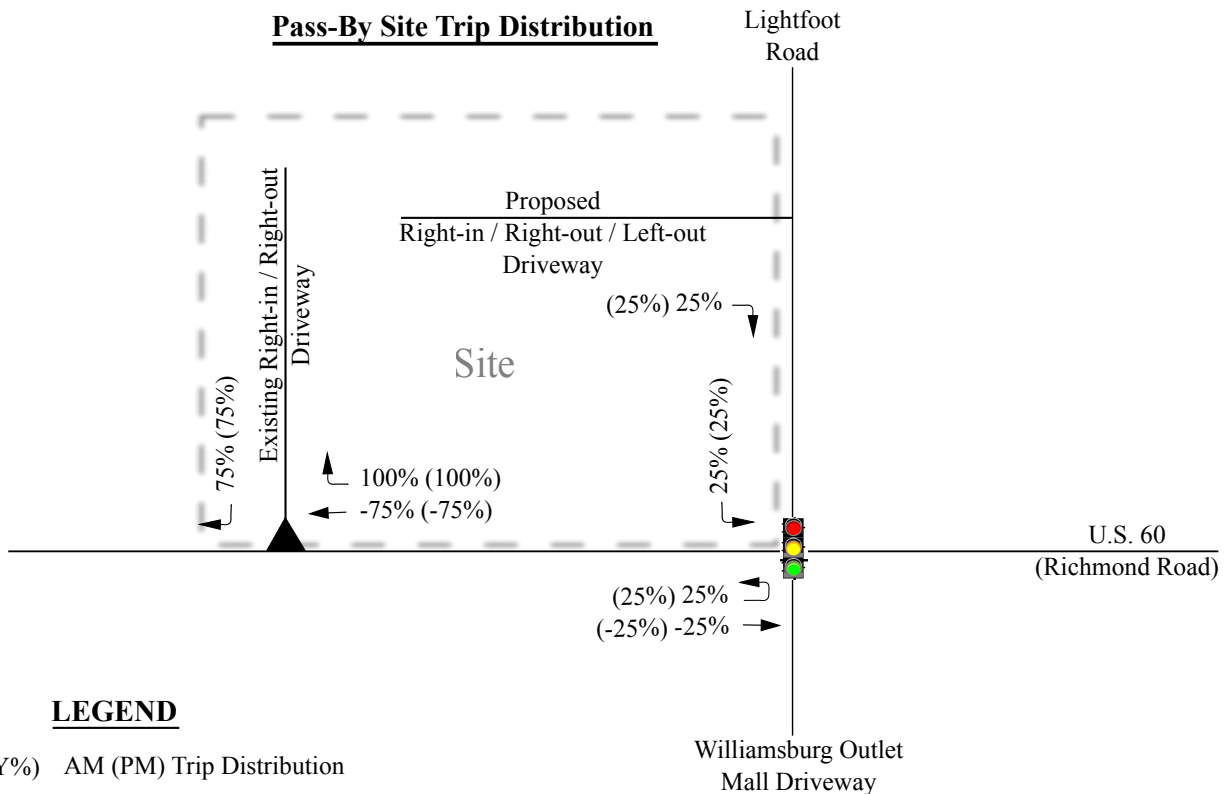
Figure 9



### Primary Site Trip Distribution



### Pass-By Site Trip Distribution



Lightfoot Road C-Store  
York County and James City County,  
Virginia

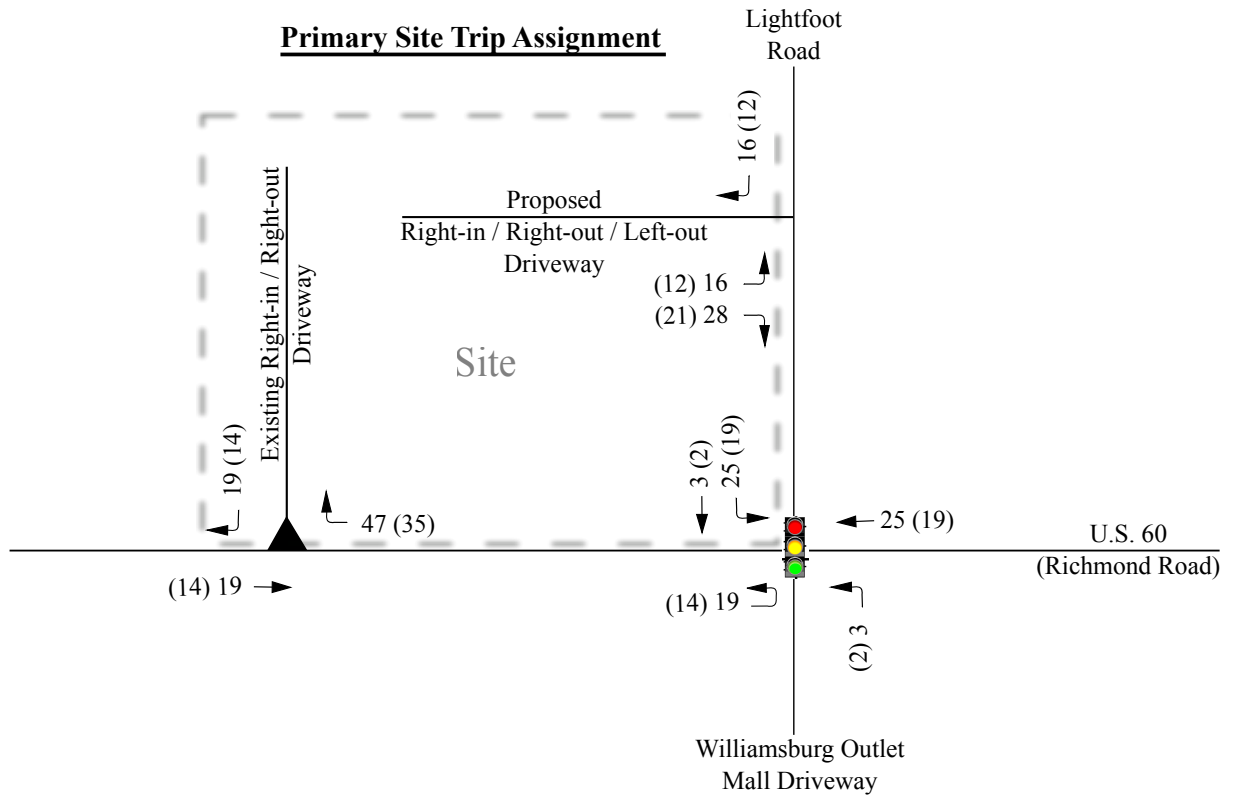
Primary and Pass-By  
Site Trip Distribution

Scale: Not to Scale

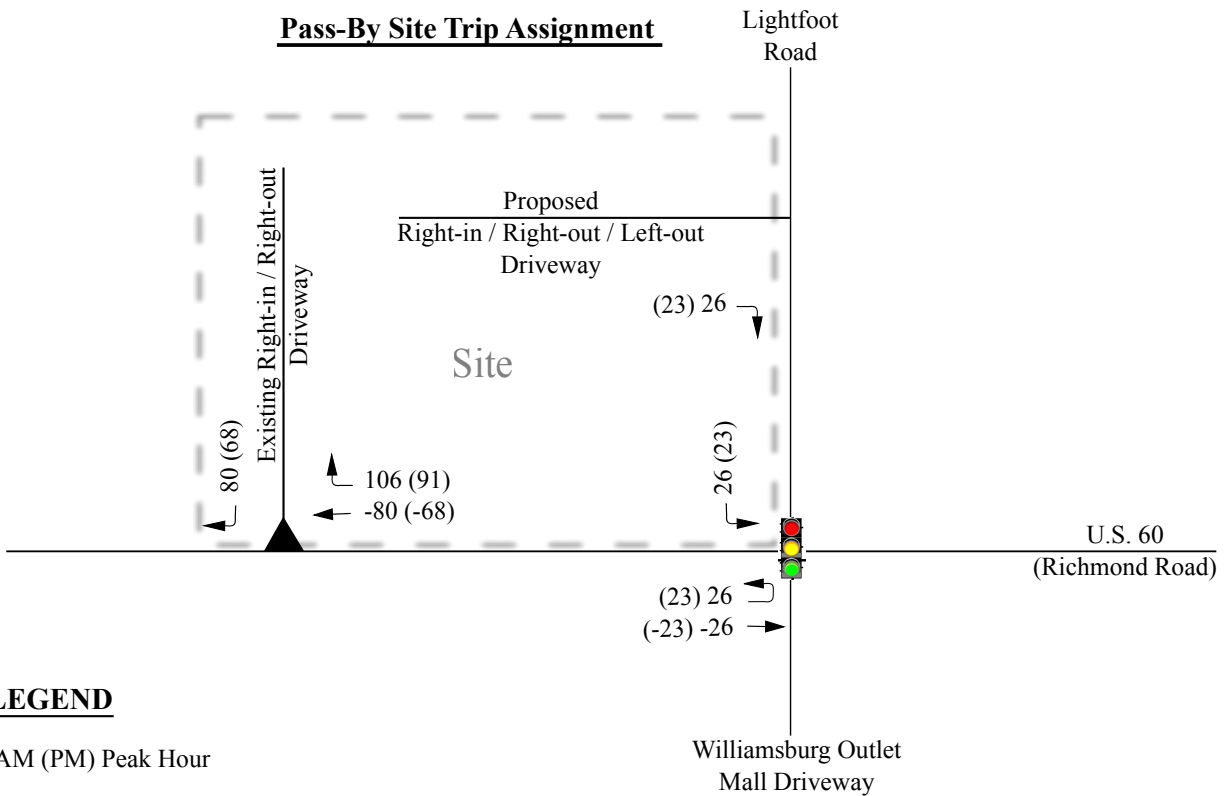
Figure 10



### Primary Site Trip Assignment



### Pass-By Site Trip Assignment



### LEGEND

X (Y) AM (PM) Peak Hour



Lightfoot Road C-Store  
York County and James City County,  
Virginia

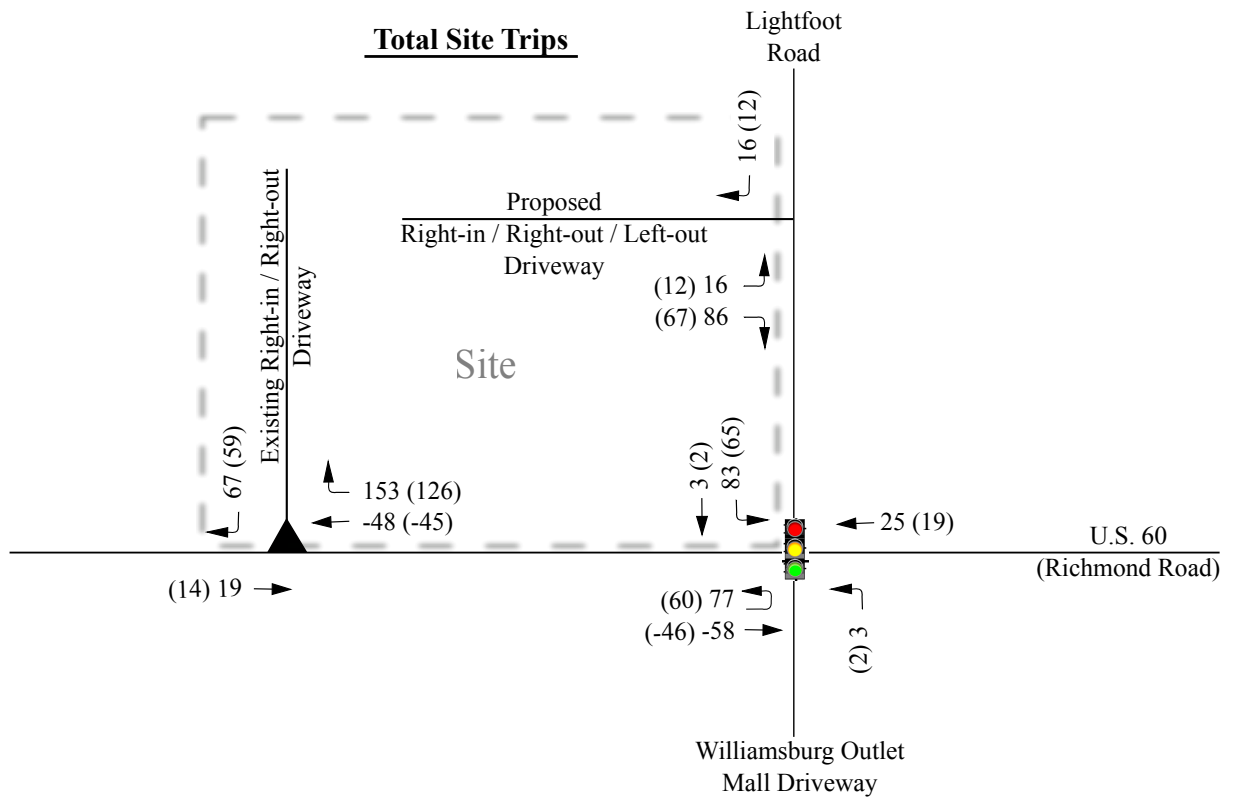
Primary and Pass-By  
Site Trip Assignment

Scale: Not to Scale

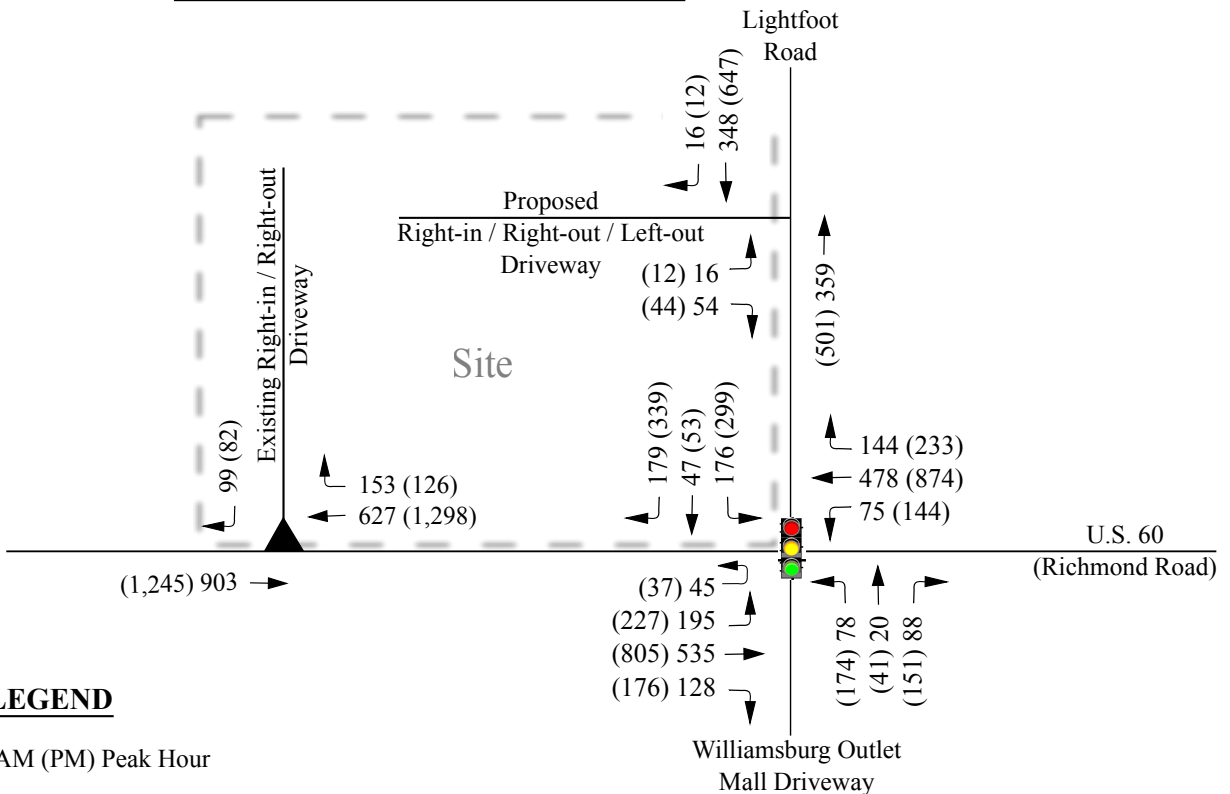
Figure 11



### Total Site Trips



### Build (2020) Peak Hour Traffic Volumes



### LEGEND

X (Y) AM (PM) Peak Hour



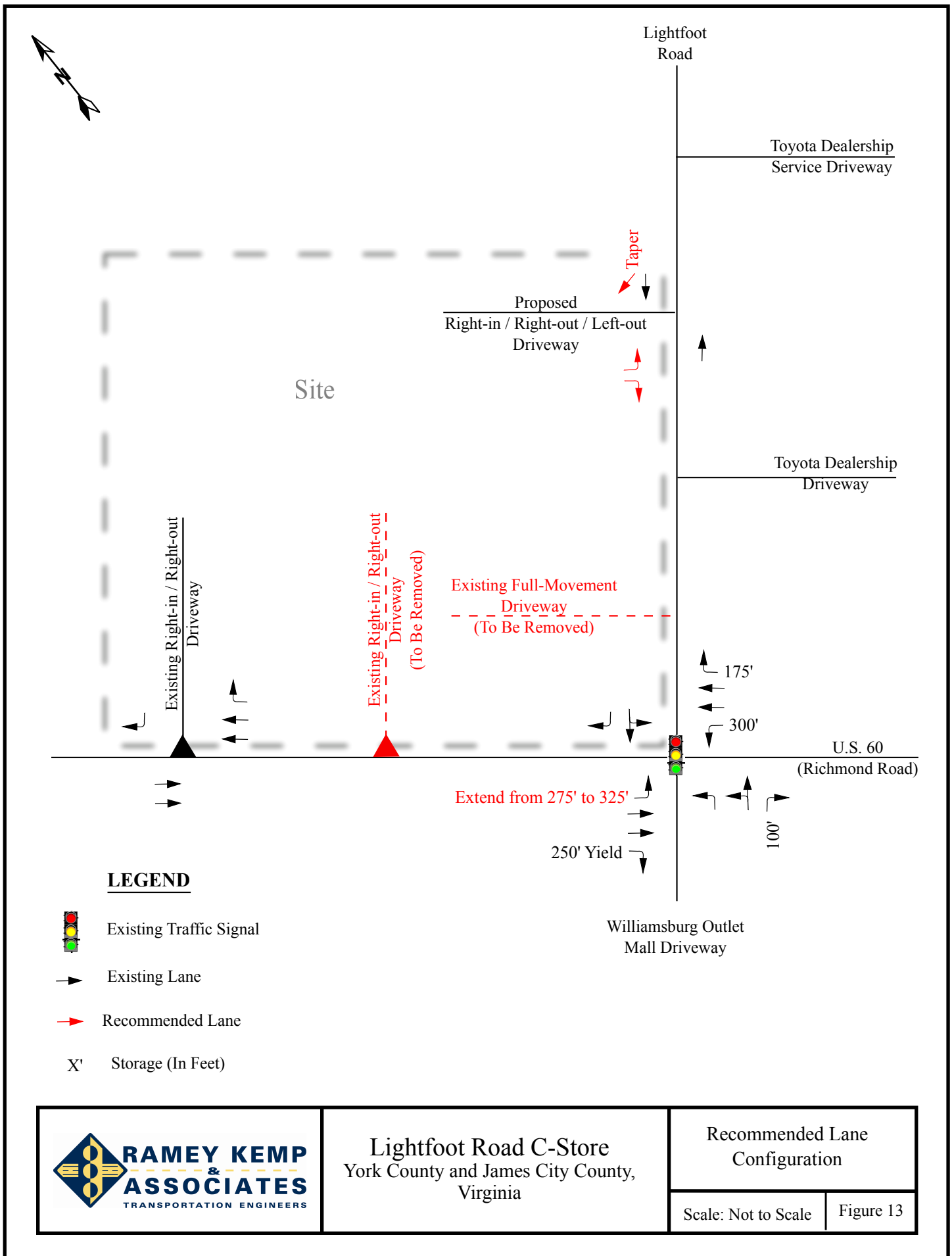
Lightfoot Road C-Store  
York County and James City County,  
Virginia

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

Scale: Not to Scale

Figure 12







### LEGEND

X' Intersection Spacing (In Feet)



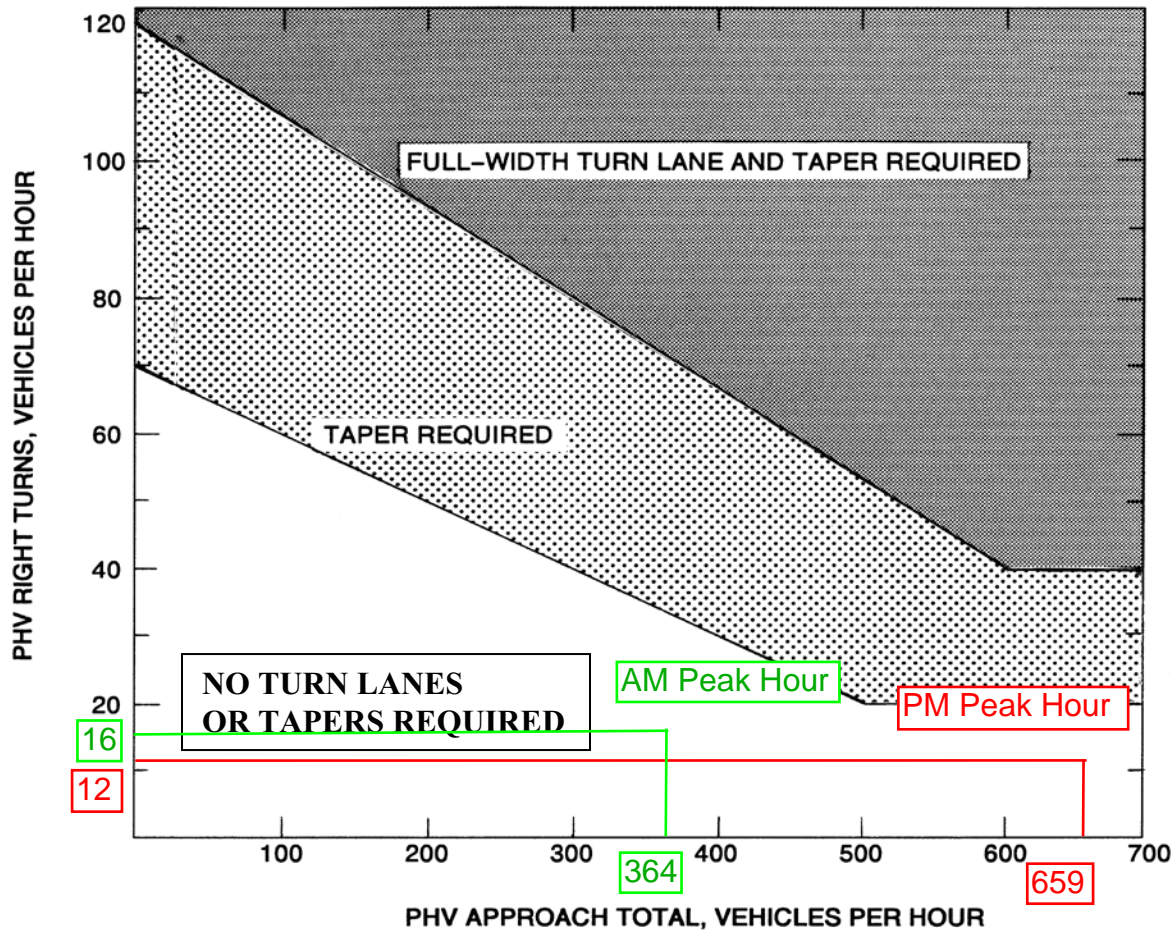
Lightfoot Road C-Store  
York County and James City County,  
Virginia

1/31/2007 Aerial of Corridor

Scale: Not to Scale

Figure 14





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)**

p: 919-829-0328 f: 919.833-0034

File Name : US60@Lightfoot

Site Code :

Start Date : 10/20/2016

Page No : 1

**Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians**

	US 60 (Richmond Road) Southbound				Lightfoot Road Westbound				US 60 (Richmond Road) Northbound				Lightfoot Road Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	33	151	47	0	35	20	24	0	10	118	21	0	5	1	8	0	0	473	473
07:15 AM	27	140	13	0	15	9	25	0	11	138	24	0	6	3	8	0	0	419	419
07:30 AM	35	152	18	0	32	8	33	0	6	81	28	0	7	5	15	0	0	420	420
07:45 AM	51	160	9	1	24	9	38	0	7	112	31	0	14	7	5	0	1	467	468
Total	146	603	87	1	106	46	120	0	34	449	104	0	32	16	36	0	1	1779	1780
08:00 AM	40	144	13	0	20	8	25	2	9	109	31	0	9	5	10	0	2	423	425
08:15 AM	50	132	5	0	25	8	39	0	3	113	38	0	7	4	9	0	0	433	433
08:30 AM	53	153	16	0	27	10	44	0	5	105	19	0	9	3	8	0	0	452	452
08:45 AM	49	146	20	0	45	11	45	0	7	140	43	0	11	8	9	0	0	534	534
Total	192	575	54	0	117	37	153	2	24	467	131	0	36	20	36	0	2	1842	1844

\*\*\* BREAK \*\*\*

[illegible]

# Peggy Malone & Associates

(888) 247-8602

File Name : 1-US 60 and Exxon Driveways AM  
 Site Code : 00000000  
 Start Date : 6/12/2018  
 Page No : 1

Groups Printed- All Vehicles (no classification)

	US 60 Southbound					fake approach Westbound					US 60 Northbound					Exxon (N) Driveway Southwestbound					
Start Time	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Right	Left	Peds	App. Total	Right	Bear Right	Thru	Peds	App. Total	Hard Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	3	0	0	0	3	6
07:15 AM	0	0	0	0	0	0	1	0	0	1	0	3	0	0	3	2	0	0	0	2	6
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
Total	0	0	0	0	0	0	2	0	0	2	2	6	0	0	8	7	0	0	0	7	17
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	4	0	0	0	4	7
08:15 AM	0	0	0	0	0	0	0	0	0	0	3	4	0	0	7	7	0	0	0	7	14
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4	0	0	0	4	6
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	3	0	0	0	3	7
Total	0	0	0	0	0	0	0	0	0	0	4	12	0	0	16	18	0	0	0	18	34
Grand Total	0	0	0	0	0	0	2	0	0	2	6	18	0	0	24	25	0	0	0	25	51
Apprch %	0	0	0	0		0	100	0	0		25	75	0	0		100	0	0	0		
Total %	0	0	0	0	0	0	3.9	0	0	3.9	11.8	35.3	0	0	47.1	49	0	0	0	49	

	US 60 Southbound					fake approach Westbound					US 60 Northbound					Exxon (N) Driveway Southwestbound					
Start Time	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Right	Left	Peds	App. Total	Right	Bear Right	Thru	Peds	App. Total	Hard Right	Bear Left	Hard Left	Peds	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	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	4	0	0	0	4	7
08:15 AM	0	0	0	0	0	0	0	0	0	0	3	4	0	0	7	7	0	0	0	7	14
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4	0	0	0	4	6
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	3	0	0	0	3	7
Total Volume	0	0	0	0	0	0	0	0	0	0	4	12	0	0	16	18	0	0	0	18	34
% App. Total	0	0	0	0		0	0	0	0		25	75	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.333	.750	.000	.000	.571	.643	.000	.000	.000	.643	.607

# Peggy Malone & Associates

(888) 247-8602

File Name : 1-US 60 and Exxon Driveways PM

Site Code : 00000000

Start Date : 6/12/2018

Page No : 1

Groups Printed- All Vehicles (no classification)

	US 60 Southbound				fake approach Westbound				US 60 Northbound				Exxon (N) Driveway Southwestbound				
Start Time	Thru	Left	Hard Left	App. Total	Hard Right	Right	Left	App. Total	Right	Bear Right	Thru	App. Total	Hard Right	Bear Left	Hard Left	App. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	5	0	5	5	0	0	5	11
04:15 PM	0	0	0	0	0	1	0	1	1	3	0	4	8	0	0	8	13
04:30 PM	0	0	0	0	0	0	0	0	1	3	0	4	5	0	0	5	9
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	2	3
Total	0	0	0	0	0	2	0	2	2	12	0	14	20	0	0	20	36
05:00 PM	0	0	0	0	0	2	0	2	0	3	0	3	7	0	0	7	12
05:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	6	0	0	6	8
05:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	2	0	0	2	4
05:45 PM	0	0	0	0	0	2	0	2	0	1	0	1	4	0	0	4	7
Total	0	0	0	0	0	4	0	4	0	8	0	8	19	0	0	19	31
Grand Total	0	0	0	0	0	6	0	6	2	20	0	22	39	0	0	39	67
Apprch %	0	0	0		0	100	0		9.1	90.9	0		100	0	0		
Total %	0	0	0	0	0	9	0	9	3	29.9	0	32.8	58.2	0	0	58.2	

	US 60 Southbound				fake approach Westbound				US 60 Northbound				Exxon (N) Driveway Southwestbound				
Start Time	Thru	Left	Hard Left	App. Total	Hard Right	Right	Left	App. Total	Right	Bear Right	Thru	App. Total	Hard Right	Bear Left	Hard 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 04:15 PM																	
04:15 PM	0	0	0	0	0	1	0	1	1	3	0	4	8	0	0	8	13
04:30 PM	0	0	0	0	0	0	0	0	1	3	0	4	5	0	0	5	9
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	2	3
05:00 PM	0	0	0	0	0	2	0	2	0	3	0	3	7	0	0	7	12
Total Volume	0	0	0	0	0	3	0	3	2	10	0	12	22	0	0	22	37
% App. Total	0	0	0		0	100	0		16.7	83.3	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.500	.833	.000	.750	.688	.000	.000	.688	.712

# Peggy Malone & Associates

(888) 247-8602

File Name : 2-Exxon and US 60 AM  
 Site Code :  
 Start Date : 6/12/2018  
 Page No : 1

## Groups Printed- All Vehicles (no classification)

	Exxon Southbound					Lightfoot Westbound				Nissan Northbound					Lightfoot Eastbound				
Start Time	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	3	0	3	4	1	0	5	0	0	0	0	0	1	5	0	6	14
07:15 AM	2	0	7	0	9	2	2	0	4	0	0	0	0	0	2	2	0	4	17
07:30 AM	2	0	1	0	3	1	0	0	1	1	0	1	0	2	1	1	0	2	8
07:45 AM	1	0	1	0	2	1	3	0	4	0	0	0	0	0	2	2	0	4	10
Total	5	0	12	0	17	8	6	0	14	1	0	1	0	2	6	10	0	16	49
08:00 AM	1	0	1	0	2	5	0	0	5	0	0	0	0	0	1	2	0	3	10
08:15 AM	0	0	1	1	2	2	1	0	3	1	0	0	0	1	0	2	0	2	8
08:30 AM	3	0	4	2	9	3	2	0	5	3	0	0	0	3	1	0	0	1	18
08:45 AM	5	0	1	0	6	2	0	0	2	0	0	0	0	0	5	1	0	6	14
Total	9	0	7	3	19	12	3	0	15	4	0	0	0	4	7	5	0	12	50
Grand Total	14	0	19	3	36	20	9	0	29	5	0	1	0	6	13	15	0	28	99
Apprch %	38.9	0	52.8	8.3		69	31	0		83.3	0	16.7	0		46.4	53.6	0		
Total %	14.1	0	19.2	3	36.4	20.2	9.1	0	29.3	5.1	0	1	0	6.1	13.1	15.2	0	28.3	

	Exxon Southbound					Lightfoot Westbound				Nissan Northbound					Lightfoot Eastbound				
Start Time	Right	Thru	Left	App. Total		Right	Left	App. Total		Right	Thru	Left	App. Total		Right	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 07:00 AM																			
07:00 AM	0	0	3	3		4	1	5		0	0	0	0		1	5	6		14
07:15 AM	2	0	7	9		2	2	4		0	0	0	0		2	2	4		17
07:30 AM	2	0	1	3		1	0	1		1	0	1	2		1	1	2		8
07:45 AM	1	0	1	2		1	3	4		0	0	0	0		2	2	4		10
Total Volume	5	0	12	17		8	6	14		1	0	1	2		6	10	16		49
% App. Total	29.4	0	70.6			57.1	42.9			50	0	50			37.5	62.5			
PHF	.625	.000	.429	.472		.500	.500	.700		.250	.000	.250	.250		.750	.500	.667		.721

# Peggy Malone & Associates

(888) 247-8602

File Name : 2-Exxon and US 60 PM  
 Site Code :  
 Start Date : 6/12/2018  
 Page No : 1

## Groups Printed- All Vehicles (no classification)

	Exxon Southbound					Lightfoot Westbound				Nissan Northbound					Lightfoot Eastbound				
Start Time	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	4	2	0	6	0	0	5	0	5	1	0	0	1	12
04:15 PM	1	0	2	0	3	7	0	0	7	0	0	0	0	0	3	0	0	3	13
04:30 PM	0	0	0	0	0	3	2	0	5	2	0	2	0	4	2	1	0	3	12
04:45 PM	3	0	2	0	5	2	1	0	3	0	0	0	0	0	0	0	0	0	8
Total	4	0	4	0	8	16	5	0	21	2	0	7	0	9	6	1	0	7	45
05:00 PM	0	0	0	0	0	8	2	0	10	7	1	0	0	8	1	0	0	1	19
05:15 PM	0	1	2	0	3	5	1	0	6	8	1	1	0	10	2	0	0	2	21
05:30 PM	0	0	2	0	2	5	1	0	6	3	0	4	0	7	1	0	0	1	16
05:45 PM	2	0	0	0	2	4	0	0	4	0	0	0	0	0	1	2	0	3	9
Total	2	1	4	0	7	22	4	0	26	18	2	5	0	25	5	2	0	7	65
Grand Total	6	1	8	0	15	38	9	0	47	20	2	12	0	34	11	3	0	14	110
Apprch %	40	6.7	53.3	0		80.9	19.1	0		58.8	5.9	35.3	0		78.6	21.4	0		
Total %	5.5	0.9	7.3	0	13.6	34.5	8.2	0	42.7	18.2	1.8	10.9	0	30.9	10	2.7	0	12.7	


























	Exxon Southbound				Lightfoot Westbound			Nissan Northbound				Lightfoot Eastbound			
Start Time	Right	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	Left	App. Total	Right	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	0	0	0	0	8	2	10	7	1	0	8	1	0	1	19
05:15 PM	0	1	2	3	5	1	6	8	1	1	10	2	0	2	21
05:30 PM	0	0	2	2	5	1	6	3	0	4	7	1	0	1	16
05:45 PM	2	0	0	2	4	0	4	0	0	0	0	1	2	3	9
Total Volume	2	1	4	7	22	4	26	18	2	5	25	5	2	7	65
% App. Total	28.6	14.3	57.1		84.6	15.4		72	8	20		71.4	28.6		
PHF	.250	.250	.500	.583	.688	.500	.650	.563	.500	.313	.625	.625	.250	.583	.774



Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60

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)	196	587	55	24	476	134	37	20	37	119	38	156
Future Volume (vph)	196	587	55	24	476	134	37	20	37	119	38	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	300		175	0		100	0		0
Storage Lanes	1		1	1		1	1		1	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1741	1583	0	1794	1583
Flt Permitted	0.950			0.950			0.950	0.984			0.963	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1741	1583	0	1794	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			208			149			181
Link Speed (mph)		45			45			25			45	
Link Distance (ft)		182			666			417			201	
Travel Time (s)		2.8			10.1			11.4			3.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Shared Lane Traffic (%)							25%					
Lane Group Flow (vph)	228	683	64	28	553	156	32	34	43	0	182	181
Turn Type	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			Free			3			4
Detector Phase	5	2	2	1	6		3	3	3	4	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	20.0	45.0	45.0	19.0	44.0		20.0	20.0	20.0	26.0	26.0	26.0
Total Split (%)	18.2%	40.9%	40.9%	17.3%	40.0%		18.2%	18.2%	18.2%	23.6%	23.6%	23.6%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)	-2.0	-2.0	-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		4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Act Effect Green (s)	21.6	63.8	63.8	9.3	46.7	110.0	9.7	9.7	9.7		18.3	18.3
Actuated g/C Ratio	0.20	0.58	0.58	0.08	0.42	1.00	0.09	0.09	0.09		0.17	0.17
v/c Ratio	0.66	0.33	0.07	0.19	0.37	0.10	0.22	0.22	0.16		0.61	0.44
Control Delay	50.1	15.8	0.1	49.1	25.1	0.1	49.4	49.4	1.2		50.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	50.1	15.8	0.1	49.1	25.1	0.1	49.4	49.4	1.2		50.7	8.9
LOS	D	B	A	D	C	A	D	D	A		D	A
Approach Delay		22.8			20.7			30.4			29.9	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	147	145	0	19	146	0	22	24	0		120	0
Queue Length 95th (ft)	219	218	0	45	207	0	51	53	0		173	49
Internal Link Dist (ft)		102			586			337			121	
Turn Bay Length (ft)				300		175			100			
Base Capacity (vph)	347	2051	980	241	1550	1583	244	253	357		365	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		0	0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

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	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.66	0.33	0.07	0.12	0.36	0.10	0.13	0.13	0.12		0.50	0.39

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 23.6

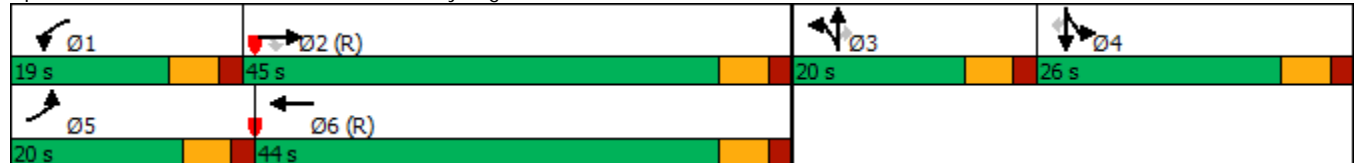
Intersection Capacity Utilization 49.3%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service A

Splits and Phases: 1: Commercial Driveway /Lightfoot Road & U.S. 60








Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & Full-Movement Driveway

Existing (2018) 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	7	9	5	345	304	12
Future Vol, veh/h	7	9	5	345	304	12
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	0	-	-	-	50
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	8	10	5	375	330	13

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	715	330	343
Stage 1	330	-	-
Stage 2	385	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	397	712	1216
Stage 1	728	-	-
Stage 2	688	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	395	712	1216
Mov Cap-2 Maneuver	395	-	-
Stage 1	724	-	-
Stage 2	688	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1216	-	395	712	-	-
HCM Lane V/C Ratio	0.004	-	0.019	0.014	-	-
HCM Control Delay (s)	8	0	14.3	10.1	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

Existing (2018) Conditions  
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	838	653	12	0	18
Future Vol, veh/h	0	838	653	12	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
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	911	710	13	0	20

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



























Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	641
HCM Lane V/C Ratio	-	-	-	0.031
HCM Control Delay (s)	-	-	-	10.8
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60






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)	222	865	71	61	879	205	77	40	60	248	48	322
Future Volume (vph)	222	865	71	61	879	205	77	40	60	248	48	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	300		175	0		100	0		0
Storage Lanes	1		1	1		1	1		1	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1741	1583	0	1788	1583
Flt Permitted	0.950			0.950			0.950	0.984			0.960	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1741	1583	0	1788	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			208			149			346
Link Speed (mph)		45			45			25			45	
Link Distance (ft)		182			666			417			201	
Travel Time (s)		2.8			10.1			11.4			3.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)							25%					
Lane Group Flow (vph)	239	930	76	66	945	220	62	64	65	0	319	346
Turn Type	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			Free			3			4
Detector Phase	5	2	2	1	6		3	3	3	4	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	20.0	45.0	45.0	19.0	44.0		20.0	20.0	20.0	26.0	26.0	26.0
Total Split (%)	18.2%	40.9%	40.9%	17.3%	40.0%		18.2%	18.2%	18.2%	23.6%	23.6%	23.6%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)	-2.0	-2.0	-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		4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Act Effect Green (s)	17.7	51.6	51.6	11.4	43.0	110.0	11.4	11.4	11.4		24.3	24.3
Actuated g/C Ratio	0.16	0.47	0.47	0.10	0.39	1.00	0.10	0.10	0.10		0.22	0.22
v/c Ratio	0.84	0.56	0.09	0.36	0.68	0.14	0.36	0.36	0.22		0.81	0.56
Control Delay	71.4	25.7	0.2	50.6	32.1	0.2	50.7	50.5	1.7		57.8	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	71.4	25.7	0.2	50.6	32.1	0.2	50.7	50.5	1.7		57.8	7.8
LOS	E	C	A	D	C	A	D	D	A		E	A
Approach Delay		32.9			27.4			33.9			31.8	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	169	275	0	44	303	0	43	45	0		208	0
Queue Length 95th (ft)	#320	365	0	85	378	0	85	87	0		#371	78
Internal Link Dist (ft)		102			586			337			121	
Turn Bay Length (ft)				300		175			100			
Base Capacity (vph)	284	1660	821	241	1406	1583	244	253	357		397	621
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		0	0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

Existing (2018) Conditions  
 Timing Plan: PM Peak Hour

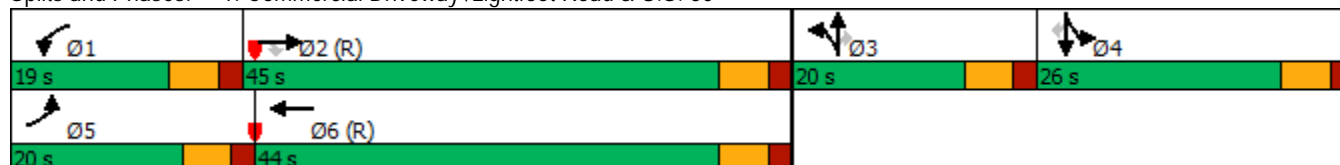
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.84	0.56	0.09	0.27	0.67	0.14	0.25	0.25	0.18		0.80	0.56

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 30.7  
 Intersection Capacity Utilization 69.5%  
 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: Commercial Driveway /Lightfoot Road & U.S. 60



Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & Full-Movement Driveway

Existing (2018) Conditions  
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	3	1	466	615	18
Future Vol, veh/h	4	3	1	466	615	18
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	0	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	100	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	3	1	507	668	20

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1177	668	688	0	-	0
Stage 1	668	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	211	458	906	-	-	-
Stage 1	510	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	211	458	906	-	-	-
Mov Cap-2 Maneuver	211	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	906	-	211	458	-	-
HCM Lane V/C Ratio	0.001	-	0.021	0.007	-	-
HCM Control Delay (s)	9	0	22.4	12.9	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

Existing (2018) Conditions  
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.1

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations 

Traffic Vol, veh/h 0 1158 1270 9 0 20

Future Vol, veh/h 0 1158 1270 9 0 20

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length - - - 0 - 0

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 1259 1380 10 0 22

Major/Minor Major1 Major2 Minor2

Conflicting Flow All - 0 - 0 - 690

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 - - - 0 388

Stage 1 0 - - - 0 -

Stage 2 0 - - - 0 -

Platoon blocked, % - - - - -

Mov Cap-1 Maneuver - - - - - 388

Mov Cap-2 Maneuver - - - - -

Stage 1 - - - - -

Stage 2 - - - - -

Approach EB WB SB

HCM Control Delay, s 0 0 14.8

HCM LOS B

Minor Lane/Major Mvmt EBT WBT WBR SBLn1

Capacity (veh/h) - - - 388

HCM Lane V/C Ratio - - - 0.056

HCM Control Delay (s) - - - 14.8

HCM Lane LOS - - - B



























HCM 95th %tile Q(veh) - - - 0.2



Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60

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)	200	561	128	75	469	144	75	20	88	134	44	179
Future Volume (vph)	200	561	128	75	469	144	75	20	88	134	44	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	300		175	0		100	0		0
Storage Lanes	1		1	1		1	1		1	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1720	1583	0	1796	1583
Flt Permitted	0.950			0.950			0.950	0.972			0.964	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1720	1583	0	1796	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			268			208			208
Link Speed (mph)		45			45			25			45	
Link Distance (ft)		182			666			417			201	
Travel Time (s)		2.8			10.1			11.4			3.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Shared Lane Traffic (%)							37%					
Lane Group Flow (vph)	233	652	149	87	545	167	55	55	102	0	207	208
Turn Type	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			Free			3			4
Detector Phase	5	2	2	1	6		3	3	3	4	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	31.0	48.0	48.0	17.0	34.0		17.0	17.0	17.0	28.0	28.0	28.0
Total Split (%)	28.2%	43.6%	43.6%	15.5%	30.9%		15.5%	15.5%	15.5%	25.5%	25.5%	25.5%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)	-2.0	-2.0	-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		4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Act Effect Green (s)	21.4	54.5	54.5	11.9	42.5	110.0	10.7	10.7	10.7		19.4	19.4
Actuated g/C Ratio	0.19	0.50	0.50	0.11	0.39	1.00	0.10	0.10	0.10		0.18	0.18
v/c Ratio	0.68	0.37	0.17	0.45	0.40	0.11	0.34	0.33	0.30		0.66	0.46
Control Delay	50.8	20.3	4.0	53.4	27.9	0.1	51.3	51.0	2.2		51.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	50.8	20.3	4.0	53.4	27.9	0.1	51.3	51.0	2.2		51.7	8.6
LOS	D	C	A	D	C	A	D	D	A		D	A
Approach Delay		24.8			24.9			27.6			30.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	153	156	0	58	147	0	38	38	0		137	0
Queue Length 95th (ft)	212	214	34	104	218	0	76	76	0		195	52
Internal Link Dist (ft)		102			586			337			121	
Turn Bay Length (ft)				300		175			100			
Base Capacity (vph)	434	1752	859	213	1367	1583	198	203	370		391	508
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		0	0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

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	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.54	0.37	0.17	0.41	0.40	0.11	0.28	0.27	0.28		0.53	0.41

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 26.0

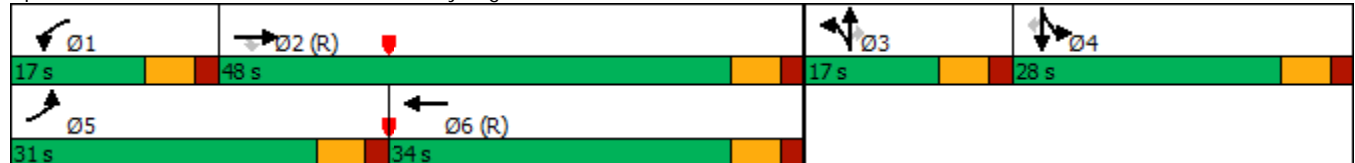
Intersection Capacity Utilization 50.4%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service A






Splits and Phases: 1: Commercial Driveway /Lightfoot Road & U.S. 60



Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & Full-Movement Driveway

No-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	7	9	5	359	348	12
Future Vol, veh/h	7	9	5	359	348	12
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	0	-	-	-	50
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	8	10	5	390	378	13

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	778	378	391	0	-	0
Stage 1	378	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3,518	3,318	2,218	-	-	-
Pot Cap-1 Maneuver	365	669	1168	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	363	669	1168	-	-	-
Mov Cap-2 Maneuver	363	-	-	-	-	-
Stage 1	690	-	-	-	-	-
Stage 2	677	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1168	-	363	669	-	-
HCM Lane V/C Ratio	0.005	-	0.021	0.015	-	-
HCM Control Delay (s)	8.1	0	15.1	10.5	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

No-Build (2020) Conditions

Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	889	707	12	0	18
Future Vol, veh/h	0	889	707	12	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
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	966	768	13	0	20

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



























Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	614
HCM Lane V/C Ratio	-	-	-	0.032
HCM Control Delay (s)	-	-	-	11.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60

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)	228	828	176	144	865	233	172	41	151	260	51	339
Future Volume (vph)	228	828	176	144	865	233	172	41	151	260	51	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	300		175	0		100	0		0
Storage Lanes	1		1	1		1	1		1	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1717	1583	0	1788	1583
Flt Permitted	0.950			0.950			0.950	0.970			0.960	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1717	1583	0	1788	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			189			208			162			300
Link Speed (mph)		45			45			25			45	
Link Distance (ft)		182			666			417			201	
Travel Time (s)		2.8			10.1			11.4			3.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)							39%					
Lane Group Flow (vph)	245	890	189	155	930	251	113	116	162	0	335	365
Turn Type	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			Free			3			4
Detector Phase	5	2	2	1	6		3	3	3	4	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	21.0	43.0	43.0	20.0	42.0		20.0	20.0	20.0	27.0	27.0	27.0
Total Split (%)	19.1%	39.1%	39.1%	18.2%	38.2%		18.2%	18.2%	18.2%	24.5%	24.5%	24.5%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)	-2.0	-2.0	-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		4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Act Effect Green (s)	17.5	41.7	41.7	14.8	39.0	110.0	13.8	13.8	13.8		23.7	23.7
Actuated g/C Ratio	0.16	0.38	0.38	0.13	0.35	1.00	0.13	0.13	0.13		0.22	0.22
v/c Ratio	0.87	0.66	0.26	0.65	0.74	0.16	0.54	0.54	0.48		0.87	0.63
Control Delay	75.3	32.1	4.6	58.5	35.9	0.2	54.2	54.1	11.6		65.4	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	75.3	32.1	4.6	58.5	35.9	0.2	54.2	54.1	11.6		65.4	13.8
LOS	E	C	A	E	D	A	D	D	B		E	B
Approach Delay		36.1			31.8			36.5			38.5	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	172	282	0	104	304	0	78	81	0		228	38
Queue Length 95th (ft)	#319	356	47	174	382	0	140	141	60		#396	138
Internal Link Dist (ft)		102			586			337			121	
Turn Bay Length (ft)				300		175			100			
Base Capacity (vph)	281	1340	717	257	1265	1583	244	249	368		388	579
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		0	0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

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	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.87	0.66	0.26	0.60	0.74	0.16	0.46	0.47	0.44		0.86	0.63

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 35.1

Intersection LOS: D

Intersection Capacity Utilization 70.3%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Commercial Driveway /Lightfoot Road & U.S. 60








Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & Full-Movement Driveway

No-Build (2020) Conditions

Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	3	1	501	647	18
Future Vol, veh/h	4	3	1	501	647	18
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	0	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	100	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	3	1	545	703	20

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1250	703	723	0	-	0
Stage 1	703	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	191	438	879	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	438	879	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	879	-	191	438	-	-
HCM Lane V/C Ratio	0.001	-	0.023	0.007	-	-
HCM Control Delay (s)	9.1	0	24.3	13.3	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-



Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

No-Build (2020) Conditions

Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	1232	1368	9	0	20
Future Vol, veh/h	0	1232	1368	9	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
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	1339	1487	10	0	22

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
























Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	357
HCM Lane V/C Ratio	-	-	-	0.061
HCM Control Delay (s)	-	-	-	15.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60

Build (2020) Conditions

Timing Plan: AM Peak Hour

												
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	45	195	535	128	75	478	144	78	20	88	176	47
Future Volume (vph)	45	195	535	128	75	478	144	78	20	88	176	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	300		175	0		100	0	
Storage Lanes		1		1	1		1	1		1	0	
Taper Length (ft)		100			100			100			100	
Satd. Flow (prot)	0	1770	3539	1583	1770	3539	1583	1681	1718	1583	0	1792
Flt Permitted		0.950			0.950			0.950	0.971			0.962
Satd. Flow (perm)	0	1770	3539	1583	1770	3539	1583	1681	1718	1583	0	1792
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)				149			268			208		
Link Speed (mph)			45			45			25			45
Link Distance (ft)			321			666			417			402
Travel Time (s)			4.9			10.1			11.4			6.1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Shared Lane Traffic (%)								38%				
Lane Group Flow (vph)	0	279	622	149	87	556	167	56	58	102	0	260
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			Free			3		
Detector Phase	5	5	2	2	1	6		3	3	3	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0
Total Split (s)	32.0	32.0	49.0	49.0	15.0	32.0		16.0	16.0	16.0	30.0	30.0
Total Split (%)	29.1%	29.1%	44.5%	44.5%	13.6%	29.1%		14.5%	14.5%	14.5%	27.3%	27.3%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)		-2.0	-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		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Min	C-Min	None	C-Min		None	None	None	None	None
Act Effect Green (s)		23.7	52.9	52.9	10.9	37.6	110.0	10.5	10.5	10.5		22.2
Actuated g/C Ratio		0.22	0.48	0.48	0.10	0.34	1.00	0.10	0.10	0.10		0.20
v/c Ratio		0.73	0.37	0.18	0.50	0.46	0.11	0.35	0.36	0.30		0.72
Control Delay		51.7	20.7	3.9	57.1	32.0	0.1	52.2	52.3	2.3		52.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		51.7	20.7	3.9	57.1	32.0	0.1	52.2	52.3	2.3		52.2
LOS		D	C	A	E	C	A	D	D	A		D
Approach Delay			26.6			28.1			28.7			32.4
Approach LOS			C			C			C			C
Queue Length 50th (ft)		183	156	0	58	165	0	38	41	0		171
Queue Length 95th (ft)		251	201	34	107	229	0	77	81	0		239
Internal Link Dist (ft)			241			586			337			322
Turn Bay Length (ft)					300		175			100		
Base Capacity (vph)		450	1703	839	183	1210	1583	183	187	358		423
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0		0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60













Build (2020) Conditions  
 Timing Plan: AM Peak Hour

Lane Group	SBR
Land Configurations	7
Traffic Volume (vph)	179
Future Volume (vph)	179
Ideal Flow (vphpl)	1900
Storage Length (ft)	225
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	208
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.86
Shared Lane Traffic (%)	
Lane Group Flow (vph)	208
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	16.0
Total Split (s)	30.0
Total Split (%)	27.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	22.2
Actuated g/C Ratio	0.20
v/c Ratio	0.43
Control Delay	7.7
Queue Delay	0.0
Total Delay	7.7
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	51
Internal Link Dist (ft)	
Turn Bay Length (ft)	225
Base Capacity (vph)	533
Starvation Cap Reductn	0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

Build (2020) Conditions

Timing Plan: AM Peak Hour

												
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0		0
Reduced v/c Ratio		0.62	0.37	0.18	0.48	0.46	0.11	0.31	0.31	0.28		0.61

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 28.3

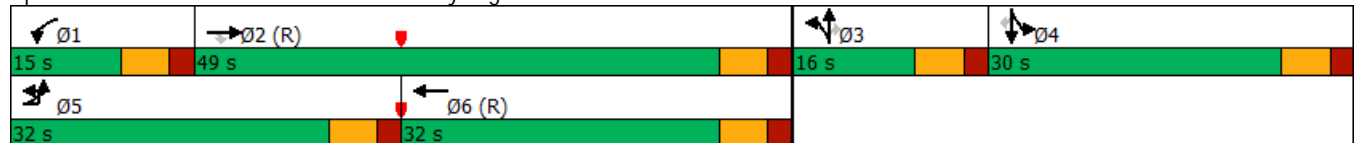
Intersection LOS: C

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Commercial Driveway /Lightfoot Road & U.S. 60





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Lane Group	SBR
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.39

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Intersection Summary

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Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & RI/RO/LO Driveway

Build (2020) Conditions  
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 1.5

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	16	86	0	359	348	16
Future Vol, veh/h	16	86	0	359	348	16
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	93	0	390	378	17

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	777	387	-	0	-	0
Stage 1	387	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	365	661	0	-	-	-
Stage 1	686	-	0	-	-	-
Stage 2	684	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	661	-	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	684	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt NBT EBLn1 EBLn2 SBT SBR

Capacity (veh/h)	-	365	661	-	-
HCM Lane V/C Ratio	-	0.048	0.141	-	-
HCM Control Delay (s)	-	15.4	11.3	-	-
HCM Lane LOS	-	C	B	-	-
HCM 95th %tile Q(veh)	-	0.1	0.5	-	-

Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

Build (2020) Conditions

Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	903	659	153	0	67
Future Vol, veh/h	0	903	659	153	0	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
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	982	716	166	0	73

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

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.4
HCM LOS			B
























Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	638
HCM Lane V/C Ratio	-	-	-	0.114
HCM Control Delay (s)	-	-	-	11.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4



Lightfoot Road C-Store - York County, VA  
1: Commercial Driveway /Lightfoot Road & U.S. 60

Build (2020) Conditions

Timing Plan: PM Peak Hour

												
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	227	805	176	144	874	233	174	41	151	299	53
Future Volume (vph)	37	227	805	176	144	874	233	174	41	151	299	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		325		0	300		175	0		100	0	
Storage Lanes		1		1	1		1	1		1	0	
Taper Length (ft)		100			100			100			100	
Satd. Flow (prot)	0	1770	3539	1583	1770	3539	1583	1681	1717	1583	0	1786
Flt Permitted		0.950			0.950			0.950	0.970			0.959
Satd. Flow (perm)	0	1770	3539	1583	1770	3539	1583	1681	1717	1583	0	1786
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)				189			208			162		
Link Speed (mph)			45			45			25			45
Link Distance (ft)			321			666			417			407
Travel Time (s)			4.9			10.1			11.4			6.2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)								39%				
Lane Group Flow (vph)	0	284	866	189	155	940	251	114	117	162	0	379
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Free	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			Free			3		
Detector Phase	5	5	2	2	1	6		3	3	3	4	4
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	5.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	16.0		16.0	16.0	16.0	16.0	16.0
Total Split (s)	27.0	27.0	42.0	42.0	21.0	36.0		20.0	20.0	20.0	27.0	27.0
Total Split (%)	24.5%	24.5%	38.2%	38.2%	19.1%	32.7%		18.2%	18.2%	18.2%	24.5%	24.5%
Yellow Time (s)	4.0	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	2.0
Lost Time Adjust (s)		-2.0	-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		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Min	C-Min	None	C-Min		None	None	None	None	None
Act Effect Green (s)		21.8	39.6	39.6	15.3	33.1	110.0	13.9	13.9	13.9		25.2
Actuated g/C Ratio		0.20	0.36	0.36	0.14	0.30	1.00	0.13	0.13	0.13		0.23
v/c Ratio		0.81	0.68	0.27	0.63	0.88	0.16	0.54	0.54	0.48		0.93
Control Delay		60.6	33.5	4.7	56.2	48.0	0.2	54.4	54.3	11.6		72.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		60.6	33.5	4.7	56.2	48.0	0.2	54.4	54.3	11.6		72.7
LOS		E	C	A	E	D	A	D	D	B		E
Approach Delay			35.2			40.0			36.7			45.1
Approach LOS			D			D			D			D
Queue Length 50th (ft)		190	275	0	103	337	0	80	82	0		266
Queue Length 95th (ft)		#315	350	47	172	#458	0	140	143	60		#470
Internal Link Dist (ft)			241			586			337			327
Turn Bay Length (ft)		325			300		175			100		
Base Capacity (vph)		370	1273	690	273	1066	1583	244	249	368		409
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0		0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

Build (2020) Conditions

Timing Plan: PM Peak Hour

Lane Group SBR

Land Configurations

Traffic Volume (vph) 339

Future Volume (vph) 339

Ideal Flow (vphpl) 1900

Storage Length (ft) 225

Storage Lanes 1

Taper Length (ft)

Satd. Flow (prot) 1583

Flt Permitted

Satd. Flow (perm) 1583

Right Turn on Red Yes

Satd. Flow (RTOR) 272

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Peak Hour Factor 0.93

Shared Lane Traffic (%)

Lane Group Flow (vph) 365

Turn Type Perm

Protected Phases

Permitted Phases 4

Detector Phase 4

Switch Phase

Minimum Initial (s) 5.0

Minimum Split (s) 16.0

Total Split (s) 27.0

Total Split (%) 24.5%

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s) -2.0

Total Lost Time (s) 4.0

Lead/Lag Lag

Lead-Lag Optimize? Yes

Recall Mode None

Act Effct Green (s) 25.2

Actuated g/C Ratio 0.23

v/c Ratio 0.64

Control Delay 16.4

Queue Delay 0.0

Total Delay 16.4

LOS B

Approach Delay

Approach LOS

Queue Length 50th (ft) 55

Queue Length 95th (ft) 163

Internal Link Dist (ft)

Turn Bay Length (ft) 225













Base Capacity (vph) 572

Starvation Cap Reductn 0

Lightfoot Road C-Store - York County, VA  
 1: Commercial Driveway /Lightfoot Road & U.S. 60

Build (2020) Conditions

Timing Plan: PM Peak Hour

												
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0		0
Reduced v/c Ratio		0.77	0.68	0.27	0.57	0.88	0.16	0.47	0.47	0.44		0.93

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 39.0

Intersection LOS: D

Intersection Capacity Utilization 79.0%



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: 1: Commercial Driveway /Lightfoot Road & U.S. 60

 Ø1	 Ø2 (R)	 Ø3	 Ø4
21 s	42 s	20 s	27 s
 Ø5	 Ø6 (R)		
27 s	36 s		



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Lane Group	SBR
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.64
Intersection Summary	

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Lightfoot Road C-Store - York County, VA  
2: Lightfoot Road & RI/RO/LO Driveway





Build (2020) Conditions

Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	12	67	0	501	647	12
Future Vol, veh/h	12	67	0	501	647	12
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	100	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	67	0	545	703	13

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	1255	710	-	0	-	0
Stage 1	710	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	189	434	0	-	-	-
Stage 1	487	-	0	-	-	-
Stage 2	581	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	189	434	-	-	-	-
Mov Cap-2 Maneuver	189	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	581	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	16.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt NBT EBLn1 EBLn2 SBT SBR

Capacity (veh/h)	-	189	434	-	-
HCM Lane V/C Ratio	-	0.069	0.154	-	-
HCM Control Delay (s)	-	25.5	14.8	-	-
HCM Lane LOS	-	D	B	-	-
HCM 95th %tile Q(veh)	-	0.2	0.5	-	-

Lightfoot Road C-Store - York County, VA  
3: U.S. 60 & RIRO West

Build (2020) Conditions  
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations 

Traffic Vol, veh/h 0 1245 1321 126 0 59

Future Vol, veh/h 0 1245 1321 126 0 59

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length - - - 0 - 0

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 1353 1436 137 0 64

Major/Minor Major1 Major2 Minor2

Conflicting Flow All - 0 - 0 - 718

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 - - - 0 371

Stage 1 0 - - - 0 -

Stage 2 0 - - - 0 -

Platoon blocked, % - - - - -

Mov Cap-1 Maneuver - - - - - 371

Mov Cap-2 Maneuver - - - - -

Stage 1 - - - - -

Stage 2 - - - - -

Approach EB WB SB

HCM Control Delay, s 0 0 16.7

HCM LOS C

Minor Lane/Major Mvmt EBT WBT WBR SBLn1

Capacity (veh/h) - - - 371

HCM Lane V/C Ratio - - - 0.173

HCM Control Delay (s) - - - 16.7

HCM Lane LOS - - - C

HCM 95th %tile Q(veh) - - - 0.6