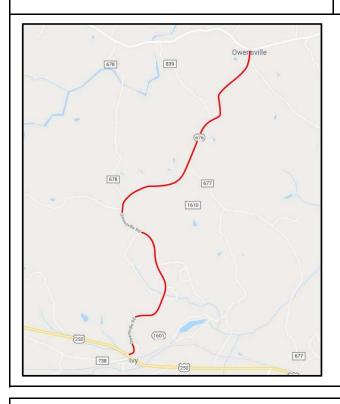
Through Truck Restriction Study

Owensville Road (Route 676 & Route 678)

County of Albemarle Date: September 19, 2018







Owensville Road (Route 676/Route 678)

Start: Garth Road (Route 614) **End:** US 250 (Ivy Road) Segment Length: 4.2 miles

Functional Classification: Major Collector

Purpose of Study

To determine if truck traffic should be restricted along Owensville Road based upon Virginia Commonwealth Transportation Board (CTB) Criteria.

Through Truck Route:

US 250 \leftrightarrow Owensville Rd \leftrightarrow Garth Rd \leftrightarrow Woodlands Rd \leftrightarrow Earlysville Rd \leftrightarrow Dickerson Rd \leftrightarrow Airport Rd \leftrightarrow US 29

Length: 15.0 Miles

Total Travel Time: 28 minutes Average Truck Speed: 32.0 mph

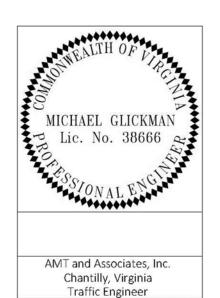


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- a. Raw Traffic Count Data
- b. Raw Crash Data

STUDY PURPOSE

A. Morton Thomas and Associates, Inc. (AMT) has prepared a *Through Truck Restriction Study* for Owensville Road (Route 635) located in Albemarle County, Virginia. Owensville Road is a north-south two-lane rural roadway (4.2 miles in length), classified as a Major Collector, that connects Garth Road (Route 614) to US 250 (Ivy Road). Currently, trucks utilize Owensville Road as part of a cut-through route to travel between US 29 and US 250. The purpose of this Study is to document the impacts of trucks traveling along Owensville Road and provide conclusions regarding the potential for implementing future restrictions based upon criteria set forth by the Virginia Commonwealth Transportation Board (CTB). According to the Code of Virginia § 46.2-809, "A through truck is defined as any truck or truck and trailer or semitrailer combination, except a pickup or panel truck, that travels from one point to another and having no origin or destination along the route(s) traveled".

The following maximum vehicle dimensions currently allowed on Owensville Road are based upon "<u>Virginia's Size, Weight and Equipment Requirements for Trucks Trailers and Towed Vehicles</u>, by the Virginia Department of Motor Vehicles:

Maximum Length

Truck - 40 feet excluding load

Semi-trailer- 53 feet

Twin Trailers - Not permitted

Tractor Semi-Trailer Combinations - No overall length limitations except where prohibited.

Combination of a towing vehicle and any manufactured home - 65 feet including load

Maximum Width

All Vehicles - 102 inches excluding mirror and any warning device installed on a school bus

Maximum Height

All Vehicles - 13 feet 6 inches

VIRGINIA COMMONWEALTH TRANSPORTATION BOARD (CTB) CRITERIA

The following criteria were adopted by the Virginia Commonwealth Transportation Board (CTB) on October 16, 2003 and included in: "Guidelines for Considering Requests to Restrict Through Trucks on Primary and Secondary Highways".

Criteria:

Travel by any class of vehicle should be restricted only upon demonstration that it will promote the health, safety and welfare of the citizens of the Commonwealth without creating an undue hardship on any users of the transportation network. The Virginia Department of Transportation will consider criteria 1 through 4 in reviewing a requested through truck restriction. The proposed restriction must meet both the first and second criteria in order to be approved:

- 1. Reasonable alternate routing is provided. The alternate route will be evaluated for traffic and safety related impacts. To be considered "reasonable", the alternate route(s) must be engineered to a standard sufficient for truck travel, and must be judged at least as appropriate for truck traffic as the requested truck restriction route. If an alternate route must be upgraded, the improvement shall be completed before the truck restriction can be implemented. The termini of the proposed restriction must be identical to the alternate routing to allow a time and distance comparison to be conducted between the two routings. Also, the alternate routing must not create an undue hardship for trucks in reaching their destination.
- 2. The character and/or frequency of the truck traffic on the route proposed for restriction is not compatible with the affected area. Evaluation will include safety issues, accident history, engineering of the roadway, vehicle composition, and other traffic engineering related issues.

In addition to meeting the first two criteria, the proposed restriction must meet <u>either</u> the third or the fourth criteria in order to be approved.

- 3. The roadway is residential in nature. Typically, the roadway will be judged to be residential if there are at least 12 dwellings combined on both sides within 150' of the existing or proposed roadway center line per 1,000 feet of roadway.
- 4. The roadway must be functionally classified as either a local or collector.

TRAFFIC COUNTS

Using mio-vision camera technology, AMT collected 48-hour (in 15-minute increments) turning movement counts at the intersections of Owensville Road (Route 676/Route 678) at Garth Road (Route 614) and Owensville Road at US 250 (Ivy Road) from March 14, 2018 (Wednesday) through March 15, 2018 (Thursday). The data was reduced to provide standard two (2) axle vehicles, long wheelbase box trucks and tractor trailers. The following summarizes the vehicle composition based upon the traffic count data collected along Owensville Road:

- Two-way ADT = 2,731 vpd north of Tilman Road / 3,398 vpd south of Tilman Road
- Total Trucks (Non-Pickup) = 93 vpd north of Tilman Road / 73 vpd south of Tilman Road

Raw traffic count data worksheets are provided in the **Appendix** section of this report.

CRASH DATA

Virginia Roads Open Data was utilized to compile the most recent five (5) years of historic crash data (2013-2017) along Owensville Road (Route 676 & Route 678), from Garth Road to US 250, in Albemarle County. Accordingly, the crash data was reviewed and documented for Years 2013-2017 to include the date, location, direction of travel, collision type, driver injury type and vehicle type. According to FHWA's methodology for calculating crash rates, Owensville Road maintains a crash rate of 157.02 crashes per 100 million vehiclemiles of travel north of Tilman Road and 229.15 million vehiclemiles of travel south of Tilman Road. The Culpeper District Average for 2-lane Rural Roads is 147.08. Crash Rate calculations are provided in the Appendix section of this Study. The following summarizes the crash data compiled between the Years 2013 and 2017:

Owensville Road – From south of Garth Road to north of US 250

- 32 total crashes occurred over the five (5) year period.
 - Vehicle Types (all vehicles involved): 25 Cars, 12 Pick-up Trucks/Vans/SUVs, 1 Truck, 2 Motorcycles
 - <u>Collision Types:</u> 23 Fixed Object, 3 Angle, 3 "Other", 2 Deer-Related 1 Rear-End, 1 Sideswipe, 1 Backed Into
 - <u>Drive Injury Types:</u> 27 Property Damage Only, 11 Non-Incapacitating Injury, 1 Non-Visible Injury

Garth Road at Owensville Road

- o 4 total crashes occurred over the five (5) year period.
 - Vehicle Types (all vehicles involved): 4 Cars, 4 Pick-up Trucks/Vans/SUVs
 - Collision Types: 2 Rear-End, 1 Angle, 1 Head-on
 - <u>Drive Injury Types:</u> 6 Property Damage Only, 1 Non-Incapacitating Injury, 1 Non-Visible Injury

• US 250 at Owensville Road

- o 9 total crashes occurred over the five (5) year period.
 - Vehicle Types (all vehicles involved): 10 Cars, 9 Pick-up Trucks/Vans/SUVs, 1 Motorcycle
 - Collision Types: 7 Rear-End, 2 Angle
 - Drive Injury Types: 19 Property Damage Only, 1 Non-Incapacitating Injury

Figure 1 shows the five-years of crash data (using Google Maps) from the intersection of Owensville Road & Garth Road to the intersection of the Owensville Road & US 250.

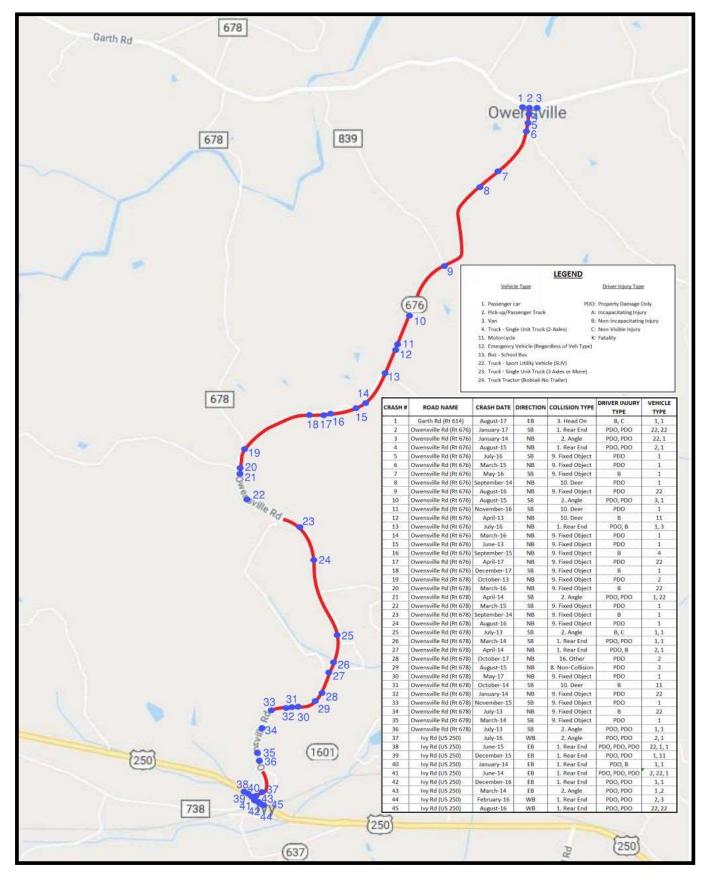


Figure 1: Five-Year Roadway Crash Data - Owensville Road (Route 676 & Route 678)

ROADWAY CHARACTERISTICS

Roadway Information

Owensville Road (Route 676/Route 678)

Segment Start: Garth Road (Route 614)

Segment End: US 250 (Ivy Road)

• Roadway Length: 4.2 Miles

VDOT Functional Classification: "Major Collector"

• Adjacent Land Uses: Residential, Private School (Owensville of Albemarle)

• Key Intersections: Garth Road (Route 614), Whippoorwill Road (Route 839), Old Ballard Road (Route 677), Decan Lane (Route 678), Tilman Road (Route 676) and Ivy Road (US 250).

Figure 2 provides photographs at various points along northbound and southbound Owensville Road.

Adjacent Residential Uses

Owensville Road provides direct access to one hundred and eight (108) single-family detached residential units. Per CTB's Criteria #3 described above, the roadway is determined to be "residential" if there are at least 12 dwelling units combined on both sides within 150' of the centerline per 1000' of roadway. **Table** 1 provides an inventory of the existing residential units located along Owensville Road.

Roadway Geometrics/ Compatibility

AMT referenced the "Geometric Design Standards for Rural Collector Road System (GS-3)" included on Page A-14 of VDOT's <u>Road Design Manual</u> (Issued January 2005 and Revised January 2018) to determine whether Owensville Road would be in compliance with VDOT's minimum geometric design standards. Based upon the information determined in the previous sections, the following criteria were applied to the standards provided in **Table 2**.

Roadway Classification: Rural Major Collector

Posted Speed: 40 mph

ADT: Varies - 2,731 vpd (north of Tilman Road) to 3,398 vpd (south of Tilman Road)

Terrain: Rolling

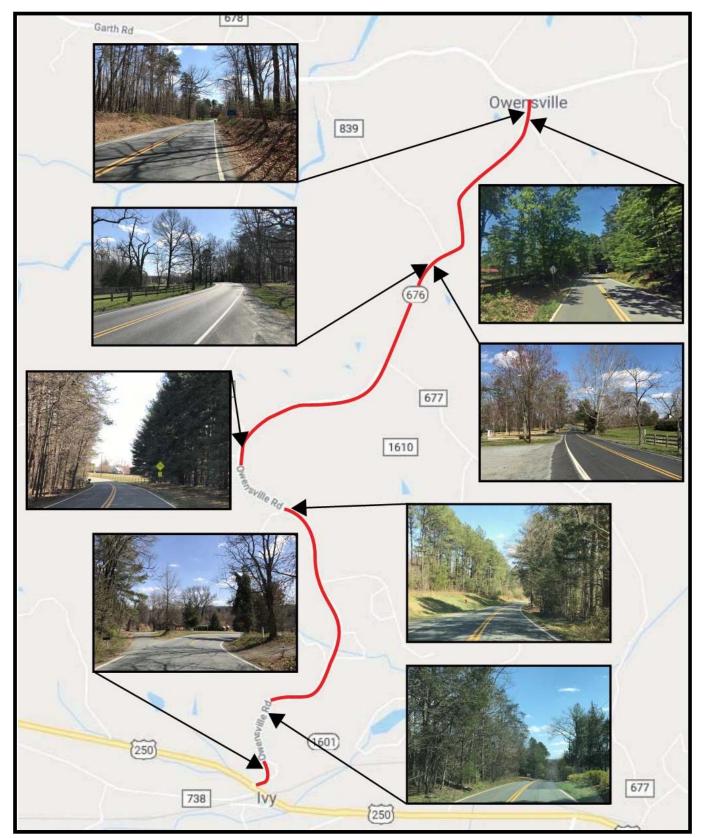


Figure 2: Photographs along Northbound and Southbound Owensville Road

Table 1 Owensville Road **Inventory of Existing Residential Units**

Roadway Segment	Inventory of Houses	Offset fro	m Centerline	Roadway Segment	Inventory of Houses	Offset from	n Centerline
per 1000'	North to South	West Side	East Side	per 1000'	North to South	West Side	East Side
	House #1		95'		House #55		120'
	House #2	115'			House #56		85'
	House #3		>150 '	11	House #57	145'	
1	House #4	50'			House #58	85'	
	House #5		>150 '		House #59		120'
	House #6		145'		Total within 150'	5 U	
	Total within 150'	41	Units		House #60	140'	1
	House #7	>150 '	Units				
2				12	House #61	<150'	. 4501
	House #8	>150 '	11.70.		House #62	:4501	>150 '
	Total within 150'		Units		House #63	<150'	<u> </u>
	House #9	>150 '			Total within 150'	10	Init
	House #10	>150 '			House #64		120'
	House #11	>150 '		13	House #65		145'
3	House #12	>150 '			House #66	145'	
3	House #13	>150 '			Total within 150'	3 U	nits
	House #14	>150 '			House #67		120'
	House #15	>150 '			House #68		120'
	House #16	65'			House #69		>150'
	Total within 150'		Unit	14	House #70	>150'	
	House #17	95'	- ·		House #71		>150'
	House #17	85'			House #71	95'	/130
4	House #19	>150 '			House #72	95	95'
4						4 U	
	House #20	>150 '			Total within 150'	4 0	
	House #21	>150 '			House #74		115'
	Total within 150'		Units	15	House #75	120'	
	House #22	115'			House #76	70'	
	House #23		100'		House #77		145'
	House #24	<150 '			Total within 150'	4 U	nits
5	House #25	<150 '			House #78		145'
	House #26	<150 '			House #79	145'	
	House #27	105'			House #80		>150'
	House #28	145'		16	House #81	145'	1 230
	Total within 150'		Units	15	House #82	145	>150'
	House #29	<150 '	1		House #83		>150'
	House #30	<130	>150 '		House #84	145'	7130
		4501	>150				
6	House #31	<150 '			Total within 150'	4 U	
	House #32	85'			House #85		115'
	House #33	90'			House #86	>150'	
	House #34	<150 '		17	House #87		140'
	Total within 150'	21	Units		House #88		105'
	House #35	110'			House #89	100'	
	House #36	<150 '			House #90		105'
	House #37		95'		Total within 150'	5 U	nits
_	House #38	<150 '			House #91	>150'	
7	House #39		>150 '		House #92		85'
	House #40	145'			House #93	1	70'
	House #41	<150 '		18	House #94	>150'	"
	House #42	130	145'		House #95	>150'	
		-				>130	85'
	Total within 150'		Units		House #96		
	House #43	<150 '			Total within 150'	3 U	
	House #44		145'		House #97	1 .	75'
8	House #45	>150 '			House #98	120'	
	House #46	110'			House #99	130'	
	House #47	95'		19	House #100		60'
	Total within 150'	3 (Units		House #101	110'	1
	House #48		>150 '		House #102	>150'	1
9	House #49	>150 '			House #103	105'	1
-	House #50		>150 '		Total within 150'		nits
	Total within 150'	0.1	Units		House #104	120'	
		1					
	House #51	×150 !	135'	20	House #105	110'	
10	House #52	>150 '	4	20	House #106	85'	
	House #53		>150 '		House #107	1 .	60'
	House #54 Total within 150'	>150 '	Unit		House #108 Total within 150'	60'	

<u>Table 2</u>
Owensville Road
Geometric Design Standards for Rural Collector Road System (GS-3)

TRAFFIC VOLUME	TERRAIN	DESIGN SPEED (MPH)	MIN. RADIUS	(8) MINIMUM STOPPING SIGHT DISTANCE	(2) MIN. WIDTH OF LANE	MIN WI OF G SHOU) (4) IMUM DTH RADED JLDERS	(5) MINIMUM WIDTH OF DITCH FRONT SLOPE	(6) SLOPE	NEW AND RECONSTRUCTED MINIMUM BRIDGE WIDTHS AND VERTICAL CLEARANCES
	LEVEL	60	1204'	570'		W/GR	FILL	10' @ 6:1	CS-4, CS-4A	
(1)	ROLLING	50	760'	425'		_		10 @ 0.1	OR CS-4C	
ADT OVER 2000		45	589'	360'	12'	12'	8'	6' @ 4:1		
OVER 2000	MOUNTAINOUS	40	446'	305'					CS-3 / CS-3B	
	LEVEL	50	760'	425'						
(1)	ROLLING	45	589'	360'				6' @ 4:1	CS-4, CS-4A OR CS-4C	
ADT 1500	ROLLING	40	446'	305'	11'	10'	6'		017 00-10	
TO 2000	MOUNTAINOUS	35	316'	250'				4' @ 4:1	CS-3/ CS-3B	
	WOONTAINOUS	30	215'	200'				4 (0, 4.1	C3-3/ C3-3D	0
	LEVEL	50	760'	425'					CS-4, CS-4A	See Footnote
(1)	ROLLING	45	589'	360'	11'	(9)	(9)	6'@ 4:1	OR CS-4C	(7)
ADT 400	ROLLING	40	446'	305'	''	9'	(s) 5'		011 00 10	
TO 1500	MOUNTAINOUS	35	316'	250'		9	3	4' @ 4:1	CS-3/ CS-3B	
	MOUNTAINOUS	30	215'	200'	10'			4 (0, 4.1	C3-3/ C3-3D	
	LEVEL	45	589'	360'				6' @ 4:1		
CURRENT		40	446'	305'				0 @ 1.1		
ADT	ROLLING	35	316'	250'	10'	8'	2'		CS-1	
UNDER	7.022110	30	215'	200'	"	5	2	4' @ 4:1		
400	MOUNTAINOUS	25	135'	155'				T. 1		
		20	77'	125'						

Note: Table excerpted from Page A-14 of VDOT's Road Design Manual.

According to VDOT's design criteria above, Rural Collectors with traffic volumes over 2,000 ADT shall maintain lane widths of 12' and minimum horizontal curve radii of 760 feet. Owensville Road generally maintains 11-foot lanes with shoulders ranging from 0 to 1 foot in width. Additionally, it was determined using aerial imagery that eight (8) of the eleven (11) horizontal curves along Owensville Road maintain radii that do not meet the VDOT standard. Five (5) of these curves include Advisory Speed signing of 25 mph. Figures 3 and 4 provide the radius measurements for the eleven (11) horizontal curves along Owensville Road.

Due to the angle of the northern approach to the unsignalized intersection of Owensville Road & US 250, turning paths for Single Unit Trucks (30-foot wheelbase), WB-40 Trucks and WB-50 Trucks were also overlaid upon aerial imagery to evaluate the right-turn movement from westbound US 250 onto northbound Owensville Road. Accordingly, **Figure 5** illustrates that each of these truck types encroach upon the southbound lane of Owensville Road when turning right from US 250.

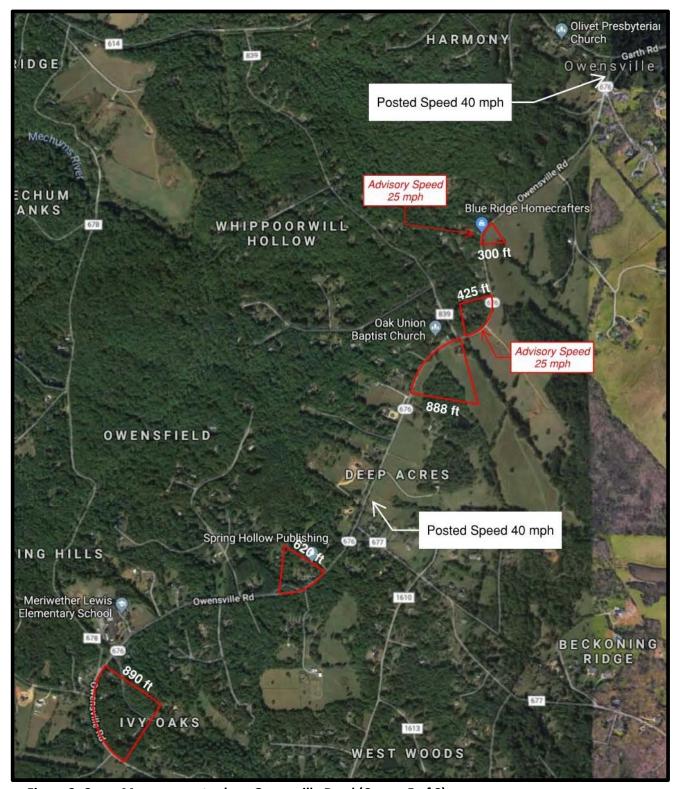


Figure 3: Curve Measurements along Owensville Road (Curves 5 of 8)

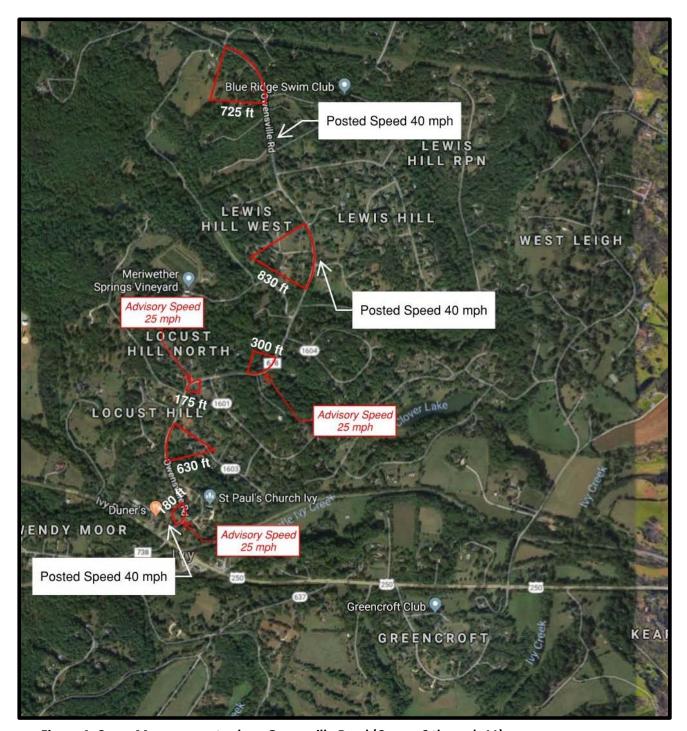


Figure 4: Curve Measurements along Owensville Road (Curves 6 through 11)

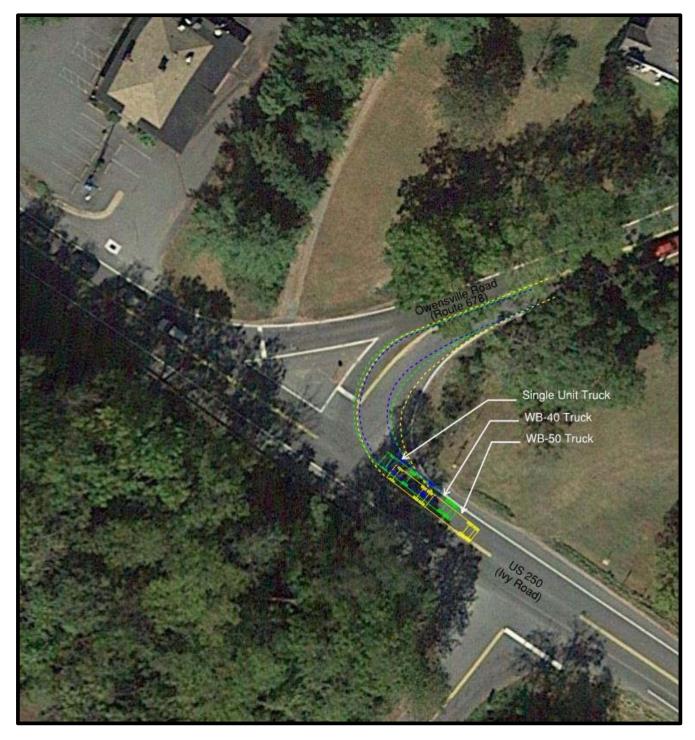


Figure 5: Turning Paths for Single Unit Trucks (30-foot wheelbase), WB-40 Trucks and WB-50 Trucks

ALTERNATE ROUTES

It is assumed that trucks currently use Owensville Road as part of a cut-through route between US 250 and US 29. This route is 15.0 miles in length with a total travel time for trucks of 28 minutes based upon trip data extrapolated from Google Maps. The proposed alternate routes described below, and provided on **Figure 6**, would mitigate the impacts to trucks should they be restricted from using Owensville Road. Detailed methodology for calculating *Total Travel Time* and *Average Truck Speed* are provided in the **Appendix** section of this report.

Current Route: US 250 ↔ Owensville Rd ↔ Garth Rd ↔ Woodlands Rd ↔ Earlysville Rd ↔
 Dickerson Rd ↔ Airport Rd ↔ US 29

o Length: 15.0 Miles

o Average Truck Speed: 32.0 mph

o Total Travel Time: 28 minutes

Alternate Truck Route #1: US 250 ↔ I-64 ↔ US 29/250 ↔ US 29

o Length: 29.1 Miles

o Average Truck Speed: 45.7 mph

o Total Travel Time: 38.2 minutes ($\Delta + 10.2$ minutes)

• Alternate Truck Route #2: US 250 ↔ US 29/250 ↔ US 29

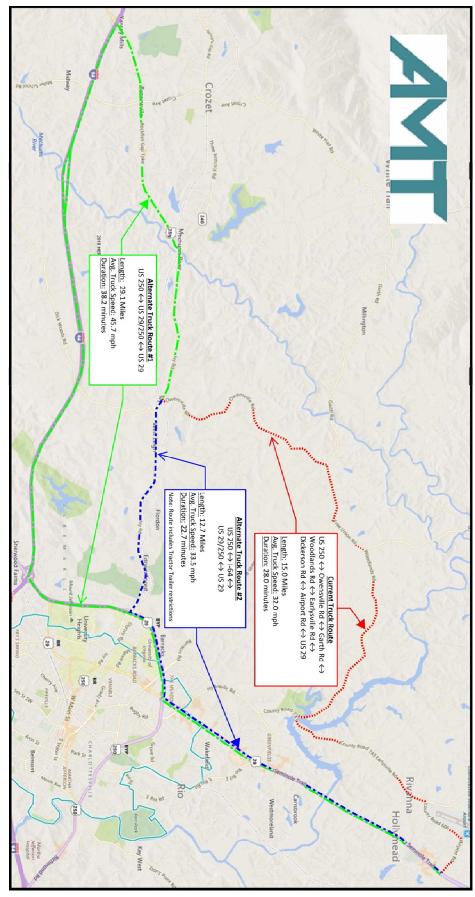
o Length: 12.7 Miles

Average Truck Speed: 33.5 mph

Total Travel Time: 22.7 minutes (Δ - 5.3 minutes)

Note: Tractor trailers would be restricted from using this route due to the 13' 2" bridge clearance at US 250 (Ivy Road) over Short Line/CSX Railroad

Figure 6: Owensville Road Alternative Truck Routes



CONCLUSION

The purpose of this Study was to determine if truck traffic may be restricted along Owensville Road based upon Virginia Commonwealth Transportation Board (CTB) Criteria. According to the CTB's "Guidelines for Considering Requests to Restrict Through Trucks on Primary and Secondary Highways", it has been concluded based upon the documentation included in this Study, that Owensville Road would meet the established criteria to implement the restriction. The following summarizes the results of the Study with respect to the guidelines set forth by the CTB:



Reasonable alternate routing is provided. The alternate route will be evaluated for traffic and safety related impacts. To be considered "reasonable", the alternate route(s) must be engineered to a standard sufficient for truck travel, and must be judged at least as appropriate for truck traffic as the requested truck restriction route. If an alternate route must be upgraded, the improvement shall be completed before the truck restriction can be implemented. The termini of the proposed restriction must be identical to the alternate routing to allow a time and distance comparison to be conducted between the two routings. Also, the alternate routing must not create an undue hardship for trucks in reaching their destination.

Conclusion:

Two (2) alternative routes have been provided that meet the geometric standards necessary to accommodate truck traffic and improve safety for road users in the area. The following table provides a comparison between the current route and the two (2) alternative routes as depicted on **Figure 6**:

Current Route	Alternative Route #1	Alternative Route #2
15.0 miles	29.1 miles	12.7 miles
32.0 mph	45.7 mph	33.5 mph
28.0 min	38.2 min	22.7 min
Differential	Δ + 10.2 min	Δ - 5.3 min

 Alternative Route #1 would provide a "reasonable" option for Trucks traveling between US 250 and US 29. The duration for trucks would increase by 10.2 minutes, however, the roadway characteristics US 250, I-64 and US 29 are far more compatible with accommodating Truck traffic than the Current Route.

Note: Alternative #2 would provide a shorter route, however, tractor trailer trucks would be restricted due to the 13' 2" bridge clearance at US 250 (Ivy Road) over Short Line/CSX Railroad. As a result, this option would not be considered a "reasonable" alternative for all through trucks.



The character and/or frequency of the truck traffic on the route proposed for restriction is not compatible with the affected area. Evaluation will include safety issues, accident history, engineering of the roadway, vehicle composition, and other traffic engineering related issues.

Conclusion:

This Study included an evaluation of the five-year crash history, horizontal roadway radii, vehicle volumes/composition and turning paths for trucks. The following summarized the results of this evaluation:

Five-Year Crash History

Owensville Road maintains a crash rate of 157.02 crashes per 100 million vehiclemiles of travel north of Tilman Road and 229.15 million vehicle-miles of travel south of Tilman Road.

- These rates exceed the District average of 147.08 crashes per 100 million vehicle miles. Restricting truck use may reduce the crash rate along Owensville Road.

Horizontal Roadway Radii

Eleven (11) horizontal curves along Owensville Road were compared to the VDOT "Geometric Design Standards for Rural Collector Road System (GS-3)"

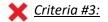
- Eight (8) of the eleven (11) curves have radii less than the VDOT Standard. Trucks must encroach upon the opposing lane to maneuver through these curves.

Turning Paths for Trucks

Turning paths for Single Unit Trucks (30-foot wheelbase), WB-40 Trucks and WB-50 Trucks were overlaid upon aerial imagery to evaluate the right-turn movement from westbound US 250 (Ivy Road) onto northbound Owensville Road.

- Each of these truck types encroach upon the southbound lane of Owensville Road when turning right from US 250. Restricting truck traffic would remove this existing conflict from the intersection.

In addition to meeting the first two criteria, the proposed restriction must meet either the third or the fourth criteria in order to be approved.



The roadway is residential in nature. Typically, the roadway will be judged to be residential if there are at least 12 dwellings combined on both sides within 150' of the existing or proposed roadway center line per 1,000 feet of roadway.

Conclusion:

Owensville Road provides direct access to one hundred and eight (108) single-family detached residential units. The roadway cannot be judged as "residential" since there are not at least 12 dwelling units combined on both sides within 150' of the centerline per 1000' of roadway.



The roadway must be functionally classified as either a local or collector.

Conclusion:

Owensville Road is classified as a Major Collector.

APPENDIX

Traffic Counts

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (All Vehicles except Box Trucks and Tractor Trailors)

(In Minutes)		PEAK HOURS	AM P 12:00AM	ERIOD 1-12:00PM	Start 07:30	End 08:30	Volume 631				ERIOD -12:00AM	Start 17:15	End 18:15	Volume 603						
Street Name>						Owensville Rd					Garth Rd (Rte	614)				Garth Rd (Rte 6	14)			7
HOUR			From Nort					From South					From East				Fr	rom West		GRAND
ENDING	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right Total	TOTAL
DAY 1: 3/14/18																				
00:15	0	0	0			0		0			0	1	0		1	0	0	0	0 0	
00:30	0		0		0	0	0				0			0		0	0	1	0 1	
00:45 01:00	0		0			0					0					0	0	0		2
01:15	0	Ö	0	0	0	0	0	0		0	0		1	. 0	1	0	0	1	0 1	2
01:30			0	0	0	0	0				0		0	0		0	0	0	0 0	
01:45 02:00	0		0		0	0	0	0			0			0		0	0	0	0 1	0
02:15			0			0					0					0	0	0		
02:30	0	0	0	0	0	0	0	0	0	0	0	0	1	. 0	1	0	0	0	0 0	1
02:45	0		0		0	0	0	0			0			0		0	0	0	0 0	
03:00	0		0	0	0	0	0				0	0		0		0		0	0 0	
03:30			0			0					0					0	0	0		
03:45 04:00	0		0			0	0	0			0	0		0		0	0	1		
04:15	0	0	0	0	Ö	0	0	0	Ó	0	ő	1	0	0	1	0	0	1	0 1	2
04:30 04:45	0	0	0			0	0	0			0	0	0	0	0	0	0	3	0 3	5
05:00 05:15	0	0	0		Ö	0	1 0		4	5	ő	0	0	0	Ö	0		7	0 7	12
05:30	0	Ö	0	0	0	0	0	0	3	3	0	ŏ	2 0	0	0	0	0	4	0 4	7
05:45 06:00	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	6 7	0 6	10 10
06:15	0	0	0	0	0	0	0	0	- 1	1	0	1 4	4	0	8	0	0	12	0 12	21
06:30 06:45	0		0		0	0	0	0	4 3		0	3	1	0	4 E	0	0	13 33	0 13 1 34	42
07:00	0	0	0	0	0	0	0	0	8	8	0	7	3	. 0	10	0	0	33	1 34	52
07:15 07:30	0		0		0	0	0	0	9		0	10 25	8 16	0	18 41	0	0	36 36	0 36 2 38	52 63 98
07:45 08:00	0	0	0	0	0	0	0	0	34	34	Ö	30	14		44	0	0	75 58	5 80	158
08:15			0	0	0	0	2	0	56	58	0	15	21	0	41 36	0	0	62	0 62	156
08:30 08:45	0		0			0	1	0	38	39	0	19	17	. 0	36	0	0	69 54	0 69	144
09:00	ō	0	0	0	0	0	5	0	24		0	23 21 26	27		48	Ö	0	55 25	2 57	134
09:15	0	0	0	0	0	0	4	0	24 29 28 20	33	0	26	21	. 0	47	0	0	25 31	2 27 3 34	107
09:45	Ö	Ö	ō	Ö	Ö	Ö	3	Ö	20	23	Ö	12	14	0	26	Ö	Ö	31	2 33	82
10:00 10:15	0		0			0		0	23		0		17			0	0	25 27	1 26 0 27	76 65
10:30	0	0	0	0	0	0	0	0	16	16	0	11	17	. 0	28	0	0	24	2 26	70
10:45 11:00	0		0			0		0	15	16	0	12	13	. 0		0	0	19 20	2 21	62
11:15	Ö	0	0	0	0	0	0	0	25	25 16	0	12	23	0	35	0	0	29 29	1 30	90
11:30 11:45	0	0	0	0	0	0	2	0	21	23	0	14	15		29	0	Ö	23	2 25	. 77
12:00 12:15 12:30	0		0			0	1	0	28 10 16	29 12	0	20 12	16 18	0	36	0	0	22 30	2 24 7 37 1 31	89 79 105 94 64
12:30	0	0	0	0	0	0	2		16	20	0	22	32	. 0	54	0	0	30	1 31	105
12:45 13:00	0		0			1 0		0		21 20	0		30 12		51 22	0	0	22 21	0 22 1 22	94
13:15	0	0	0	0	0	0	0	0	21	21	0	20	29	0	49	0	0	29	4 33	103
13:30 13:45	0		0			0		0			0		26 22		49 34	0	0	21 28	1 22	
14:00	0	0	0	0	0	0	2	0	24		0	20	24 13	0	44	0	0	17	3 20 3 27	90
14:15 14:30	0		0	0		0		0	20 16	22 16	0	15 23	13 31	0		0	0	24 14	3 27 2 16	77
14:45 15:00	0	0	0	0	0	0	3	0	26	29	0	25	30	0	55	0	0	20 23	3 23 0 23	107
15:00	0		0		0	0	2	0	28 26 17	32 28	0	16	28	0	42	0	0	23	0 21	93
15:30 15:45	0		0	0	0	0	4	0			0	24	36	0	60	0	0	23 20	3 26 1 21	107
16:00	0	0	0	0	0	0	0	0	31	31	0	25	42 25	0		0	0	22 16	1 23 2 18	121 89
16:15	0		0	0	0	0	1	0	29	30 40	0	31	30			0	0	16 19		130
16:45 17:00	0	Ö	Ö	0	0	0	4	0	29	33 31	0	29	48	0	77	0	0	43 20	1 20 3 46 3 23	130 156 122
17:15	0	0	0	0	0	0	3	0	19	22	0	40	40	0	80	0	0	23	0 23	125
17:30 17:45	ő		0	0	0	0	3	0	20	23	0	34	60	0	94	0	0	25 24	2 27 4 28	144 176
18:00	0	0	0	0	0	0	2	0	22	24	0	54	43	0	97	0	0	24	1 25	146
18:15	0	0	0	0	0	0	1	0	23	24 17	0	44	52	0	96	0	0	17	0 17	137
18:30 18:45	0	0	0	0	0	0	- 1	0	16	17	0	30	40	0	70	0	0	13 16	5 21	109
19:00 19:15			0		0	0		0	13	15	0	32	31	0	63 53	0	0	19 12	1 20	98 82
19:30	0	0	0	0	0	0	2	0	7	9	0	19	30	0	49	0	0	16	1 17	75
19:45 20:00			0		0	0		0			0		27 18	0		0	0	7	1 8	53 47
20:15	0	0	0	0	0	0	1	0	3	4	0	17	20	0	37	0	0	9	0 9	50 37
20:30 20:45	0		0			0	0	0		9	0		15 24			0	0	4 10	1 5 3 13	- 37 58
20:45 21:00 21:15	0	0	0	0		0			2		0	8				0		10 3		23
21:30	0	0	0	Ó	0	0	0	0	3	3	0	5		0	18	0	0	3	0 2	25 23
21:45 22:00	0	0	0	0	0	0	0	0	5	5	0	2	14	0	16	0	0	4	1 5	26 24
22:15	0	0	0	0	Ö	0	0 0	0	5	5	0	4			12 8	0	0	6	1 4 0 6 0 2	19
22:30	0	0	0	0	0	0	, j	0	1	1	0	5	7			0	0	2	0 2	15
22:45 23:00	0	0	ō	Ö	Ö	0	0	ő	1		Ö	3	4	0	7	0	0	3	0 3	19 15 21 11 9
23:15 23:30	0	0	0	0	0	0	0	0	3	3	0	1	3 7	0	4	0	0	2	0 2	9 1
23:45	0	0	0	Ó	0	0	0	0	0	0	0	1	4		5	0	0	1	0 1	6 10
00:00	0	0	0	0	0	0	0	1 0	1	1	0	2	4	0	6	0	0	3	0 3	10
TOTAL	0	0	0	0	0	1	89	0	1281	1371	0	1259	1582	0	2841	0	0	1600	102 1702	5914
AM Peak Vol	0	0	0	0	0	0	7	0	196	203	0	92	65	0	157	0	0	264	7 271	631

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (Box Trucks)

 Job No.:
 17-0013.003

 Location:
 Owensville Rd at Carth Rd (Rte 614)
 State:
 Virginia

 Date:
 3/14/2018 & 3/15/2018
 Town:
 Charlottesville

 Recorder:
 Interval (dd):
 Weather:

No. Part	(In Minutes)	1	PEAK HOURS	AM PE 12:00AM-		Start 10:45	End 11:45	Volume 26				ERIOD -12:00AM	Start 12:00	End 13:00	Volume 16						
Second S				12.00AW	12.00FW						12.00FW			1			Garth Rd (Rte 6	14)			7
Section Sect	HOUR	Uturn	Loft	From North	Pight	Total			From South	Pight	Total				Dight	Total				Pight Total	GRAND
0.01		O tuili	Leit	illiougii	Kigitt	Total	O tuin	Leit	illiougii	Rigit	Total	O turn	Leit	mougn	Right	Total	O turn	Leit	miougii	Rigit	IOIAL
March C	00:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	
100					0	0	0	0						0	0		0	0	0	0 0	0
Title			0		0	0	0	0					0	0	0		0			0 0	0
Color Colo	01:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
Color Colo	01:45	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0 0	
Color Colo							0	0		0		0	0	0	0		0	0	0	0 0	0
Color Colo							0	0						0	0						
Column C	03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
Col.	03:15	0	0		0	0	0	0		0	0	0	0		0	0	0			0 0	
Color Colo	03:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
Color Colo	04:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	
Color Colo	04:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
100 10 10 10 10 10 10 1	05:00	0	0	0	0	Ó	0	0			0	0	0	0	0	0	0	0	0	0 0	0
100 10 10 10 10 10 10 1	05:30 05:45	0	0		0	0	0	0	0	0		Ö	0		0	0	Ö			0 0	
10	06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
Color Colo	06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
0.00	07:00	0	0	Ō	0	Ö	0	0	ō	0	0	0	0	1	ő	1	0	0	0	1 1	5
0.00	07:30			0	0	0	0	0	0	1		0	0		0	0	0	0	0	0 0	0 1
0.00	07:45 08:00			0			0	0	0			0	0	1	0		0	0	1 0	0 1	2
Color Colo		0	0		0	0	0	0	0	1		0	0		0	1	0	0	0	0 0	
0.05	08:45	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0 0	2
1000	09:15	0	0	0	0	0	0	0	0	2	2	0	0	3	. 0	3	0	0	1	0 1	. 6
1000	09:45	Ö	Ö	Ö	0	0	0	0	0	1		0	0		0	3 4	Ö	Ö	0	0 1	5
\$\frac{1}{11} \frac{1}{12} \f	10:15	0					0	0	0		2	0	1		0	1	0			0 0	3
1100	10:30 10:45	0	0	0	0	0	0	0	0	0		0	0		0	1	0	0	3	0 3	3 4
1130 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11:00	0	0	0	0	0	0	3	0	0	3	0	2		0	2	0	0	Ö	0 0	5 12
1320	11:30				0	0	0	0	0	1		0	0	2	0	2	0	0	0	0 0	3
1255 5	11:45				0	0	0	1	0	0		0	1		0	1	0	0	2	1 3	5
1330	12:15 12:30	0	0	0						2	2	0	1	3		4				2 2	2 8
1348	13:00	0	0	0	0	0	0	0	0	2	2	0	0	3	0	- 1	0	0	0	0 0	3
1348	13:15 13:30				0	0	0	0	ō	- 1	0	0	1		0	1	0	0	- 1	0 1	0 3
14:15	13:45				0	0	0	0		3	3	0	1	2	0	3	0	0	1	0 1	7
1500	14:15	0	0	0	0	0	0	0	0	0	Ō	0	0	1	0	1	0	0	3	0 3	4
1515 0	14:45	ŏ	ŏ	ŏ	Ö	ŏ	ŏ	ő	ŏ	0	Ö	ŏ	Ô	0	ŏ	0	ŏ	ő	ŏ	0 0	0
18-80 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15:15	0	0	0	0	0	0	0	0	0		0	0	0			0	0	0	0 0	0
1630	15:45	0	0	0	0	0	0	0	0	- 1	1	0	0		0	0	0	0	0	0 0	1
1630	16:00 16:15	0									3			1	0	1					5
1700	16:30 16:45	0	0	0	0	0	0	0	0	1	0	0	0		0	0	0	0	2	0 0	0 3
1739 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	17:00 17:15	0	0	0	0	0	0	0	0	0		0	0		0	1 2	0	0	0	0 0	1 1
1800	17:30	0	0	0	0	0	0	0	ō	1	i	0	1	1	0	2	ō	0	ō	0 0	3
1830	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0 1	1
1900	18:15 18:30			0			0	0	0	1 0	0				0	0				0 3	3
19:15	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0
19:45 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	19:30	0	0	0	0	0	0	0	0	0	ō	0	0	0	0	0	0	0	0	0 0	Ö
20:15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
2045 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20:15	0	0	ō	0	0			ő	0	ō	0	0	ō	Ö	0	ō			o o	Ö
21:30 0 <td>20:45</td> <td>0</td> <td></td> <td>0 0</td> <td>0</td>	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0 0	0
2145 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21:15	0	0	0	0	0				0	0	0	0	0		0	0	0	0	0 0	0
22:00	21:45	0	0	0	0	0	0	0		0	0	0	0			0	0	0	0	0 0	0
22:30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	0	0 0	0
23:00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
23.45 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	23:00	0	0	0	Ö	Ö	0	0	0	Ö	Ö	Ö	0	1	. 0	1	0	0	0	0 0	1
0000	23:30	0	0	ō	0	0	0	0	ō	0	ō	0	0	ō	0	0	ō	0	0	o c	0
TOTAL 0 0 0 0 0 0 0 5 0 46 51 0 29 44 0 73 0 0 29 4 33 157 AM Peak Vol 0 0 0 0 0 0 4 0 4 8 0 7 7 0 14 0 0 4 26		0	0				0	0				0	0								
AM Peak Vol 0 0 0 0 0 0 0 4 0 4 8 0 7 7 7 0 14 0 0 4 0 4 25	TOTAL	n	0	0 1	0	n	0	5	n	46	51	n	29	44	n	73	0	0	29	4 33	157
					0			4						7						0 4	26

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (Tractor Trailors)

 Job No.:
 17-0013.003

 Location:
 Owensville Rd at Carth Rd (Rte 614)
 State:
 Virginia

 Date:
 3/14/2018 & 3/15/2018
 Town:
 Charlottesville

 Recorder:
 Interval (dd):
 Weather:

(In Minutes))	PEAK HOURS	AM PERIOD 12:00AM-12:00PM	Start 08:30	End 09:30	Volume 3				ERIOD I-12:00AM	Start 17:00	End 18:00	Volume 2							
Street Name->			12:00AM-12:00PM	08.30	Owensville Ro	1			12:00PM	Garth Rd (Rte		18.00			Garth Rd (Rte	614)				l
HOUR ENDING	U turn	Left	From North Through Right	: Total	U turn		From South Through	Right	Total			From East Through	Right	Total			From West Through	Right	Total	GRAND TOTAL
DAY 1: 3/14/18						•														
00:15 00:30	0	0	0	0 0			0	0	0	0	0	0	0	0	0	0		0		0
00:45	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0			0 0				0							0	0				0
01:30	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 02:00	0	0	0	0 0		0		0	0		0		0	0	0	0		0		0
02:15	0		0	0 0				0	0		0				0	0				0
02:30 02:45	0			0 0				0			0				0	0				0
03:00	0	0	0	0 0	0	0	0	0	0	0	0	0	ō	0	0	0	0	0	0	0
03:15 03:30	0	0	0	0 0		0		0	0		0	0	0	0	0	0				0
03:45	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 04:15	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 04:45	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 05:15	0	0	0	0 0 0 0 0 0	0	Ö	0	0	0	0	0		0	0	Ö	0	0	Ö	0	0
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05:45 06:00	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 06:30	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 07:00	0		0	0 0	0	0	0	0		0	0	0	0		0	0			0	0
07:15	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 07:45 08:00	0	0	0	0 0	0 0	0	0	0	1	0	0		0	0	0	0	0	0	0	0
08:15	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 08:45	0		0	0 0	0	0	0	0	0	0	0		0	0	0	0		0	0	0
09:00 09:15	0	0	0	0 0	0	0		0	0	0	1 1	0	0	1	0	0	0		0	1
09:30 09:45	0	0	0	0 0	ĕ	0	0	0		0	2	0	0	2	0	0	0		0	2
10:00	0	0	0	0 0	Ö	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
10:15 10:30	0	0	0	0 0	0 0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
10:45 11:00	0		0	0 0	0	0	0	0		0	1	0	0		0	0			0	0
11:15	0	0	0	0 0	0 0	0		0	0	0	0	0	0	0	0	0	1	0	1	1
11:30 11:45 12:00	0	0	0	0 0	ő	0	0	0	ő	0	0	0	0	ő	0	0	0	0	0	0
12:15 12:30	0	0	0	0 0	0	0		0		0	0		0	0	0	0	0	0	0	0
12:45	0	ő	0	0 0	0 0	0	0	0	0	0	0		ō	Ó	0	0	0	0	0	0
13:00 13:15	0		0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30 13:45	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00 14:15	0	0	0	0 0	0	0		0	0	0	0	0	0	0	0	0	0		0	0
14:30 14:45	0		0	0 0	Ö	8	Ö	0	0	0	0	0	0	0	0	0		0		0
15:00	0	0	0	0 0	0	Ó	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0 0	0 0	0		1 0	0	0	0	0	0	0	0	0	0	0	0	0
15:45 16:00	0		0	0 0	0	0	0	0	0	0	0	0	0	0	0	0				0
16:15	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 16:45 17:00	0	0	0	0 0	, i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0 0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
17:30 17:45	0	0	0	0 0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
18:00 18:15	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	Ó	0	0	0	0	0	0
18:30 18:45	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0			0
19:00 19:15	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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19:45 20:00	0	0	0	0 0	0	0	0	0	0			0		0	0	0	0	0	0	0
20:15 20:30	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45 21:00	0	8	0	0 0	0	8	0	0	0	0 0 0 0	8	0	0	0	0	0	0	0	0	0
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22:30 22:45	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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23:30	ő	0	ő	0 0	0	Ö		0	0	ő	0	0	ő	ō	Ö	0	0	0		0
23:45 00:00	0		0	0 0	0	0		0	0	0	0	0	0		0	0		0	0	0
TOTAL	0	0	0 0	0	0	0	0	2	2	0	7	,	0	10	0	0	1	0	1	13
AM Peak Vol	0	0	0 0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3 2
DM Dook Vol			0 0	0					0								0		0	

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (All Vehicles except Box Trucks and Tractor Trailors)

(In Minutes)		PEAK HOURS	AM PERIOD 12:00AM-12:00PM	Start 07:30	End 08:30	Volume 1291				ERIOD -12:00AM	Start 17:15	End 18:15	Volume 1512						
Street Name->	Owensville	Rd								Ivy Rd (Rte 250	0)				lvy Rd (Rte 25)				l
HOUR ENDING	U turn	Left	From North Through Right	Total	U turn	Left	From South Through		Total	U turn	Left	From East Through	Right	Total	Uturn		m West hrough Right	Total	GRAND TOTAL
	O tum	LCIT	mough mgm	Total	O tain	Len	rmougn	nagar.	10001	O turn	Len	mougn	rugin	Total	O turn	LC.C	mough mgm	. , , , ,	l
DAY 1: 3/14/18 00:15	0	0	0	0 0	0	0	0	0	0	0	0	10	0	10	0	1	1	0 2	12
00:30 00:45	0	0	0	0 0	0	0		0	0	0	0			6	0			0 8	14 6
01:00	0	0	0	0 0	0	0	0	0	0	0	0	4	0	4	0	0		0 4	8
01:15	0	0	0	1 1	0	0	0	0	0	0	0			2	0	0	3	0 3	6
01:30 01:45	0	0	0	1 1 0 0	0	0		0	0	0	0			1	0	0	2	0 2	5
02:00	0	0	0	0 0	0	0	0	0	0	0	0	2	0	2	0	0	0	0 0	2
02:15 02:30	0	0	0	0 0	0	0	0	0	0		0	1	0	1	0	0	1	0 1	2
02:45	0	0	0	0 0	0	0	0	0	0	0	0	2	0	2	0	0	1	0 1	3
03:00 03:15	0	0	0	0 0	0	0		0	0					0	0			0 3	3
03:15	0			0 0		0		0	0					0	0			0 0	0
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04:30 04:45	0	1	0	0 1	0	0	0	0	0	0	0	4	ō	4	0	1	10	0 4 0 11	9 16
05:00 05:15	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	8 14	0 8	8 15
05:30	0	4	0	0 4	Ö	0	0	0	0	0	0	1	Ö	1	0	1	23	0 24	29
05:45 06:00	0	9	0	0 9	0	0	0	0	0	0		2 6	0	2 6	0		31 24	0 31 0 25	37 40
06:15	0	6	0	2 8 6 a	0	0	0	0	0	0	0	5 10	0	5 10	0	0	36	0 36	49
06:30 06:45 07:00	0	13	0	5 18 7 27	0	0	0	0	Ö	0	Ö	13	1	14	ő	4 6	63 79 96	0 67 0 85 0 98	86 117 165
07:00	0	20 12	0	8 20		0	0	0	0	0	0	27	9	36 55	0	5	120	0 125	181
07:15 07:30 07:45	0	20 29	0	16 45	0	0	0	0	0	0	0	53	17	70	0	10 14	168 199	0 178 0 213	181 271 328 351 272 340 294
08:00 08:15	0	36	0	27 63 18 41	0	0	0	0	0	0	0	64 53		78 58	0	14 16	196 157	0 210 0 173	351
08:30	0	16	0	39 55	0	0	0	0	0	0	0	87	14	101	0	14	170	0 184	340
08:45 09:00	0	17	0	19 36	0	0		0	0	0	0		12	69 96	0	11	144	0 155	294
09:15 09:30	0	22	0	24 46	0	0	0	0	0	0	0	72	14 8	76 80	0	17	137	0 142	287 276 230
09:45 10:00	Ö	6 18	0	12 30 7 20	Ö	Ö	Ŏ	Õ	Ö	Ŏ O	Ö	43	11	54 65	Ö	11	130	0 141 0 104	225
10:15	0	14	0	8 22	0	0	0	0	0	0	0	55	5	60	0	8	89	0 97	189 179
10:30 10:45	0		0	10 26 12 23	0	0	0	0	0	0	0	56 60	7 14	63 74	0	15 5	99 117	0 114 0 122	203 219 187
11:00 11:15	0	8	0	9 17	0	0		0	0	0	0	53 68	17 11	70 79	0	11	89 74	0 100	187
11:30 11:45	Ö		0	10 34	0	0	0	0	0	0	0	60	15 10	75	0	8 12	83 98	0 82 0 95 0 108	181 204 221
12:00	0	14	0	12 31 6 20	0	0	0	0	0	0	0	93	17	110	0	10 9 7	76 77	0 108 0 85 0 84	215
12:00 12:15 12:30 12:45	0	16	0	11 24 10 26	0	0	0	0	0	0	0	83 95	15 24	98 119	0	8	83	0 85 0 84 0 91	215 206 236 210 193
12:45 13:00	0	8	0	9 17 8 23	0	0		0	0	0		84 68	22	106 86	0	13 4	74 80	0 87 0 84	210
13:15	0	13	0	7 20	0	0	0	0	0	0	0	85 70	8	93 85	0	13	70	0 83	196 181
13:45	0	6	0	12 24 8 14	0	0	0	0	0	0	0	99	17	116	0	6	64 59	0 72 0 65	195
14:00 14:15	0	12 13	ñ	11 23 5 18	0	0	0	0	0	0	0	98 93	15	113 108	0	18 12	60 82	0 78	214 220 196 249
14:15 14:30 14:45	0	13 13 23	0	6 19 17 40	0	0	0	0	0	0	0	92 88	16 22	108 110	0	12 9 12	60 87	0 94 0 69 0 99	196
15:00	0	19	0	4 23	0	Ó	Ö	0	ŏ	Ö	0	97	17	114	Ö	11	89	0 100	
15:15 15:30	0	9	0	13 31 12 21 21 37	0	0	0	0	0	0	0	110 121	8	123 129	0	5 5	65 75	0 70 0 80	224 230 268
15:45 16:00	0			21 37 24 39	0	0		0	0	0		117 126	15 20	132 146	0	16 11	83 79	0 99	268 275
16:15 16:30	0	14	0	15 29	0	0	0	0	0	0	0	132	19	151	0	20	85 86	0 105 0 116	285
16:30 16:45 17:00	Ō	23	0	13 27 11 34	0	0	0	0	0	0	0	157 153 178	23 24	180 177	0	30 20 17	86 82 70	0 116 0 102 0 87	275 285 323 313 331
17:15	0	15	0	24 42 17 32	0	0	0	0	0	0	0	197	24	202 221	0	20	76	0 96	331 349
17:30 17:45	0	14 11	0	32 46 27 38	0	0	0	0	0	0	0	220	26	246 236	0	14 19	67 77	0 81	349 373 370
18:00 18:15	0	14	0	44 58	0	0	0	0	0	0	0	242	22	264 230	0	14	69 80	0 83	405
18:30	0	14	0	12 26	0	0	0	0	0	0		233	21	254	0	22 18 10		0 102 0 83	364 363 251 219
18:45 19:00	0	9	0	21 30 5 14	0	0	0	0	0	0		136 137	22	155 159	0	10	65 56 36	0 66	251 219
19:15 19:30	0		0	11 18 11 21	0	0	0	0	0	0	0	102 89	15 20	117 109	0	14 14	46 47	0 60 0 61	195
19:45	Ö	3	0	7 10		0		0	0	0	0	72	12	84	0	12	43	0 55	191 149
20:00 20:15	0	3	0	5 7	0	0	0	0	0	0	0	94 77 67	14 10	108 87	0	7	26 24	0 33	148
20:15 20:30 20:45 21:00	0		0	4 9 5 7	0	0	0	0	0	0	0	67 67	9	76 77	0	9	24 28 27 19	0 37 0 32 0 24	148 128 122 116
21:00 21:15	ŏ	2	0	2 4 5 13	0	0	0	0	ğ	Ö	0	46		57 61	ŏ	5	19 27	0 32 0 24 0 34	
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22:15 22:30	0		0	0 1	0	0		0	0	0	0	27		32 24	0	3	9	0 12 0 15 0 14	45
22:45	0	0	0	1 1	0	0	0	0	0	0	0	10	1	11	0	3	11	0 14	26
22:45 23:00 23:15	0	1	0	0 0	0	0		Ŏ O	0	Ŏ O	0	13	1	19 14	0	2	8 7	0 8	26 27 25 21
23:30 23:45	0	1 0	0	0 1	0	0	0	0	0	0	0	10 11	4	14	0	0	6	0 6	21
00:00	ŏ		0	1 1	ŏ	ŏ	ŏ	0	ŏ	0	ŏ		ŏ	11 10	ŏ	1	5	0 3	14 17
TOTAL	0	846	0 813	1659	0	0	0	0	0	0	0	5938	918	6856	0	739	5406 0	6145	14660
AM Peak Vol	0	104	0 100	204	0	0	0	0	0	0	0	257	50	307	0	58	722 0	780	1291

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (Box Trucks)

		PEAK HOUR		PERIOD 1-12:00PM	Start 09:00	End 10:00	Volume 34				ERIOD -12:00AM	Start 12:00	End 13:00	Volume 20						
Street		<u> </u>	12:00AW	1-12:00PIVI	05.00	10.00	34	1	1	12:00PM	-12:0UAIVI	12.00	13.00	20						
Name>	Owens	/ille Rd									Ivy Rd (Rte 250)				lvy Rd (Rte 250)				I
HOUR			From Nort		,			From South					From East				Fro	m West		GRAN
ENDING	U tu	rn Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left 1	hrough	Right Total	тота
DAY 1: 3/14/18																				
00:1	5	0 (0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
00:3		0 (0	0			0	0	0	0		0	0	0	0	0	0	0 0)
00:4		0 (0							0	0	0	0	0	0	0	0	0 0	
01:0	0	0 0		0	0	0				0	0	0	0	0	0	0	0	0	0 0	0
01:3	0	0 0									0				0	0	0	0	0 0	
01:4	5	0 0	0	0	0			0		0	0	0	0	0	0	0	0	0	0 0	0
02:0		0 (0		0			0	0	0	0 0	0
02:1	5	0 (0						0	0	0	0		0	0	0	0 0	
02:3 02:4	6	0 0				0					0	0			0	0	0	0	0 0	0
03:0	0	0 0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0 0	0
03:1		0 (0								0		0	0	0	0	0	0	0 0	
03:3		0 (0		0			0	0	0	0 0	
03:4:		0 0		0	0			0		0	0	0	0	0	0	0	0	0	0 0	
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07:0 07:1	0	0 0	0 0	0	0	0	0	0	0	0	0	0	0	1 0	1	0	0	1	0 1	4 🗀
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08:1	5	0	0			0	0	0	0		0	0	4	2	6	0	1	1	0 2	2
08:3	0	0 (0	0	0	0	0	0		0	0	0	1	2	2	0	1	0	0 1	9 🗀
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10:0	0	ŏ č	0	0	0	0	0	0	0	0	0	0	2	3	5	ŏ	1	0	0 1	7
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10:4	5	0	0	2	3	0	0	0			0	0	3	2	5	0	0	2	0 2	, 2 1
11:0	0	0	0		1	0					0	0	1			0	2	1	0 3	3 3 1 3 1 3 1
11:1:	0	0 .	0	1	1	0	0	0	0		0	0	3 5	1	6	0	0	3	0 1	3 1
11:3 11:4	5	0 (0 0		0	0	0	0	0	0	0	0	2		2	0	0	3	0 3	3
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12:3	0	ō i	Ö	1	1	ō	0	0	0	0	0	0	1	0	1	ō	1	3	0 4	4
12:4 13:0		0 (1	2		0	0		0		0	0	5 2			0	0	4 2	0 4	7 4 4 1 3 2 2 3 3 2 1 1 1
13:1:	5	0 0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	1	1	0 2	2
13:3 13:4		0 (0	0	0	0	0		0		0		2			0	1	2	0 3	3
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14:1:	5	0 0	0 0	0	1	0	0	0	0		0	0	0 4	0	0	0	0	1	0 1	₽ ==
14:4	5	8 8		8	0		0	0	l ö	0	0	0	2	0	2	ŏ	0	1	0 1	1
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15:1: 15:3	0	0	0	3	3	0	0		0	0	0	0	0	0	0	0	0	6 1	0 6	1
15:4	5	0 (0	0	0	0	0	0	0		0	0	2	0	2	0	0	0	0 0	1 0 1
16:0 16:1	5	0 0	1	0	1 1	0	0	0	0	0	0	0	4	0	4	0	1 0	0	0 1	1
16:3 16:4		0 0) 0	0	0	0			0	0	0					0	0	1	0 1	i 🗀
16:4: 17:0		0 .	0			0			0		0		0	0	0	0	0	0	0 0	1 1 0 2
17:1:	5	0 (0	0	0	Ö	0	0	0	0	0	0	2	0	2	0	0	0	0 (0 1
17:3 17:4	0	0 0	0			0			0		0	0	1 0		1	0	0	3	0 3	3
18:0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	4	0 4	4
18:1	5	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0 1	9 I
18:3 18:4	5	0 0	0 0	0		0	0	0	0	0	0	0	0	0	0	0	0	1	0 1	4 —
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19:1: 19:3	5	0 0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 1	<u>.</u>
19:4	5	0 0	0	0	0		0	0		0	0	0	0	0	0	0	0	0	0 0	0
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20:1:	0	0 (0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0 0	0
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21:0	5	0 (0		0	0	Ö	0	ŏ	Ö	0	0	0	0	0	0	0	0	0 0	/
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22:3	0	0 (0	0	0	0	0	0	0	0	0	0	0	Ö	0	Ö	0	0	0 0	<u> </u>
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23:1:	5	0 (Ö	0	0	0	Ö	0	ő	0	0	ŏ	0	. 0	0	ō	0	0	0 0	5
23:3	0	0 0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0 1	0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
00:0		0 0				0					0		0	0	0	0	0	0	0 0	5
														•						
		-	7	17	30	0	0	0	0	0	0	0	110	18	128	0	20	83	0 103	261
TOTAL AM Peak Vol PM Peak Vol	0		0	0	1	0	0	0	0	0	0	0	16	4	20 8	0	3	10	0 13	34 20

A. Morton Thomas & Associates, Inc. Turning Movement Counts - Field Sheet (Tractor Trailors)

(In Minutes)		PEAK HOURS		ERIOD I-12:00PM	Start 10:30	End 11:30	Volume 6				ERIOD I-12:00AM	Start 12:00	End 13:00	Volume 2						
Street Name>	Owensville	Rd									Ivy Rd (Rte 25)	0)				lvy Rd (Rte 250)				٦
HOUR ENDING	U turn	Left	From Norti Through		Total	U turn	Left	From South Through		Total	U turn	Left	From East Through		Total	Uturn	Loft	From West	Right Total	G
	O turn	Leit	Inrougn	Right	TOTAL	O turn	Leit	Inrough	Right	TOTAL	Oturn	Leit	Inrougn	Rigiit	TOTAL	O turn	Leit	Through	Right Total	ㅓ Ľ
DAY 1: 3/14/18 00:15	0	0	0	0		0	0		0		0		1 0	0			0	0	0	
00:15	0	0	0								0	0) 0	0	0	0	0	0	0
00:45	0		0								0	0				0	0		0	0
01:00 01:15	0	0	0	0	0	0	0	0		0	0	0	0	0 0	0	0	0	0	0	0
01:30			0	0		0	0				0	0			0	0	0			0
01:45	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
02:00 02:15	0		0								0					0	0			0
02:15	0		0	0	0	0	0	0		0	0	0		0	0	0	0	0	0	0
02:45	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
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03:45	0		0				0				0			0	0	0	0		0	0
04:00 04:15	0		0	0	0	0	0	0	0	0	0	0	- 8	0 0	0	0	0	0	0	0
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05:15 05:30	0	0	0	0		0	0		0		0		- 5			0	0			0
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06:00 06:15	0	0	0	0		0	0		0		0		-) 0	0	0	0			0
06:30 06:45	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0) 0	0	0	0	0	0	0
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Crash Rate Calculations

Crash Rate Calculations

The crash rate for roadway departure crashes on a roadway is calculated as:

Formula: R equals C x 100,000,000 divided by V x 365 x N x L

The variables in this equation are:

R = Roadway Departure crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel

C = Total number of roadway departure crashes in the study period

V = Traffic volumes using Average Annual Daily Traffic (AADT) volumes

N = Number of years of data

L = Length of the roadway segment in miles

North of Tilman Road

$$R = \frac{100,000,000*18}{365*5*2731*2.3} = \frac{1800000000}{11463372.5} = 157.022 \text{ per 100 million vehicle miles}$$

South of Tilman Road

$$R = \frac{100,000,000*27}{365*5*3398*1.9} = \frac{2700000000}{11782565} = 229.152 \text{ per 100 million yehicle miles}$$

Culpeper District Average (2-Lane Rural): 147.08 per 100 million vehicle miles

Travel Time/Average Truck Speed Calculations

Total Travel Time and Average Truck Speed Calculations

		l/Travel Time Maps - Cars		Travel Time d - Trucks
Current Route (15.0 Miles)	60 min 1 hour	15.0 miles 24 min 37.5 mph 24.0 min	15.0 miles 32.0 mph	60 min 1 hour 32.0 mph 28.0 min
Alt. Route #1 (29.1 Miles)	60 min 1 hour	29.1 miles 35 min 50.0 mph 34.9 min	29.1 miles 45.7 mph	60 min 1 hour 45.7 mph 38.2 min Δ + 10.2 min
Alt. Route #2 (12.7 Miles)*	60 min 1 hour	12.7 miles 20 min 38.1 mph 20.0 min	12.7 miles 33.5 mph	60 min = 1 hour 33.5 mph 22.7 min Δ -5.3 min

^{*} Tractor trailers will be restricted from this route due to 13' 2" bridge clearance at US 250 (Ivy Road) over Short Line/CSX Railroad

	Average Speed - Google Maps:	Avg Car Speed: 36.0 mph	Avg Car Speed: 33.0 mph	Avg Car Speed: 38.8 mph	Avg Car Speed: 43.8 mph	Avg Car Speed: 32.3 mph	Avg Car Speed: 42.0 mph	Avg Car Speed: 70.0 mph		
ĺ	Speed Reduction for Trucks	85% speed of Car	85% speed of Car	85% speed of Car	90% speed of Car	85% speed of Car	90% speed of Car	95% speed of Car		
Ī		Owensville Road	Garth Road East of Owensville	Free Union/Woodlands /Earlysville/Dickerson	US 250 West of Owensville Rd	US 250 East of Owensville Rd	US 29/US 250	I-64		
- 1		Posted 40 mph	Posted 50 mph (45 trucks)	Posted 45 mph	Posted 45 mph	Posted 45 mph	Posted 60 mph	Posted 70 mph		
ı		Avg Truck Speed: 31 mph	Avg Truck Speed: 28 mph	Avg Truck Speed: 33 mph	Avg Truck Speed: 39 mph	Avg Truck Speed: 27 mph	Avg Truck Speed: 38 mph	Avg Truck Speed: 67 mph		
- [Δ Car vs. Truck	Δ 5.4 mph	Δ 5.0 mph	Δ 5.8 mph	Δ 4.4 mph	Δ 4.8 mph	Δ 4.2 mph	Δ 3.5 mph	Totals	Average Speed
ı	VDOT Classification	Major Collector	Major Collector	Major Collectors	Minor Arterial	Minor Arterial	Principal Arterial	Interstate		
ľ	Miles per Roadway	4.2 miles	1.1 miles	9.7 miles	0.0 miles	0.0 miles	0.0 miles	0.0 miles	15.0 miles	
rte	Travel Time: Cars (Google)	7 min	2 min	15 min	0 min	0 min	0 min	0 min	24.0 min	Car: 37.5 mph
8	Travel Time: Trucks	8 min	2 min	18 min	0 min	0 min	0 min	0 min	28.0 min	Truck: 32.0 mph
ŀ	Miles per Roadway	0.0 miles	0.0 miles	0.0 miles	7.7 miles	0.0 miles	10.5 miles	10.9 miles	29.1 miles	
₁	Travel Time: Cars (Google)	0 min	0 min	0 min	11 min	0 min	15 min	9 min	34.9 min	Car: 50.0 mph
#	Travel Time: Trucks	0 min	0 min	0 min	12 min	0 min	17 min	10 min	38.2 min	Truck: 45.7 mph
l	Miles per Roadway	0.0 miles	0.0 miles	0.0 miles	0.0 miles	4.3 miles	8.4 miles	0.0 miles	12.7 miles	
#5	Travel Time: Cars (Google)	0 min	0 min	0 min	0 min	8 min	12 min	0 min	20.0 min	Car: 38.1 mph
#	Travel Time: Trucks	0 min	0 min	0 min	0 min	9 min	13 min	0 min	22.7 min	Truck: 33.5 mph
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