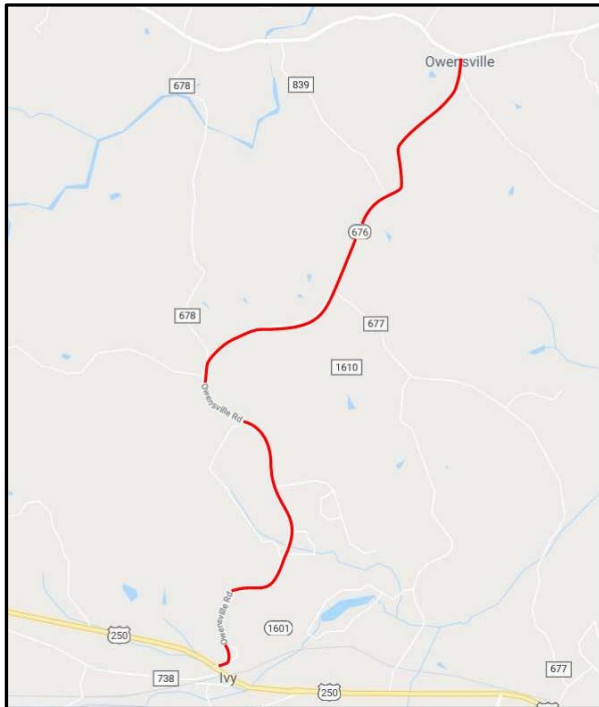


**Through Truck Restriction Study**  
**Owensville Road (Route 676 & Route 678)**  
County of Albemarle  
Date: September 19, 2018



**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 ↔ Owensville Rd ↔ Garth Rd ↔ Woodlands Rd ↔  
Earlysville Rd ↔ Dickerson Rd ↔ Airport Rd ↔ US 29

Length: 15.0 Miles

Total Travel Time: 28 minutes

Average Truck Speed: 32.0 mph



AMT and Associates, Inc.  
Chantilly, Virginia  
Traffic Engineer

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2. Commonwealth Transportation Board (CTB) Criteria
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### Appendix

- 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 “Virginia’s Size, Weight and Equipment Requirements for Trucks Trailers and Towed Vehicles”, 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 either 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 vehicle-miles of travel north of Tilman Road and 229.15 million vehicle-miles 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
    - Collision Types: 23 Fixed Object, 3 Angle, 3 “Other”, 2 Deer-Related 1 Rear-End, 1 Sideswipe, 1 Backed Into
    - Drive Injury Types: 27 Property Damage Only, 11 Non-Incapacitating Injury, 1 Non-Visible Injury
  
- **Garth Road at Owensville Road**
  - 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
    - Drive Injury Types: 6 Property Damage Only, 1 Non-Incapacitating Injury, 1 Non-Visible Injury
  
- **US 250 at Owensville Road**
  - 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.

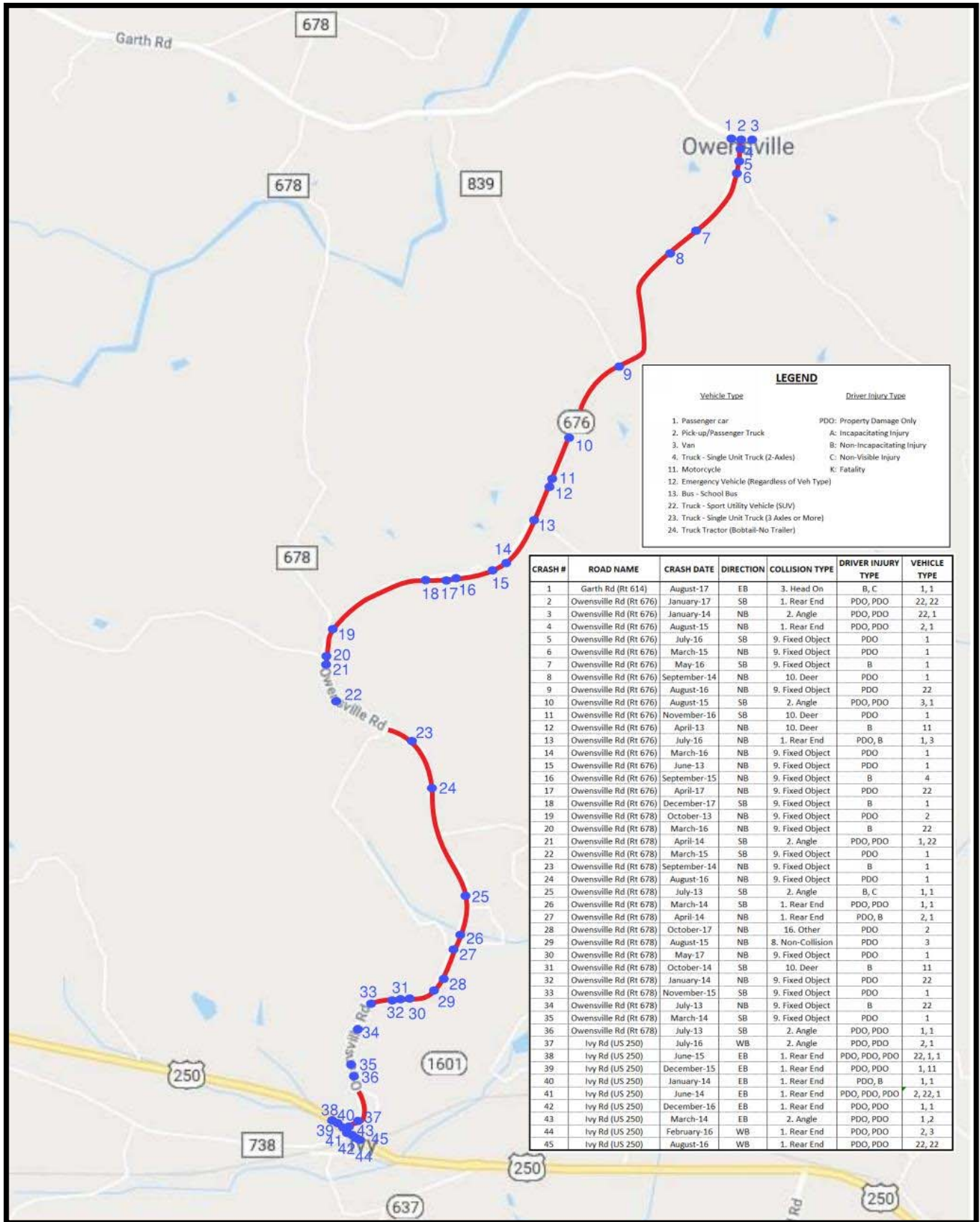


Figure 1: Five-Year Roadway Crash Data - Owensville Road (Route 676 & Route 678)

## 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 *Road Design Manual* (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

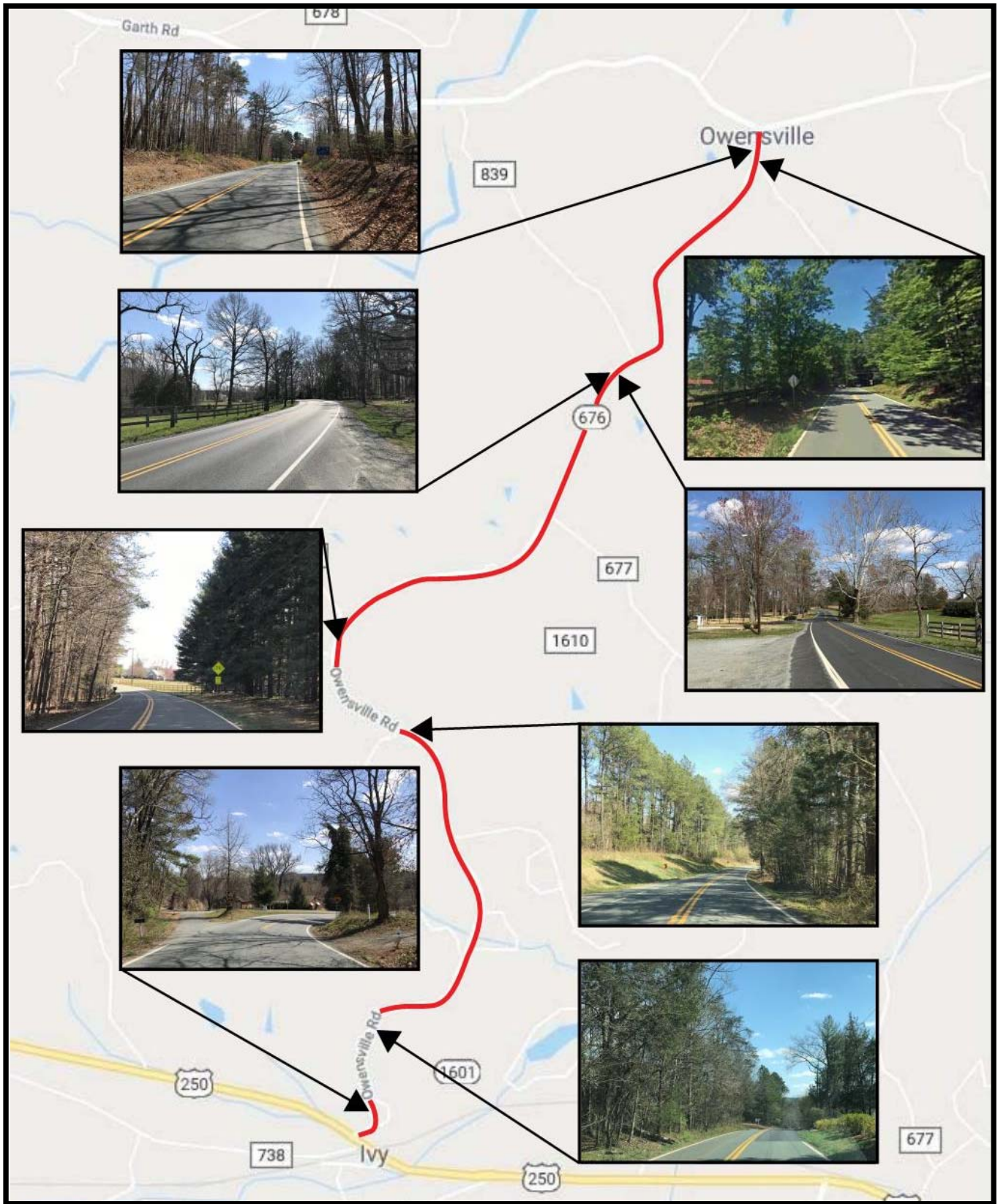


Figure 2: Photographs along Northbound and Southbound Owensville Road



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

Roadway Segment per 1000'	Inventory of Houses North to South	Offset from Centerline		Roadway Segment per 1000'	Inventory of Houses North to South	Offset from Centerline	
		West Side	East Side			West Side	East Side
1	House #1		95'	11	House #55		120'
	House #2	115'			House #56		85'
	House #3		>150'		House #57	145'	
	House #4	50'			House #58	85'	
	House #5		>150'		House #59		120'
	House #6		145'				
	<b>Total within 150'</b>		<b>4 Units</b>		<b>Total within 150'</b>		<b>5 Units</b>
2	House #7	>150'		12	House #60	140'	
	House #8	>150'			House #61	<150'	
	<b>Total within 150'</b>		<b>0 Units</b>		House #62		>150'
					House #63	<150'	
	<b>Total within 150'</b>		<b>1 Unit</b>		<b>Total within 150'</b>		<b>3 Units</b>
3	House #9	>150'		13	House #64		120'
	House #10	>150'			House #65		145'
	House #11	>150'			House #66	145'	
	House #12	>150'					
	House #13	>150'					
	House #14	>150'		14	House #67		120'
	House #15	>150'			House #68		120'
House #16	65'		House #69			>150'	
	<b>Total within 150'</b>		<b>1 Unit</b>	House #70	>150'		
4	House #17	95'		House #71		>150'	
	House #18	85'		House #72	95'		
	House #19	>150'		House #73		95'	
	House #20	>150'					
	House #21	>150'					
	<b>Total within 150'</b>		<b>2 Units</b>		<b>Total within 150'</b>		<b>4 Units</b>
5	House #22	115'		15	House #74		115'
	House #23		100'		House #75	120'	
	House #24	<150'			House #76	70'	
	House #25	<150'			House #77		145'
	House #26	<150'					
	House #27	105'					
	House #28	145'					
	<b>Total within 150'</b>		<b>4 Units</b>		<b>Total within 150'</b>		<b>4 Units</b>
6	House #29	<150'		16	House #78		145'
	House #30		>150'		House #79	145'	
	House #31	<150'			House #80		>150'
	House #32	85'			House #81	145'	
	House #33	90'			House #82		>150'
	House #34	<150'			House #83		>150'
	<b>Total within 150'</b>		<b>2 Units</b>	House #84	145'		
7	House #35	110'		17	House #85		115'
	House #36	<150'			House #86	>150'	
	House #37		95'		House #87		140'
	House #38	<150'			House #88		105'
	House #39		>150'		House #89	100'	
	House #40	145'			House #90		105'
	House #41	<150'					
	House #42		145'				
	<b>Total within 150'</b>		<b>4 Units</b>		<b>Total within 150'</b>		<b>5 Units</b>
8	House #43	<150'		18	House #91	>150'	
	House #44		145'		House #92		85'
	House #45	>150'			House #93		70'
	House #46	110'			House #94	>150'	
	House #47	95'			House #95	>150'	
	<b>Total within 150'</b>		<b>3 Units</b>	House #96		85'	
9	House #48		>150'	19	House #97		75'
	House #49	>150'			House #98	120'	
	House #50		>150'		House #99	130'	
					House #100		60'
	<b>Total within 150'</b>		<b>0 Units</b>	House #101	110'		
10	House #51		135'	House #102	>150'		
	House #52	>150'		House #103	105'		
	House #53		>150'				
	House #54	>150'					
		<b>Total within 150'</b>		<b>1 Unit</b>		<b>Total within 150'</b>	
20	House #55			20	House #104	120'	
	House #56				House #105	110'	
	House #57				House #106	85'	
	House #58				House #107		60'
	House #59				House #108	60'	
	<b>Total within 150'</b>		<b>5 Units</b>		<b>Total within 150'</b>		<b>5 Units</b>

**Table 2**  
**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	(3) (4) MINIMUM WIDTH OF GRADED SHOULDERS		(5) MINIMUM WIDTH OF DITCH FRONT SLOPE	(6) SLOPE	NEW AND RECONSTRUCTED MINIMUM BRIDGE WIDTHS AND VERTICAL CLEARANCES
						FILL W/GR	CUT & FILL			
(1) ADT OVER 2000	LEVEL	60	1204'	570'	12'	12'	8'	10' @ 6:1	CS-4, CS-4A OR CS-4C	See Footnote (7)
	ROLLING	50	760'	425'				6' @ 4:1		
	MOUNTAINOUS	45	589'	360'				CS-3 / CS-3B		
40		446'	305'							
(1) ADT 1500 TO 2000	LEVEL	50	760'	425'	11'	10'	6'	6' @ 4:1	CS-4, CS-4A OR CS-4C	
	ROLLING	45	589'	360'				4' @ 4:1		
		40	446'	305'						
	MOUNTAINOUS	35	316'	250'						
30		215'	200'							
(1) ADT 400 TO 1500	LEVEL	50	760'	425'	11'	(9) 9'	(9) 5'	6' @ 4:1	CS-4, CS-4A OR CS-4C	
	ROLLING	45	589'	360'				4' @ 4:1		CS-3/ CS-3B
		40	446'	305'						
	MOUNTAINOUS	35	316'	250'						
30		215'	200'							
CURRENT ADT UNDER 400	LEVEL	45	589'	360'	10'	8'	2'	6' @ 4:1	CS-1	
		40	446'	305'						
	ROLLING	35	316'	250'						
		30	215'	200'						
	MOUNTAINOUS	25	135'	155'						
		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.

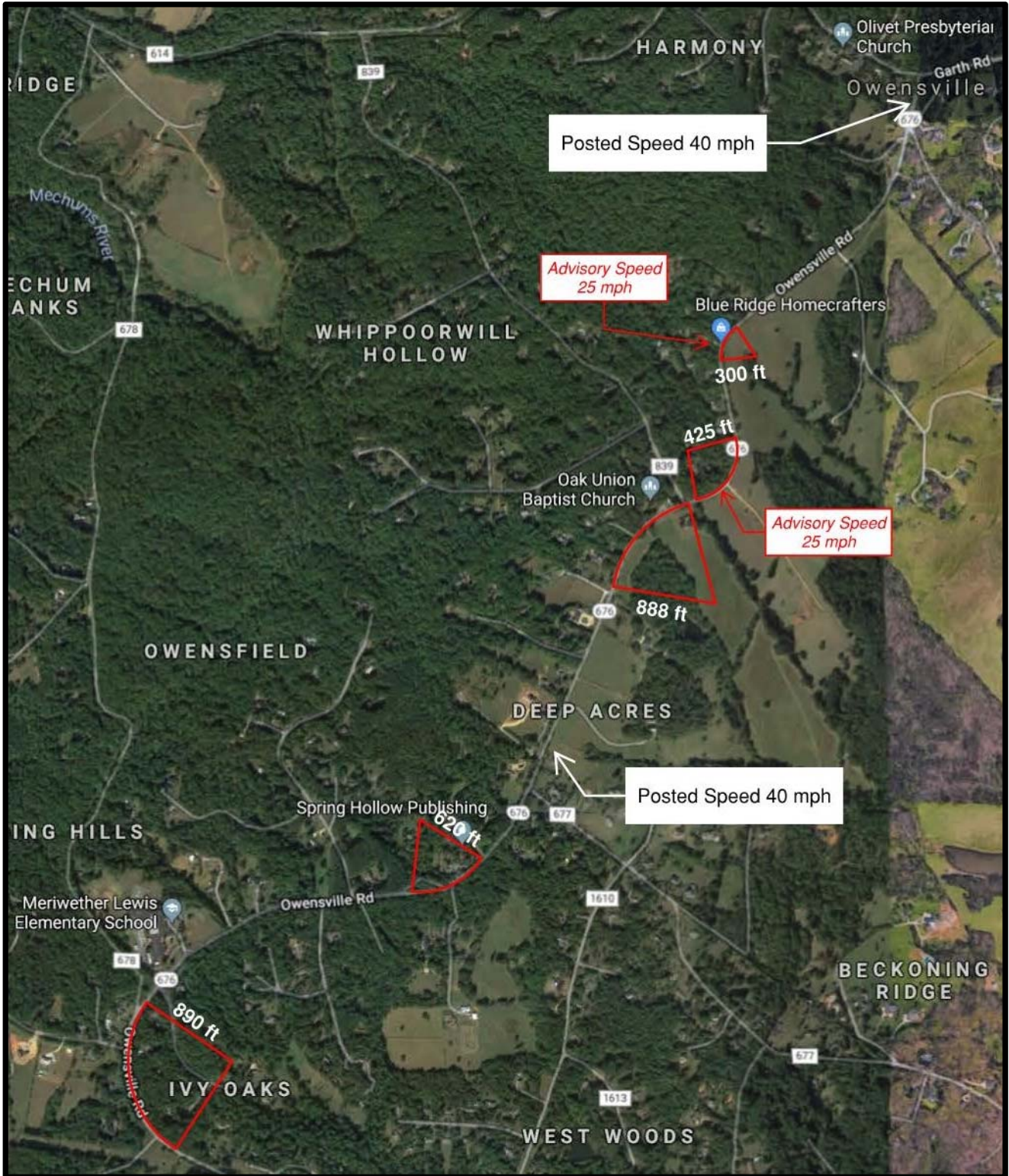


Figure 3: Curve Measurements along Owensville Road (Curves 5 of 8)

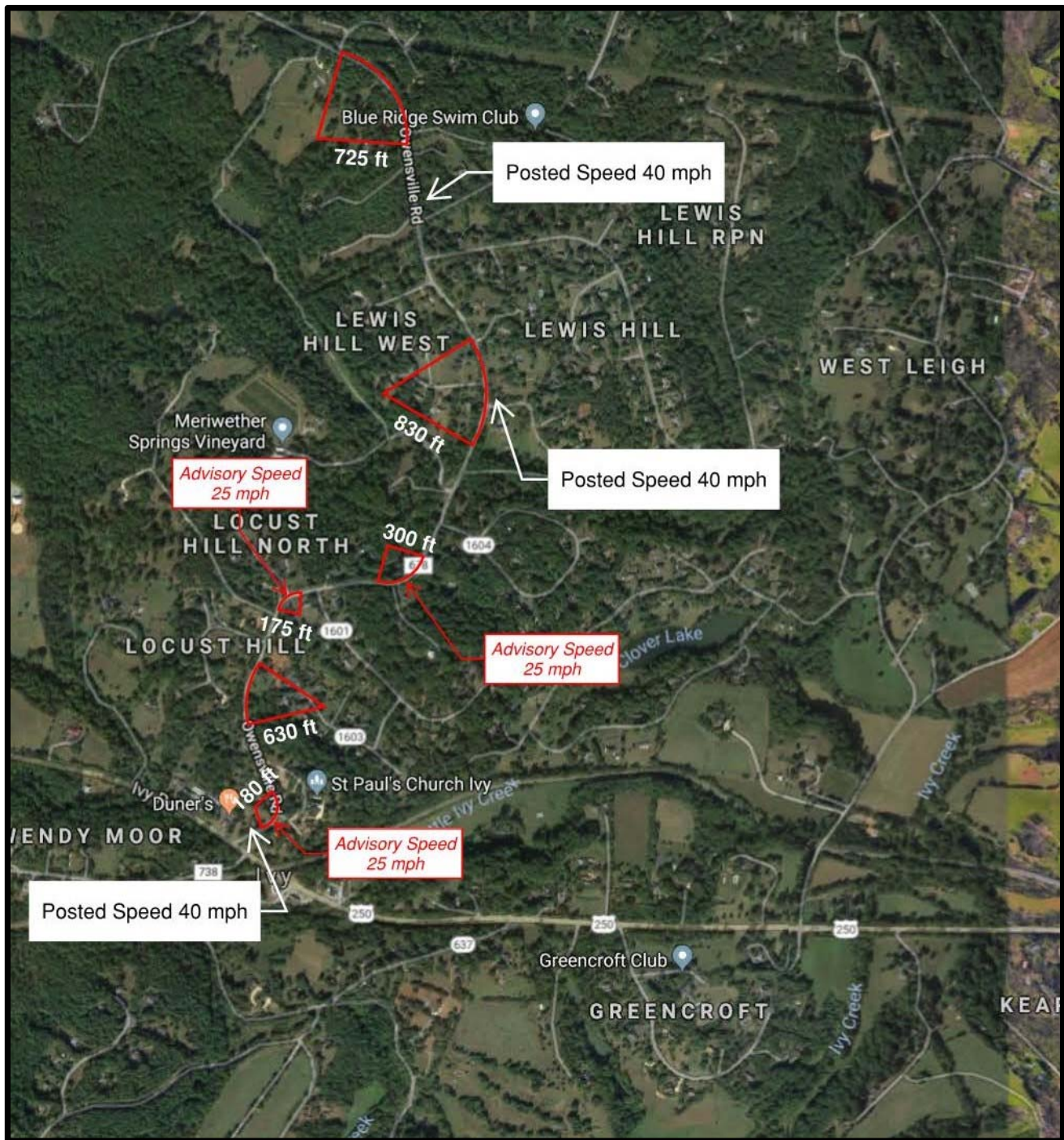


Figure 4: Curve Measurements along Owensville Road (Curves 6 through 11)



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*

- Length: 15.0 Miles
- Average Truck Speed: 32.0 mph
- Total Travel Time: 28 minutes

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

- Length: 29.1 Miles
- Average Truck Speed: 45.7 mph
- Total Travel Time: 38.2 minutes ( $\Delta + 10.2$  minutes)

- **Alternate Truck Route #2:** *US 250 ↔ US 29/250 ↔ US 29*

- Length: 12.7 Miles
- Average Truck Speed: 33.5 mph
- Total Travel Time: 22.7 minutes ( $\Delta - 5.3$  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*

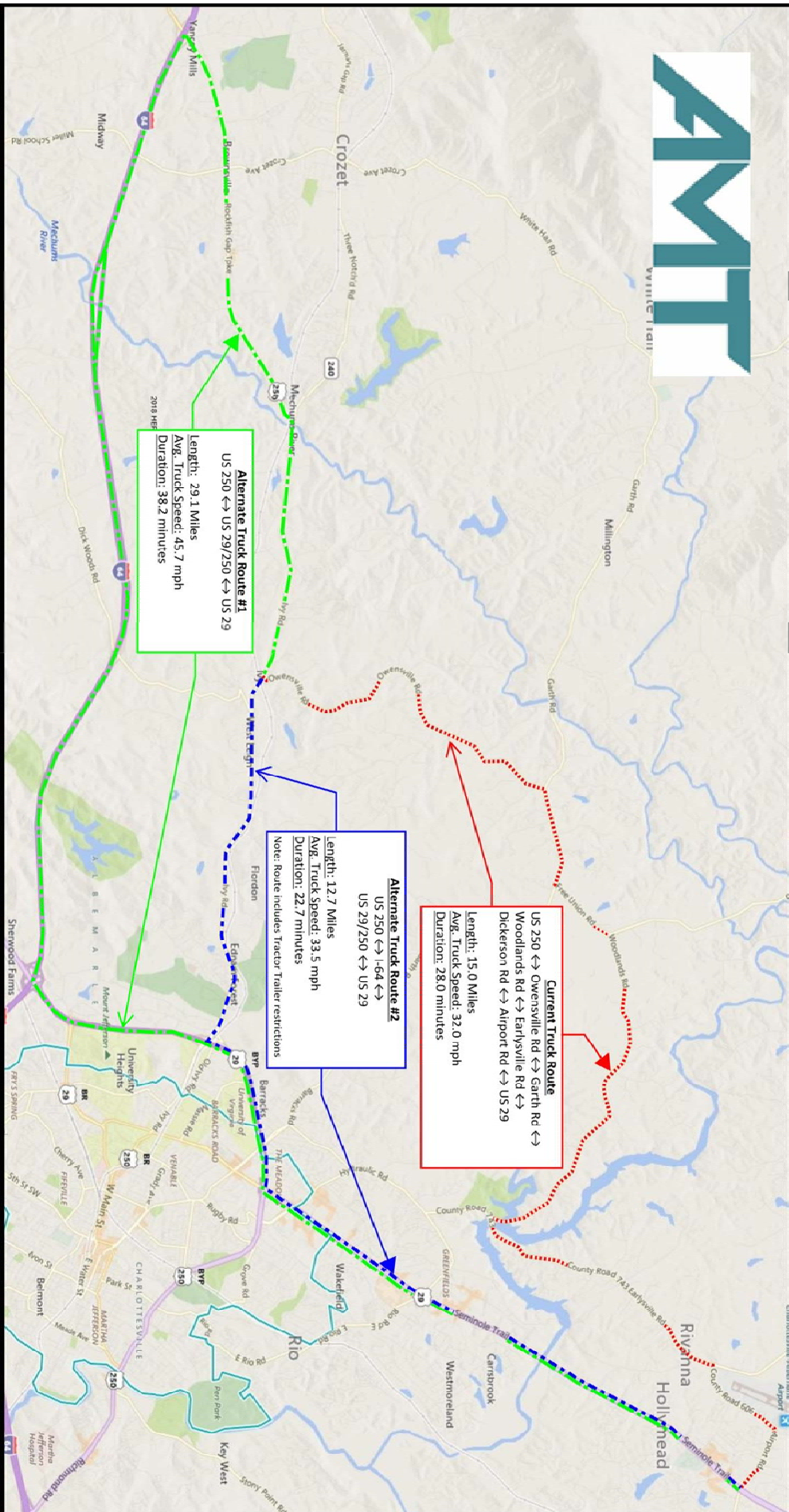



Figure 6: Owensville Road Alternative Truck Routes

## 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:

 **Criteria #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.*


**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.*

 **Criteria #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.*



**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 vehicle-miles 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.*

-  Criteria #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.*

**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.*

-  Criteria #4: *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)**

Job No.: 17-0013.003  
 Location: Owensville Rd at Garth Rd (Rte 614)  
 Date: 3/14/2018 & 3/15/2018  
 Recorder: AMT  
 Interval (dd): 15 (in Minutes)  
 State: Virginia  
 Town: Charlottesville  
 Weather:

PEAK HOURS	AM PERIOD				PM PERIOD			
	Start	End	Volume	Start	End	Volume		
	12:00AM-12:00PM	07:30	08:30	631	12:00PM-12:00AM	17:15	18:15	603

Street Name->	Owensville Rd																				Garth Rd (Rte 614)					Garth Rd (Rte 614)					GRAND TOTAL					
	From North					From South					From East					From West																				
	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total																
DAY 1- 3/14/18																																				
00:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1										
00:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2										
00:45	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2										
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
01:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2										
01:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0										
02:00	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	1										
02:45	0	0	0	0	0	0	0	0	0	0	0	0	0	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	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1										
03:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
03:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2										
03:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
04:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1										
04:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
04:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
05:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2										
05:30	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3										
05:45	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4										
06:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	2										
06:15	0	0	0	0	0	0	0	0	0	0	0	4	4	0	8	0	0	0	0	0	0	0	0	0	0	8										
06:30	0	0	0	0	0	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	4										
06:45	0	0	0	0	0	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	5										
07:00	0	0	0	0	0	0	0	0	0	0	0	7	3	0	10	0	0	0	0	0	0	0	0	0	0	10										
07:15	0	0	0	0	0	0	0	0	0	0	0	10	8	0	18	0	0	0	0	0	0	0	0	0	0	18										
07:30	0	0	0	0	0	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	0	0	0	0	16										
07:45	0	0	0	0	0	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	0	0	0	0	16										
08:00	0	0	0	0	0	0	0	0	0	0	0	34	34	0	68	0	0	0	0	0	0	0	0	0	0	68										
08:15	0	0	0	0	0	0	0	0	0	0	0	68	72	0	140	0	0	0	0	0	0	0	0	0	0	140										
08:30	0	0	0	0	0	0	0	0	0	0	0	24	35	0	59	0	0	0	0	0	0	0	0	0	0	59										
08:45	0	0	0	0	0	0	0	0	0	0	0	19	17	0	36	0	0	0	0	0	0	0	0	0	0	36										
09:00	0	0	0	0	0	0	0	0	0	0	0	23	13	0	36	0	0	0	0	0	0	0	0	0	0	36										
09:15	0	0	0	0	0	0	0	0	0	0	0	21	27	0	48	0	0	0	0	0	0	0	0	0	0	48										
09:30	0	0	0	0	0	0	0	0	0	0	0	26	21	0	47	0	0	0	0	0	0	0	0	0	0	47										
09:45	0	0	0	0	0	0	0	0	0	0	0	10	19	0	29	0	0	0	0	0	0	0	0	0	0	29										
10:00	0	0	0	0	0	0	0	0	0	0	0	12	14	0	26	0	0	0	0	0	0	0	0	0	0	26										
10:15	0	0	0	0	0	0	0	0	0	0	0	10	17	0	27	0	0	0	0	0	0	0	0	0	0	27										
10:30	0	0	0	0	0	0	0	0	0	0	0	9	10	0	19	0	0	0	0	0	0	0	0	0	0	19										
10:45	0	0	0	0	0	0	0	0	0	0	0	11	17	0	28	0	0	0	0	0	0	0	0	0	0	28										
11:00	0	0	0	0	0	0	0	0	0	0	0	14	19	0	33	0	0	0	0	0	0	0	0	0	0	33										
11:15	0	0	0	0	0	0	0	0	0	0	0	12	13	0	25	0	0	0	0	0	0	0	0	0	0	25										
11:30	0	0	0	0	0	0	0	0	0	0	0	12	23	0	35	0	0	0	0	0	0	0	0	0	0	35										
11:45	0	0	0	0	0	0	0	0	0	0	0	17	17	0	34	0	0	0	0	0	0	0	0	0	0	34										
12:00	0	0	0	0	0	0	0	0	0	0	0	14	15	0	29	0	0	0	0	0	0	0	0	0	0	29										
12:15	0	0	0	0	0	0	0	0	0	0	0	20	16	0	36	0	0	0	0	0	0	0	0	0	0	36										
12:30	0	0	0	0	0	0	0	0	0	0	0	12	10	0	22	0	0	0	0	0	0	0	0	0	0	22										
12:45	0	0	0	0	0	0	0	0	0	0	0	22	32	0	54	0	0	0	0	0	0	0	0	0	0	54										
13:00	0	0	0	0	0	0	0	0	0	0	0	21	30	0	51	0	0	0	0	0	0	0	0	0	0	51										
13:15	0	0	0	0	0	0	0	0	0	0	0	12	12	0	24	0	0	0	0	0	0	0	0	0	0	24										
13:30	0	0	0	0	0	0	0	0	0	0	0	29	29	0	58	0	0	0	0	0	0	0	0	0	0	58										
13:45	0	0	0	0	0	0	0	0	0	0	0	23	26	0	49	0	0	0	0	0	0	0	0	0	0	49										
14:00	0	0	0	0	0	0	0	0	0	0	0	12	24	0	36	0	0	0	0	0	0	0	0	0	0	36										
14:15	0	0	0	0	0	0	0	0	0	0	0	15	13	0	28	0	0	0	0	0	0	0	0	0	0	28										
14:30	0	0	0	0	0	0	0	0	0	0	0	23	31	0	54	0	0	0	0	0	0	0	0	0	0	54										
14:45	0	0	0	0	0	0	0	0	0	0	0	25	30	0	55	0	0	0	0	0	0	0	0	0	0	55										
15:00	0	0	0	0	0	0	0	0	0	0	0	24	24	0	48	0	0	0	0	0	0	0	0	0	0	48										
15:15	0	0	0	0	0	0	0	0	0	0	0	16	28	0	44	0	0	0	0	0	0	0	0	0	0	44										
15:30	0	0	0	0	0	0	0	0	0	0	0	24	38	0	62	0	0	0	0	0	0	0	0	0	0	62										
15:45	0	0	0	0	0	0	0	0	0	0	0	31	35	0	66	0	0	0	0	0	0	0	0	0	0	66										
16:00	0	0	0																																	





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

Job No.: 17-0013.003  
 Location: Owensville Rd at Ivy Rd (Rte 250)  
 Date: 3/14/2018 & 3/15/2018  
 Recorder: AMT  
 Interval (dd): 15 (in Minutes)  
 State: Virginia  
 Town: Charlottesville  
 Weather:

PEAK HOURS	AM PERIOD			PM PERIOD		
	12:00AM-12:00PM	Start 07:30	End 08:30	12:00PM-12:00AM	Start 17:15	End 18:15
		Volume	1291		Volume	1512

Street Name->	Owensville Rd					Ivy Rd (Rte 250)					Ivy Rd (Rte 250)					GRAND TOTAL					
	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total						
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	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	8	0	8	14
00:45	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	3	0	3	6
01:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	4	0	4	8
01:15	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	0	0	3	0	3	6
01:30	0	0	0	1	1	0	0	0	0	0	0	0	1	1	2	0	1	1	0	2	5
01:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	0	2	3
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	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	3
02:30	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
03:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	2	0	2	4
03:30	0	0	0	0	0	0	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	1	0	1	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	2
04:15	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	0	0	6	0	6	9
04:30	0	1	0	0	1	0	0	0	0	0	0	0	4	0	4	0	1	3	0	4	9
04:45	0	1	0	0	1	0	0	0	0	0	0	0	4	0	4	0	1	10	0	11	16
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	8
05:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	15
05:30	0	4	0	0	4	0	0	0	0	0	0	0	1	0	1	0	1	23	0	24	29
05:45	0	2	0	0	2	0	0	0	0	0	0	0	2	0	2	0	31	0	0	31	37
06:00	0	9	0	0	9	0	0	0	0	0	0	0	5	0	5	0	11	24	0	24	40
06:15	0	6	0	0	6	0	0	0	0	0	0	0	5	0	5	0	0	36	0	36	47
06:30	0	3	0	0	3	0	0	0	0	0	0	0	10	0	10	0	4	63	0	67	86
06:45	0	13	0	0	13	0	0	0	0	0	0	0	17	0	17	0	6	76	0	86	111
07:00	0	20	0	0	20	0	0	0	0	0	0	0	36	4	40	0	2	96	0	102	125
07:15	0	12	0	0	12	0	0	0	0	0	0	0	27	0	27	0	5	120	0	125	151
07:30	0	20	0	0	20	0	0	0	0	0	0	0	46	9	55	0	10	168	0	173	196
07:45	0	29	0	0	29	0	0	0	0	0	0	0	53	17	70	0	14	99	0	213	238
08:00	0	36	0	0	36	0	0	0	0	0	0	0	64	14	78	0	14	196	0	210	251
08:15	0	23	0	0	23	0	0	0	0	0	0	0	58	5	63	0	16	157	0	173	224
08:30	0	18	0	0	18	0	0	0	0	0	0	0	87	14	101	0	14	170	0	184	240
08:45	0	23	0	0	23	0	0	0	0	0	0	0	57	12	69	0	11	154	0	165	194
09:00	0	17	0	0	17	0	0	0	0	0	0	0	84	12	96	0	11	154	0	155	207
09:15	0	27	0	0	27	0	0	0	0	0	0	0	62	7	69	0	17	137	0	154	176
09:30	0	6	0	0	6	0	0	0	0	0	0	0	72	8	80	0	13	129	0	142	173
09:45	0	18	0	0	18	0	0	0	0	0	0	0	43	11	54	0	11	130	0	141	175
10:00	0	13	0	0	13	0	0	0	0	0	0	0	50	5	55	0	5	85	0	100	150
10:15	0	14	0	0	14	0	0	0	0	0	0	0	55	5	60	0	8	89	0	97	179
10:30	0	16	0	0	16	0	0	0	0	0	0	0	96	7	103	0	15	99	0	114	203
10:45	0	11	0	0	11	0	0	0	0	0	0	0	60	14	74	0	15	117	0	122	153
11:00	0	8	0	0	8	0	0	0	0	0	0	0	53	17	70	0	11	89	0	100	187
11:15	0	8	0	0	8	0	0	0	0	0	0	0	88	11	99	0	8	74	0	82	181
11:30	0	24	0	0	24	0	0	0	0	0	0	0	60	15	75	0	60	73	0	95	204
11:45	0	19	0	0	19	0	0	0	0	0	0	0	72	10	82	0	10	98	0	108	221
12:00	0	14	0	0	14	0	0	0	0	0	0	0	93	17	110	0	9	76	0	85	215
12:15	0	13	0	0	13	0	0	0	0	0	0	0	83	15	98	0	17	77	0	88	205
12:30	0	16	0	0	16	0	0	0	0	0	0	0	95	24	119	0	8	83	0	81	236
12:45	0	8	0	0	8	0	0	0	0	0	0	0	84	22	106	0	13	74	0	87	210
13:00	0	15	0	0	15	0	0	0	0	0	0	0	98	18	116	0	14	80	0	84	213
13:15	0	13	0	0	13	0	0	0	0	0	0	0	85	8	93	0	13	70	0	83	196
13:30	0	12	0	0	12	0	0	0	0	0	0	0	70	15	85	0	8	64	0	72	181
13:45	0	6	0	0	6	0	0	0	0	0	0	0	96	17	113	0	9	60	0	69	195
14:00	0	12	0	0	12	0	0	0	0	0	0	0	98	15	113	0	18	80	0	78	214
14:15	0	13	0	0	13	0	0	0	0	0	0	0	93	15	108	0	12	82	0	94	220
14:30	0	23	0	0	23	0	0	0	0	0	0	0	92	16	108	0	9	60	0	69	196
14:45	0	23	0	0	23	0	0	0	0	0	0	0	88	22	110	0	12	87	0	99	249
15:00	0	19	0	0	19	0	0	0	0	0	0	0	97	17	114	0	11	89	0	100	237
15:15	0	16	0	0	16	0	0	0	0	0	0	0	110	13	123	0	5	65	0	70	224
15:30	0	9	0	0	9	0	0	0	0	0	0	0	121	8	129	0	5	76	0	80	230
15:45	0	16	0	0	16	0	0	0	0	0	0	0	117	15	132	0	16	83	0	90	268
16:00	0	15	0	0	15	0	0	0	0	0	0	0	126	20	146	0	11	79	0	90	275
16:15	0	14	0	0	14	0	0	0	0	0	0	0	132	19	151	0	20	88	0	109	285
16:30	0	14	0	0	14	0	0	0	0	0	0	0	157	23	180	0	30	86	0	116	323
16:45	0	23	0	0	23	0	0	0	0	0	0	0	153	24	177	0	20	82	0	102	313
17:00	0	18	0	0	18	0	0	0	0	0	0	0	176	24	200	0	17	70	0	87	351
17:15	0	17	0	0	17	0	0	0	0	0	0	0	197	24	221	0	20	76	0	96	349
17:30	0	14	0	0	14	0	0	0	0	0	0	0	220	26	246	0	14	67	0	81	373
17:45	0	11	0	0	11	0	0	0	0	0	0	0	200	16	216	0	18	77	0	90	370
18:00	0	14	0	0	14	0	0	0	0	0	0	0	242	22	264	0	14	69	0	83	405
18:15	0	11	0	0	11	0	0	0	0	0	0	0	202	28	230	0	22	80	0	102	364
18:30	0	14	0	0	14	0	0	0	0	0	0	0	233	21	254	0	18	65	0	83	363
18																					





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

Job No.: 17-0013.003  
 Location: Owensville Rd at Ivy Rd (Rte 250)  
 Date: 3/14/2018 & 3/15/2018  
 Recorder: AMT  
 Interval (dd): 15  
 (In Minutes)

State: Virginia  
 Town: Charlottesville  
 Weather:

PEAK HOURS	AM PERIOD				PM PERIOD			
	Start	End	Volume	Start	End	Volume		
	12:00AM	12:00PM	6	12:00PM	12:00AM	2		

Street Name->	Owensville Rd					Ivy Rd (Rte 250)					Ivy Rd (Rte 250)					GRAND TOTAL					
	From North					From South					From East						From West				
	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total	U turn	Left	Through	Right	Total		U turn	Left	Through	Right	Total
DAY 1: 3/14/18																					
00:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00:30	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15	0	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	0	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	0	0
02:00	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0
02:30	0	0	0	0	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	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	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
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	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	0	0	0	0	0	0	0	0	0	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	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	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	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	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
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15	0	0	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	0											

# 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

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

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**

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

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

<b>Average Speed - Google Maps</b>	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		
<b>Speed Reduction for Trucks</b>	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		
	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		
	Posted 40 mph	Posted 50 mph (45 trucks)	Posted 45 mph	Posted 45 mph	Posted 45 mph	Posted 60 mph	Posted 70 mph		
	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
VDOT Classification	Major Collector	Major Collector	Major Collectors	Minor Arterial	Minor Arterial	Principal Arterial	Interstate		
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	
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
Travel Time: Trucks	8 min	2 min	18 min	0 min	0 min	0 min	0 min	28.0 min	Truck: 32.0 mph
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	
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
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	
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

Alternative - Alternative #1  
Alternative - Alternative #2