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VDOT Virginia Department of Transportation

Increasing Safety and Capacity

Blairs Fire Station and Route 29

Planning Level Study

West Piedmont Planning District Commission and Danville Metropolitan Planning Organization

June 2014

SUBMITTED TO:

West Piedmont Planning District Commission and Danville Metropolitan Planning Organization
P.O. Box 5268
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Blairs Fire Station and Route 29 – Planning Level Study

FINAL REPORT

Danville, Virginia

June 20, 2014

Prepared for:
West Piedmont Planning District Commission and
Danville Metropolitan Planning Organization

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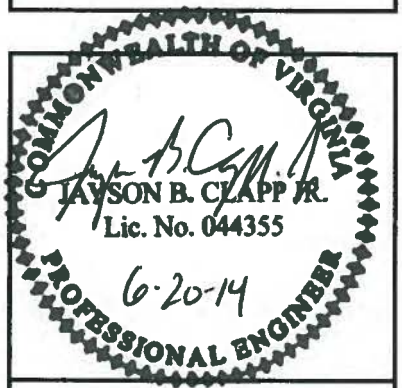

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Executive Summary

Dewberry Engineers Inc. (Dewberry) and Ramey Kemp & Associates Inc. (RKA) have completed the Blairs Fire Station and Route 29 improvements study for the West Piedmont Planning District Commission (WPPDC) and the Danville Pittsylvania Metropolitan Planning Organization (MPO) in cooperation with the Virginia Department of Transportation (VDOT) and Pittsylvania County. The intent of this study is to evaluate improvements and development access along Route 29 between the intersections with Woodcrest Drive/Spring Garden Road (Routes 1702/640) and Malmaison Road (Route 726), and examine access improvements for the existing Blairs Fire Station. Below is a summary of the conclusions and recommendations from this study.

1. Based on the analysis within this report, it is expected that due to the expected growth of this area and the existing system performance, improvements to the existing roadway and associated intersections, as well as access to and from the Blairs Fire Station, should be identified.

2. To deal with these deficiencies, three (3) alternatives for improvements have been identified. There are several general spot improvements constant throughout all of the alternatives to better improve system performance and safety. The specific alternatives, each focused in on the intersection of Route 29 and The Arc (North), are listed below:
   a. Alternative 1 - Right in/right out at the intersection of Route 29 and The Arc (North).
      i. Closing of the southbound left turn lane and crossover on Route 29 in order to limit access at the intersection to right in/right out only.
      ii. Addition of a northbound right turn lane on Route 29.
      iii. Construction of a proposed frontage road from the Blairs Fire Station to access at intersection of Route 29 at The Arc (North) and Spring Garden Road.
      iv. Addition of dual left turn lanes on the westbound approach at the intersection of Route 29 and Spring Garden.
      v. Installation of a traffic signal at the intersection of Route 29 and Spring Garden Road.
   b. Alternative 2 - Leftovers at the intersection of Route 29 and The Arc (North).
      i. Installation of left turn lanes with a non-traversable median.
      ii. Addition of a northbound right turn lane on Route 29.
      iii. Installation of signal ahead warning sign with flashing beacons on Route 29 and the flyover from Business 29.
      iv. Construction of a proposed frontage road from the Blairs Fire Station to access at intersection of Route 29 at The Arc (North) and Spring Garden Road.
      v. Addition of dual left turn lanes on the westbound approach at the intersection of Route 29 and Spring Garden.
      vi. Installation of traffic signalization at both the intersection of Route 29 at The Arc (North) and Woodcrest Drive/Spring Garden Road.
   c. Alternative 3 - Full access at the intersection of Route 29 and The Arc (North).
      i. Extension of southbound left turn lane and installation of an additional southbound left turn lane.

ii. Addition of northbound left and right turn lanes on Route 29.
iii. Construction of right and dual left turn lanes on the westbound approach of The Arc (North).
iv. Installation of signal ahead warning sign with flashing beacons on Route 29 and the flyover from Business 29.
v. Construction of a proposed frontage road from the Blairs Fire Station to access at intersection of Route 29 at The Arc (North) and Spring Garden Road.
vi. Addition of a left turn lane on the westbound approach at the intersection of Route 29 and Spring Garden.
vii. Installation of traffic signalization at both the intersection of Route 29 at The Arc (North) and Woodcrest Drive/Spring Garden Road.

3. The alternatives were evaluated using eight (8) criteria and analyzed per the weighted criteria. The key advantage to each alternative is listed below.
   a. Alternative 1: The safety of the intersection will slightly improve by restricting access to a right in/right out.
   b. Alternative 2: Intersection handling capacity and safety slightly improves with the addition of a non-traversable median.
   c. Alternative 3: Improves the capacity, safety, and overall system performance, while providing easy access to and from the Blairs Fire Station.

4. Through the implementation of these alternatives, the system performance, safety concerns, and emergency response time will improve.

BLAIRS FIRE STATION AND ROUTE 29 – PLANNING LEVEL STUDY

I. INTRODUCTION

Dewberry Engineers Inc. (Dewberry) and Ramey Kemp & Associates Inc. (RKA) have completed the Blairs Fire Station and Route 29 improvements study for the West Piedmont Planning District Commission (WPPDC) and the Danville Pittsylvania Metropolitan Planning Organization (MPO) in cooperation with the Virginia Department of Transportation (VDOT) and Pittsylvania County. The intent of this study is to evaluate improvements and development access along Route 29 between the intersections with Woodcrest Drive/Spring Garden Road (Routes 1702/640) and Malmaison Road (Route 726), and examine access improvements for the existing Blairs Fire Station.

This section of Route 29 is located in Pittsylvania County just north of Danville in the Blairs community. See Figure 1 for the locations of Route 29 and the limits of the analysis. The section, located in Pittsylvania County between the intersections at Spring Garden Road and Malmaison Road, was not identified for improvement within the *Year 2035 Long Range Transportation Plan*. Therefore, for the purposes of this study, it is anticipated that Route 29 will remain a four-lane divided highway.

This study will provide the WPPDC, the MPO, and local governments with a planning level document detailing multiple alternatives for improving the safety and capacity of Route 29 for the Year 2035. In order to determine these alternatives, the following is addressed within this study:

1. Identification of the Existing Conditions;
2. Discussion of Possible Environmental Constraints;
3. Review of Existing Traffic Safety;
4. Analysis of the No Build Alternative;
5. Statement of Purpose and Need;
6. Improvement Alternatives

II. EXISTING TRAFFIC CONDITIONS

A description of each existing road within the study area is listed below.

Route 29 is classified as a Rural Other Principal Arterial from the intersection at Woodcrest Drive/Spring Garden Road until Route 29 meets with the Danville Expressway. It is classified as a Rural Minor Arterial from the Danville Expressway to the end of the project limits just past the intersection at Malmaison Road. The posted speed limit along this road is 60 miles per hour (MPH) north of the Danville Expressway and 45 MPH south of the Danville Expressway in the vicinity of Malmaison Road. The road typical section includes a four (4) lane divided roadway (two lanes each direction) with lane widths of 12 feet. The horizontal and vertical alignments follow the natural terrain.

Spring Garden Road is classified as a Rural Major Collector with a posted speed limit of 55 miles per hour. The road typical section includes a two (2) lane roadway with lane widths of 10 feet. The horizontal alignment follows the natural terrain. The vertical alignment generally approximates the adjacent rolling terrain with limited to no passing zones.

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BLAIRS (RTE. 29) VICINITY MAP AND PROJECT LIMITS
PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
1

Malmaison Road is classified as a Rural Major Collector with a posted speed limit of 45 miles per hour. Within our limits between Route 29 Business and Hunters Lane, the road typical section includes a four (4) lane divided roadway (two lanes each direction) with lane widths of 12 feet. After this point, the road transitions into two lanes. The horizontal alignment follows the natural terrain with a rolling vertical alignment.

Georges Lane is a two-way rural road with a posted speed limit of 25 miles per hour. The road typical section includes two (2) lanes with a lane width of 8 feet. The shoulders along this road are limited. The horizontal alignment follows the natural terrain.

The Arc of Southside has two full access entrances onto Route 29.

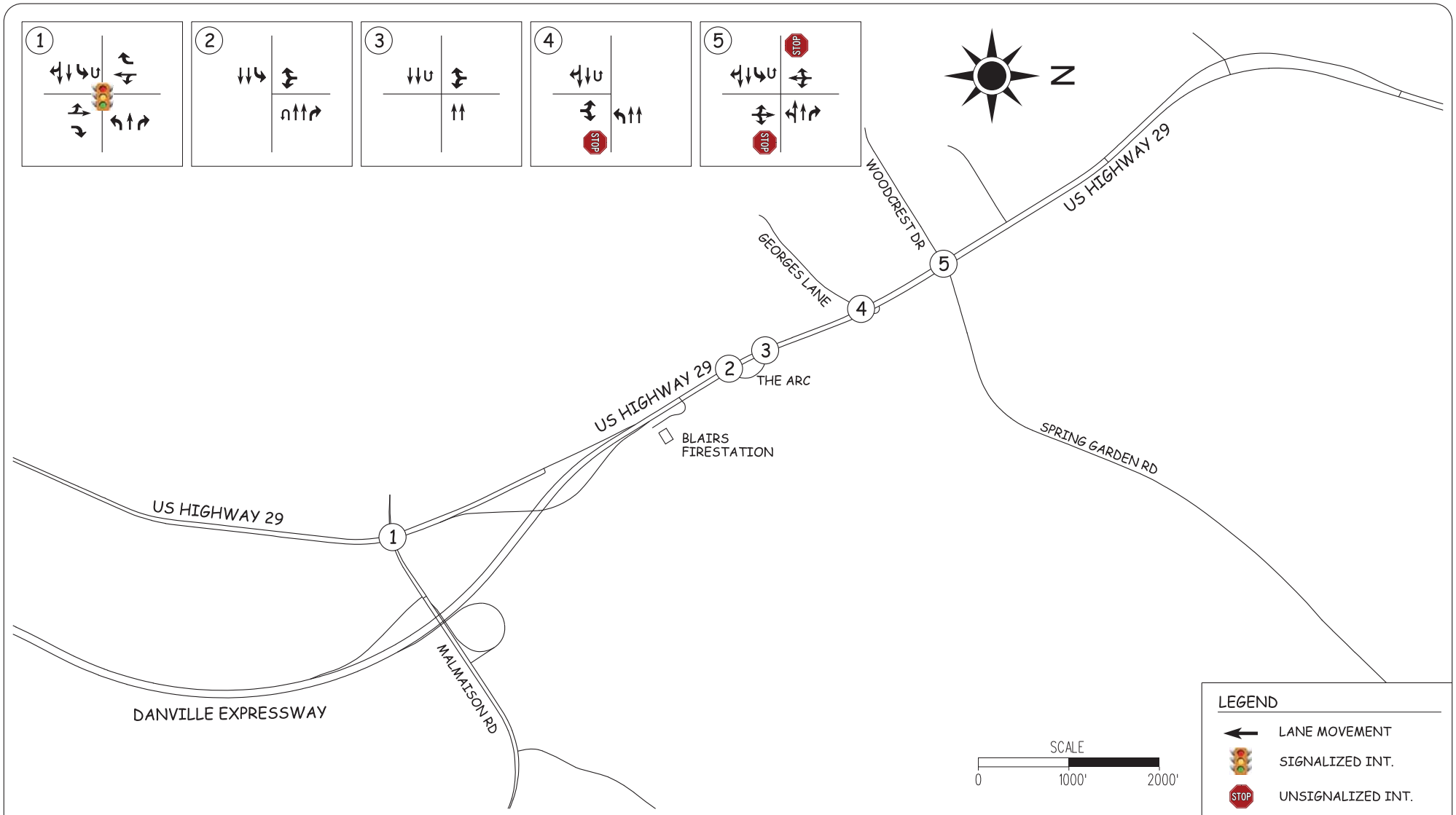
Existing Roadway Volumes and Level of Service

To determine the peak hour volumes within the study area, turning movement counts for the AM and PM peak periods were conducted by Quality Counts on September 17th, 2013 and are included in Appendix A for reference. A review of the traffic counts indicates the AM and PM peak hours occurred at roughly the same times at each intersection, with the peak 15 minute occurring between 7:30 to 7:45 AM and 5:15 to 5:30 PM at almost all intersections . The turning movement counts were taken at the following intersections.

1. Route 29 and Woodcrest Drive/Spring Garden Road
2. Route 29 and Georges Lane
3. Route 29 and The Arc (North Drive)
4. Route 29 and The Arc (South Drive)
5. Route 29 Business and Malmaison Road

The existing intersection geometry and traffic control devices are presented in Figure 2; and the existing (2013) traffic volumes are presented in Figure 3.

Using the existing traffic volumes shown in Figure 3 the existing levels of service were determined for each intersection.



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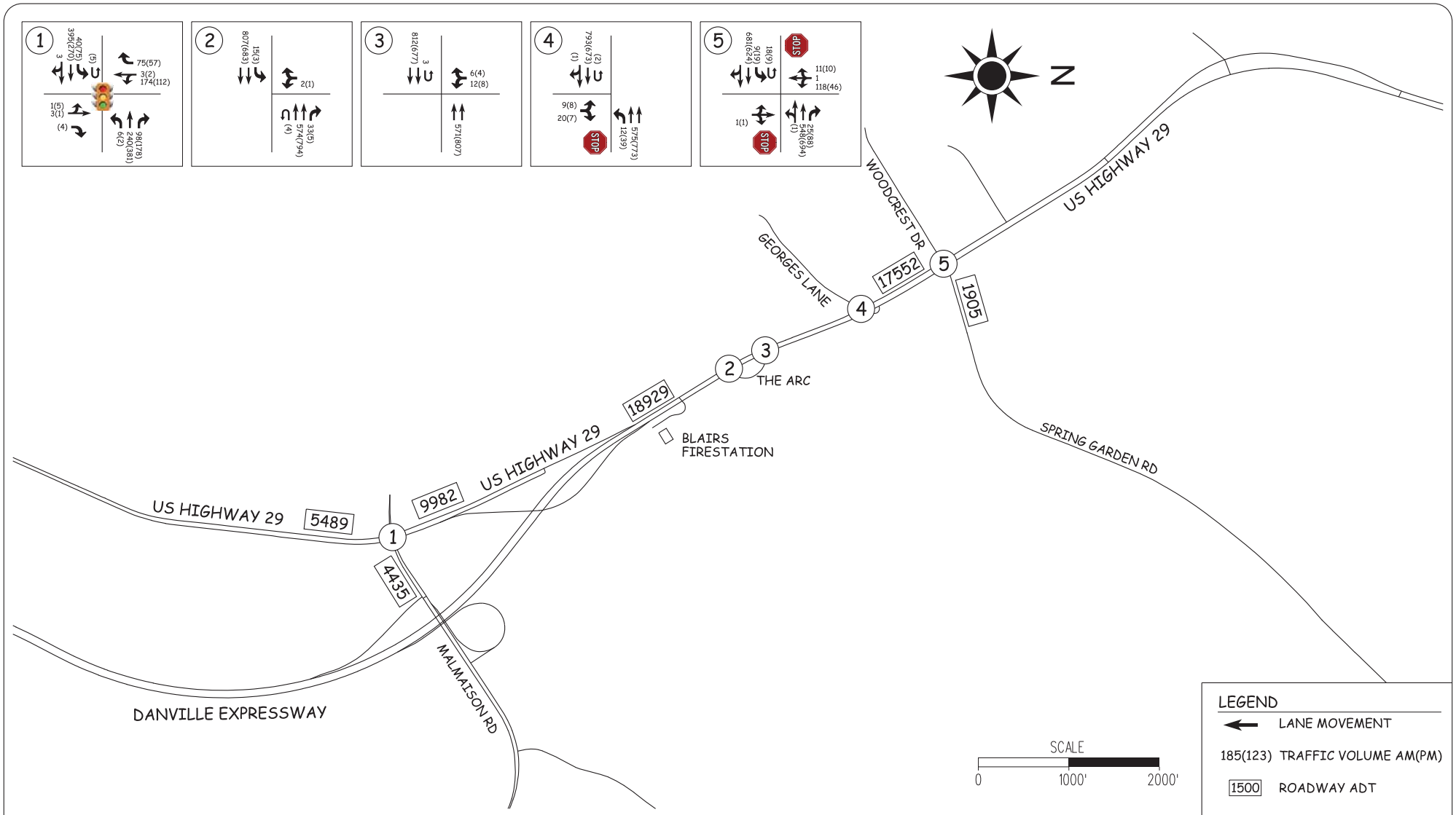
BLAIRS (RTE. 29) EXISTING GEOMETRY AND TRAFFIC CONTROL
PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
2



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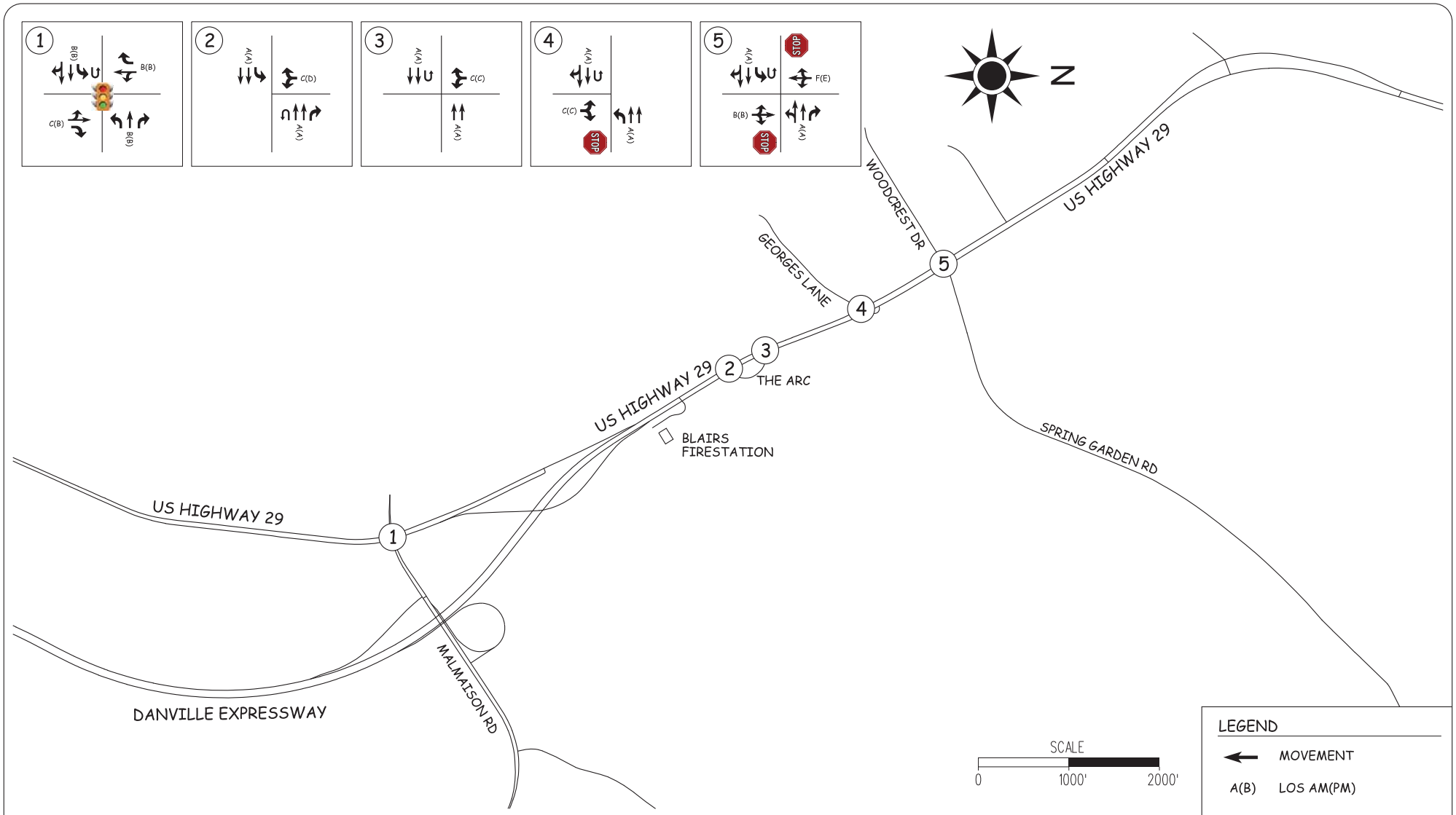
BLAIRS (RTE. 29) EXISTING TRAFFIC VOLUMES AM AND PM PEAK HOUR

PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
3



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BLAIRS (RTE. 29) EXISTING LOS AM AND PM PEAK HOUR
PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
4

The levels of service for each intersection are shown in Figure 4. As can be seen in this figure, most approaches currently operate at acceptable levels of service. The westbound approach at the intersection of Route 29 and Woodcrest Drive/Spring Garden Road has an existing LOS F and E for the AM and PM peak hours, respectively. The westbound approach at the intersection of Route 29 and The Arc (South Drive) currently operates at LOS C and D for the AM and PM peak hours. Each of these intersections do not meet an acceptable level of service, therefore it is necessary to examine alternative improvements. It should also be noted that the intersections of Route 29 and Georges Lane, and Route 29 and The Arc (North Drive) show an existing LOS C in the AM and PM peak hour on the eastbound or westbound approaches. Although each approach currently meets an acceptable level of service, consideration for improvements is necessary for future conditions. Table I below also shows the existing Levels of Service for each intersection.

Table I
Year 2013 – Existing Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and Woodcrest Drive/Spring Garden Road	Unsignalized	EB	B	10.9	B	10.5
		WB	F	86.2	E	39.2
		NB	A	0.0	A	8.9
		SB	A	9.0	A	9.7
Route 29 and Georges Lane	Unsignalized	EB	C	17.9	C	21.6
		NB	A	9.8	A	9.6
		SB	A	0.0	A	9.6
Route 29 and The Arc (North Drive)	Unsignalized	WB	C	19.7	C	22.7
		NB	A	0.0	A	0.0
		SB	A	8.8	A	0.0
Route 29 and The Arc (South Drive)	Unsignalized	WB	C	23.6	D	28.1
		NB	A	0.0	A	9.2
		SB	A	9.2	A	9.7
Route 29 Business and Malmaison Road	Signalized	EB	C	22.3	B	13.3
		WB	B	18.7	B	18.6
		NB	B	12.4	B	16.2
		SB	B	13.0	B	13.5

* Please note that the levels of service are reported in accordance with the HCM designations.

The complete level of service analysis for the existing condition is included in Appendix C for reference.

All analysis was performed utilizing the methodologies as defined in the Highway Capacity Manual (HCM). The measurement used to define the performance of an intersection is determined by level of service (LOS) A through F. A LOS C or better will be considered an acceptable LOS for this area. See Appendix B for a more detailed explanation of the methodology and criteria used for the Level of Service analysis. As shown in the table above, the intersection at Route 29 and Woodcrest Drive/Spring Garden

Road currently does not meet an acceptable LOS, where the existing level of service westbound along Spring Garden Road is at LOS F in the AM peak hour, and LOS E in the PM peak hour.

Bicycle and Pedestrian Facilities

Currently Route 29 does not support bicycle or pedestrian traffic along the section analyzed within this report. This study will consider the accommodations of bicycles and pedestrians along this section of road to adhere to the Virginia Commonwealth Transportation Board's (CTB) policy.

In review of the *West Piedmont Regional Bicycle Plan*, revised September 2007, Route 29, in Pittsylvania County is indicated as a possible high cost bicycle route. Four (4) possible roadway sections are shown within this report and are included in Appendix D for reference. When developing the alternative improvements for this section of roadway, these different typical sections will be included in order to include bicycle facilities along Route 29.

Environmental Resources

This section describes the potential environmental resources within the proposed project area. Table II summarizes potential environmental issues and recommendations for addressing possible impacts to those resources. Other environmental resources may exist within the proposed project area that are not included in the table.

Table II
Environmental Issues

Resource/Issue	**Database Searched**	**Comments**
Federal and State Threatened and Endangered Species	US Fish and Wildlife Service (USFWS)	A review of the USFWS, Environmental Conservation Online System revealed three species that are Federal Threatened (FT) and Federal Endangered (FE) in Pittsylvania County. The following species are known to or are believed to occur in Pittsylvania County: Small whorled pogonia (*Isotria medeoloides*) (FT), James spinymussel (*Pleurobema collina*) (FE), and Roanoke logperch (*Percina rex*) (FE).
	Virginia Department of Game and Inland Fisheries (VDGIF)	A review of the VDGIF database revealed six species that are State Threatened (ST), State Endangered (SE), Federal Threatened (FT), and/or Federal Endangered (FE) in Pittsylvania County. The following species are known or likely found in Pittsylvania County: Shrike, migrant loggerhead (*Lanius ludovicianus migrans*) (ST), Darter, Carolina (*Etheostoma collis*) (ST), Shrike, loggerhead (*Lanius ludovicianus*) (ST), Sandpiper, upland (*Bartramia longicauda*) (ST), Supercoil, spirit (*Paravitrea hera*) (SE), and Logperch, Roanoke (*Percina rex*) (SE).

Resource/Issue	Database Searched	Comments
	Department of Conservation and Recreation (DCR)	A review of the DCR Natural Heritage Resources (NHR) database revealed five species that are State Threatened (ST), State Endangered (SE), Federal Threatened (FT), and/or Federal Endangered (FE). The following species are known or likely found in Pittsylvania County: Orangefin Madtom (*Noturus gilberti*) (ST), Nestronia (*Nestronia umbellula*) (SE), Spirit Supercoil (Paravitrea hera) (SE), Small whorled pogonia (*Isotria medeoloides*) (FT, SE), and Roanoke logperch (*Percina rex*) (FE, SE).
Wildlife Refuges, Parks and 6(f) Lands (lands acquired with the Land and Water Conservation Funding)	National Park Service USFWS	According to the National Park Service, there are no parks, and 6(f) Lands within the project corridor. Based on information gathered from the USFWS, there are no wildlife refuges within the project corridor.
Types and Acreage of Wildlife Habitats		Habitats within the project corridor consist of fields (farmland), woods, and developed areas.
Wetland and Waters of the US (WOUS)	USFWS National Wetlands Inventory (NWI)	A review of the NWI online wetlands mapper noted no mapped wetlands within the project corridor. WOUS are present primarily within the southern portion of the project corridor. The absence of mapped wetlands does not mean they are not present on site; a potential cause of the absence could be that a survey was never conducted. A wetland/WOUS delineation should be conducted if a suspect area is identified. Additional review of USGS topographic maps and aerial photographs indicate at least one area north of the Blairs Fire Station could potentially contain jurisdictional waters/wetlands.
Geology and Groundwater Resources		According to the 1977 Geologic Map of the Blairs and Ringgold Quadrangles, Virginia, the geology of the project area consists of Precambrian, metamorphosed volcanic-sedimentary rocks. The Pittsylvania Co. Service Authority provides water in the Blairs area with a water main along Highway 29. The water is supplied by the City of Danville, Virginia and comes from the Dan River.
Soil Survey	United States Department of Agriculture (USDA), Natural Resources Conservation Service(NRCS)	Based on the NRCS web soil survey, there are 16 soil types within the project corridor. The three dominant soil types listed in descending abundance within the project corridor are: 1B (Appling sandy loam, 2 to 7 percent slopes), 1C (Appling sandy loam, 7 to 15 percent slopes), and 4B (Cecil sandy loam, 2 to 7 percent slopes). Soils within the project corridor are not hydric.

Resource/Issue	Database Searched	Comments
Prime Farmland, Agricultural and Forrestal Districts	USDA, Natural Resources Conservation Service (NRCS) Pittsylvania County, Virginia	Based on the NRCS web soil survey, the majority of the project corridor is classified as prime farmland or farmland of statewide importance. However, this soil designation does not determine if the soil is currently being used for agriculture. According to Pittsylvania County's GIS database, areas along the project corridor are not zoned for agricultural purposes – they are primarily for businesses and residential housing. The southeastern corner of the project corridor is zoned for agricultural use – approximately 95 acres.
Federal Emergency Management Agency (FEMA)	FEMA Map Service Center	There are no FEMA floodplains within the project corridor. Therefore, impacts to FEMA floodplains will not occur. Local and state floodplains will be minimally affected.
Historic and Cultural Resources	Virginia Department of Historic Resources (DHR), Virginia Cultural Resource Information System (V-CRIS) National Park Service	According to DHR's V-CRIS interactive map, there are four historic and cultural resources near the project corridor. 1) A historic farm, currently known as Shields Farm, located at the southeastern corner of the project corridor (surrounds Route 29 Business north interchange); DHR-ID is 071-0074. 2) A building currently known as the Blairs Feed and Hunting Supply; located on the southwestern corner of project corridor, west of Route 29 Business; DHR-ID is 071-0231. 3) A historic farm known as Pruitt (Pruit) Farm located south of the intersection of Routes 29 Business and 29 Bypass, and west of Route 29 Business; DHR-ID is 071-0230. 4) A building currently known as Gregory Farm; located east of the Danville Expressway and south of Malmaison Road; DHR-ID is 071-0105. According to the National Park Service's interactive map, there are no National Register of Historic Places within the project corridor.
Hazardous Material Spills, Releases, and/or Issues	State and Federal Databases via Environmental Data Resources (EDR) Virginia Department of Environmental Quality (DEQ) Environmental Protection Agency (EPA)	According to research compiled by Environmental Data Resources (EDR), there are no known hazardous material spills, releases, or issues within a one mile radius of the Blairs Fire Station located at 7100 US HWY 29, Blairs, VA 24527. A review of the EPA "EnviroMapper" did not reveal any known hazardous materials, spills, releases or issues within the project corridor. However, the Virginia DEQ website "What's in My Backyard" documented one petroleum release within the project corridor west of the intersection of Malmaison Rd and US HWY 29 south.

Resource/Issue	Database Searched	Comments
Water Quality Data and Watersheds	VDGIF EPA Virginia DEQ	The VDGIF website indicates that the project corridor is located within the Roanoke River Watershed. The US EPA's interactive map "How's My Waterway?", revealed that there are no streams within the project corridor but, there are streams adjacent to the project corridor. Sandy Creek, located south of Kendall Road, and east of Route 29N, is unpolluted. The remaining tributaries surrounding the project corridor are unnamed; data concerning stream pollution conditions for these unnamed tributaries are unavailable. There are no impaired streams near or within the project area based on the 2012 draft of the Virginia Water Quality Assessment 305(b)/303(d) Integrated Report found on the Virginia DEQ website.
Minority and Low-Income Populations	EPA	Based on the US EPA Environmental Justice's EJ View, the 2010 Summary File 1 (SF1) census showed the minority population near the intersection of Route 29 Business and Route 726 as 40-100%; near the intersection of Woodcrest Drive and Route 29, the minority population ranges between 30-100%; east of Route 29, the minority population ranges between 10-20%; west of Route 29 the minority population ranges between 0-10%. According to the US EPA Environmental Justice Database, the 2010 demographics conducted by the American Community Survey (ACS) division of the Census Bureau determined that 0-10% of people are living below poverty. The per capita income within and surrounding the project corridor is $16,000 - $26,000.

Resource/Issue	Database Searched	Comments
Socio-economic Data	EPA US Census Bureau	According to the 2007-2011 ACS 5-year estimates, 21.7% of the population in Blairs, Virginia who are 25 years or older have not received a high school diploma or have had less than 12 grades of schooling; 14.1% have received their Bachelor's degree; and 6.3% have received their graduate or professional degree According to the 2007-2011 ACS 5-year estimates, the median age was 48.8 years and the total population was 625. Of the 625 people living in Blairs, 48.5% were male and 51.5% were female. Based on the 2007-2011 data, there are 290 households in Blairs; 73.1% of the 290 households are family households. Family households are separated as follows: 48.3% are married-couple, family; 7.9% are male householders with no wife present, family, and 16.9% are female householders with no husband present, family. Nonfamily households contribute 26.9% to the overall 290 households. According to the 2007-2011 ACS 5-year estimates, 13.9% of individuals 16 years and older were unemployed. Based on the 2006-2010 ACS 5-year estimates, the two primary income and benefits range brackets for households in Blairs are $25,000 to $34,999/year and $35,000 to $49,999/year; 10.7% of households have income and benefits less than $10,000/year. The median household income is $41,645/year.
Local and Regional Public Health and Safety		Local fire departments include the Blairs Fire Department, Dry Fork Fire Department, and Danville Fire Department. County rescue squads include the Danville Life Saving Crew, Tunstall Fire & Rescue, Chatham Rescue, and Gretna Rescue. County law enforcement agencies include the Chatham Town Police, Danville Police Department, Gretna Town Police, and Pittsylvania County Sheriff's Office. The local hospital is the Danville Regional Medical Center.

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BLAIRS (RTE. 29) EXISTING ENVIRONMENTAL CONCERNS LOCATIONS

PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
5

Traffic Safety/Crash Data Analysis

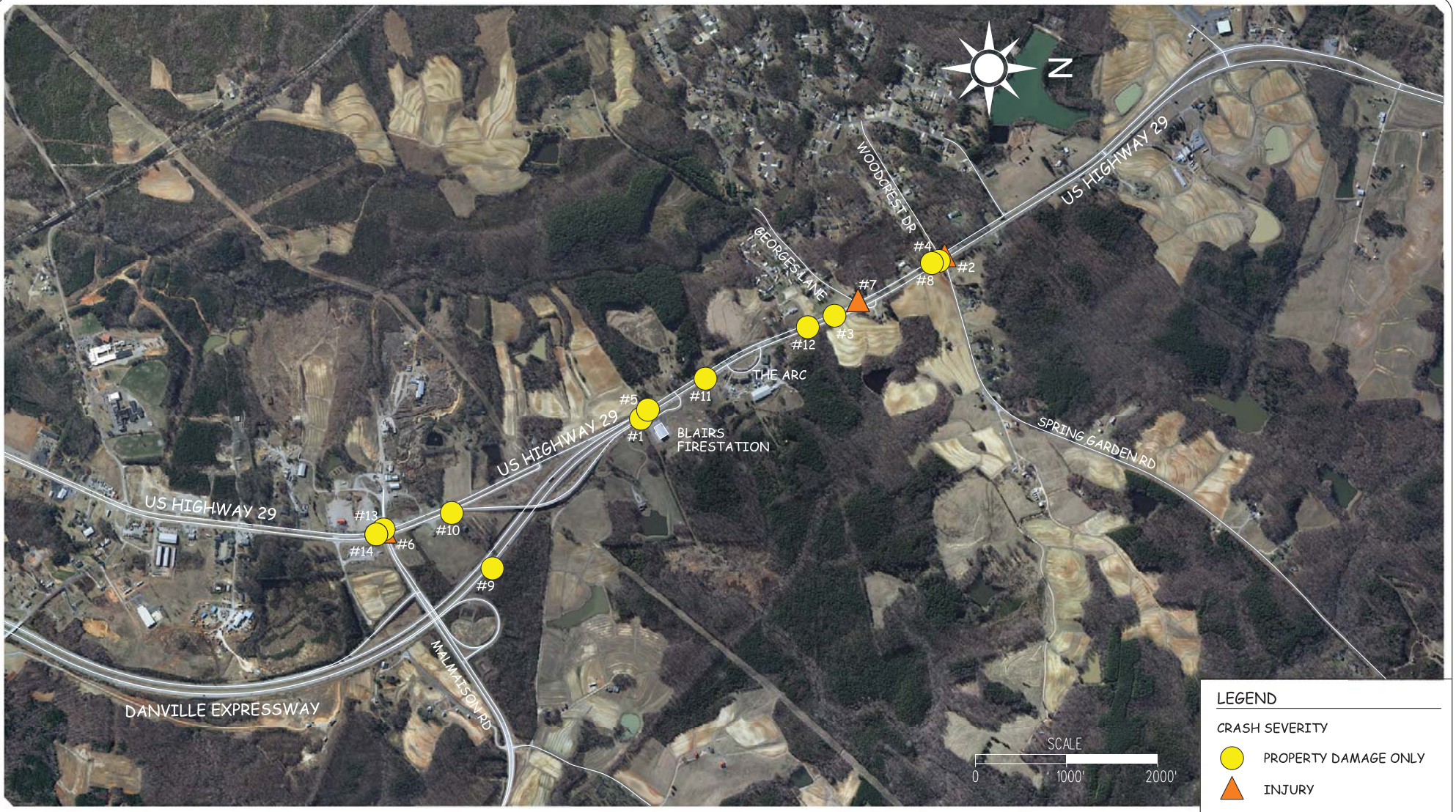
Crash data from the most recent three year period (2010 to 2012) for the corridor was provided by VDOT. A full review of the crash data can be found in Appendix E. As part of the safety analysis to supplement crash data analysis for Route 29, segments and intersections were analyzed based on the classification of the roadway. The crash rates for the segments are listed below:

1. Route 29-N Ramp 16A to Spring Garden Road: 36.93 per 100M vehicle miles traveled
2. Malmaison Road to Danville Expressway/Route 29-N: 83.17 per 100M vehicle miles traveled

The crash rates per the listed segments along Route 29 can be compared to Statewide Average crash rates. Segment one, classified as a Rural Other Principal Arterial, has a crash rate of 36.93 per 100M vehicle miles traveled. This is less than half of the Statewide Average crash rate for Rural Other Principal Arterials, at 78.23 per 100M vehicle miles traveled. The crash rate of 83.17 per 100M vehicle miles traveled for segment two can be compared to the Statewide Average of 120.25 per 100M vehicle miles traveled for a Rural Minor Arterial. Again, the average crash rate per segment two is less than three-quarters of the Statewide Average. While minimizing the crash rates is a concern, it is not the driving factor for the further development of the proposed alternatives due to the relatively low crash rates for each segment.

Intersections were examined based on factors such as the method of traffic control, lane geometry, and the number of approaches. According to the crash summary data sheet, 7 of the 14 total reported accidents were at existing intersections. Of those 7 accidents, 3 occurred at the intersection of Route 29 and Spring Garden Road, and 3 occurred at the intersection of Route 29 Business and Malmaison Road. The intersection at Route 29 and Spring Garden Road is currently stop-controlled on the minor approaches to Route 29, and the intersection at Route 29 and Malmaison Road is signalized.

The locations of each accident in the study area are shown in Figure 6. Figure 7 below illustrates that there were 9 total crashes on Route 29, and 5 total crashes on Route 29 Business in the years of 2010 through 2012. The greatest type of crash along Route 29 was angle, closely followed by collisions with deer.



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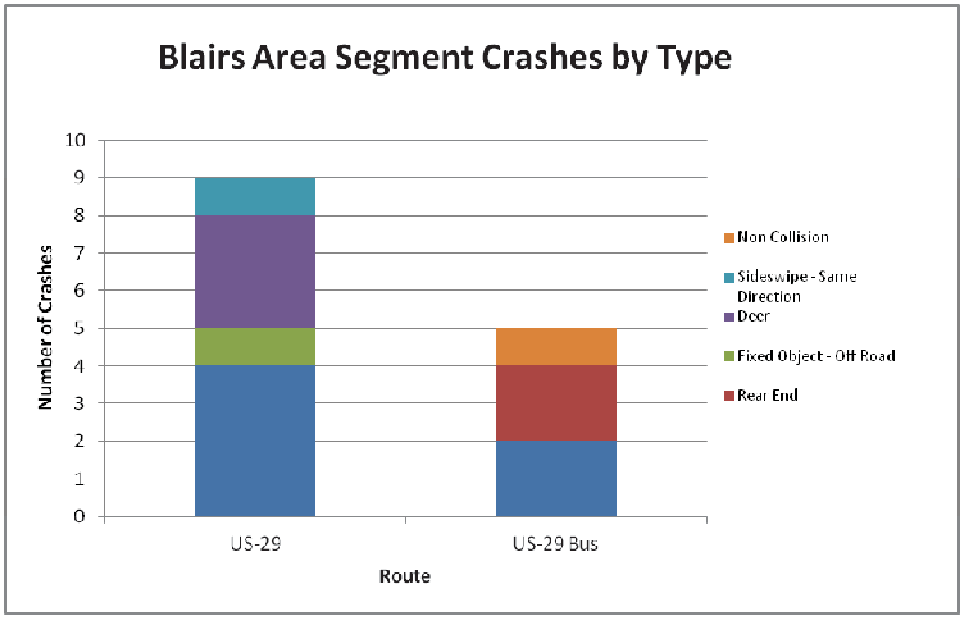
BLAIRS (RTE. 29) EXISTING CRASH LOCATIONS AND SEVERITY

PITTSYLVANIA COUNTY, VIRGINIA

FIGURE 6

Figure 7
Route 29 Segment Crash by Type

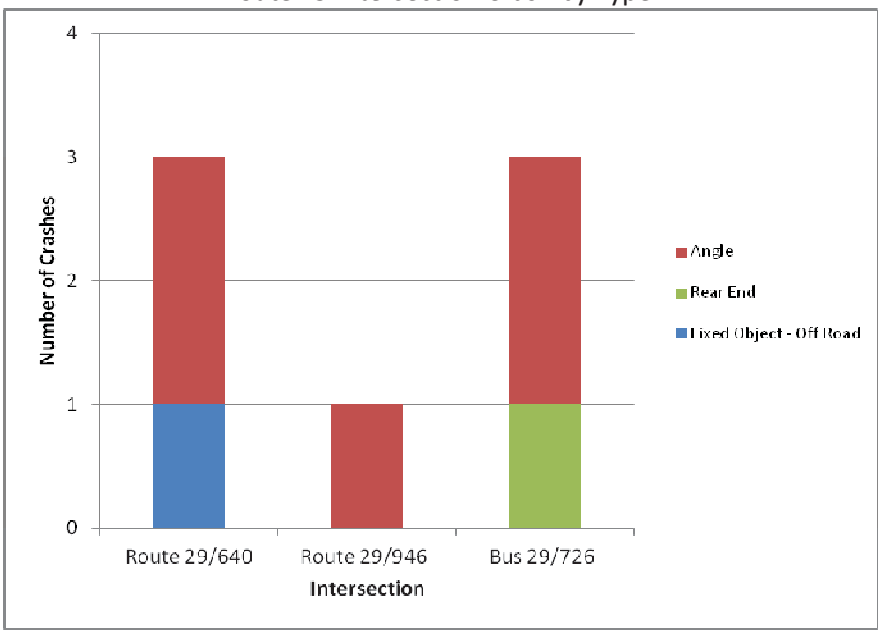


In addition, within the study limits along Route 29, crashes at the three intersections listed below were analyzed to help better understand potential improvements.

1. Intersection of Route 29 and Woodcrest Drive/Spring Garden Road;
2. Intersection of Route 29 and Georges Lane; and
3. Intersection of Route 29 Business and Malmaison Road.

The types of crashes that occurred between 2010 and 2012 can be seen in Figure 8. As shown, a majority of the crashes were Angle crashes, including both injury and property damage only cases. Probable causes for the high number of Angle crashes could be attributed to various factors such as large intersection volumes, restricted sight distance, and excessive speed on approaches. Potential solutions to these factors to examine are installation of signalized intersections, appropriate warning signage, and/or the consideration of paved shoulders/roadway widening.

Figure 8
Route 29 Intersection Crash by Type



III. FUTURE NO-BUILD ALTERNATIVE (YEAR 2035)

Utilizing information obtained from the regional traffic model received from VDOT for this area, Ramey Kemp and Associates, Inc. projected the future no-build traffic volumes. Through this model the following annual growth rates were approximated for the associated movements at the following intersections based on 2006 and 2035 ADT data.

Intersection of Route 29 and Woodcrest Drive/Spring Garden Road
Southbound left, northbound right, and eastbound through as well as all westbound movements: 3.5%
All remaining movements on Route 29 and Woodcrest Drive/Spring Garden Road: 2.5%

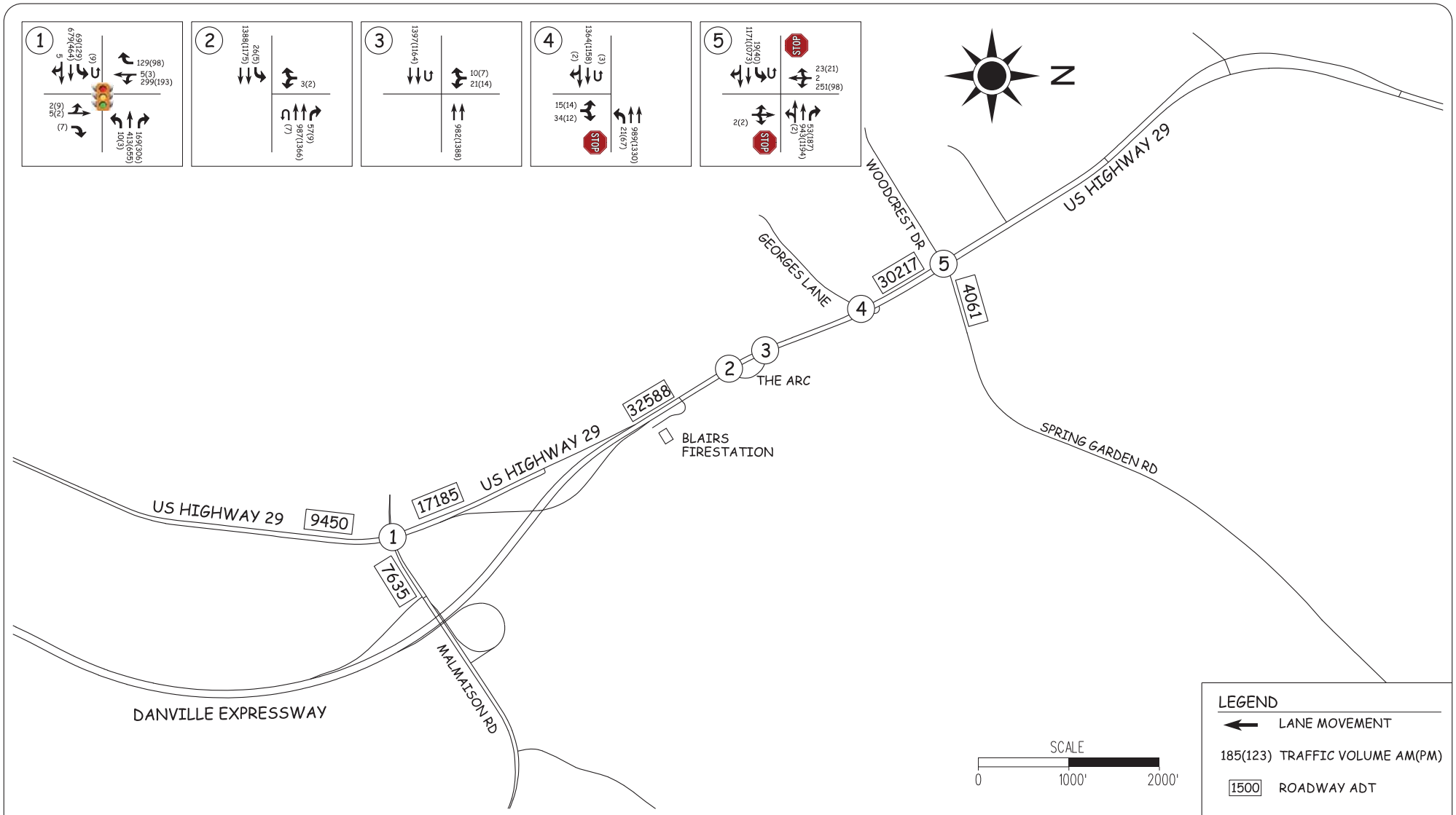
Intersection of Route 29 and Georges Lane
All movements on Route 29 and Georges Lane: 2.5%

Intersection of Route 29 and The Arc (North Drive)
All movements on Route 29 and The Arc (North Drive): 2.5%

Intersection of Route 29 and The Arc (South Drive)
All movements on Route 29 and The Arc (South Drive): 2.5%

Intersection of Route 29 Business and Malmaison Road
All movements on Route 29 Business and Malmaison Road: 2.5%

From this software, the future no-build traffic volumes were determined as shown in Figure 9. Utilizing these traffic volumes, the future no-build intersection level of service analysis was completed.



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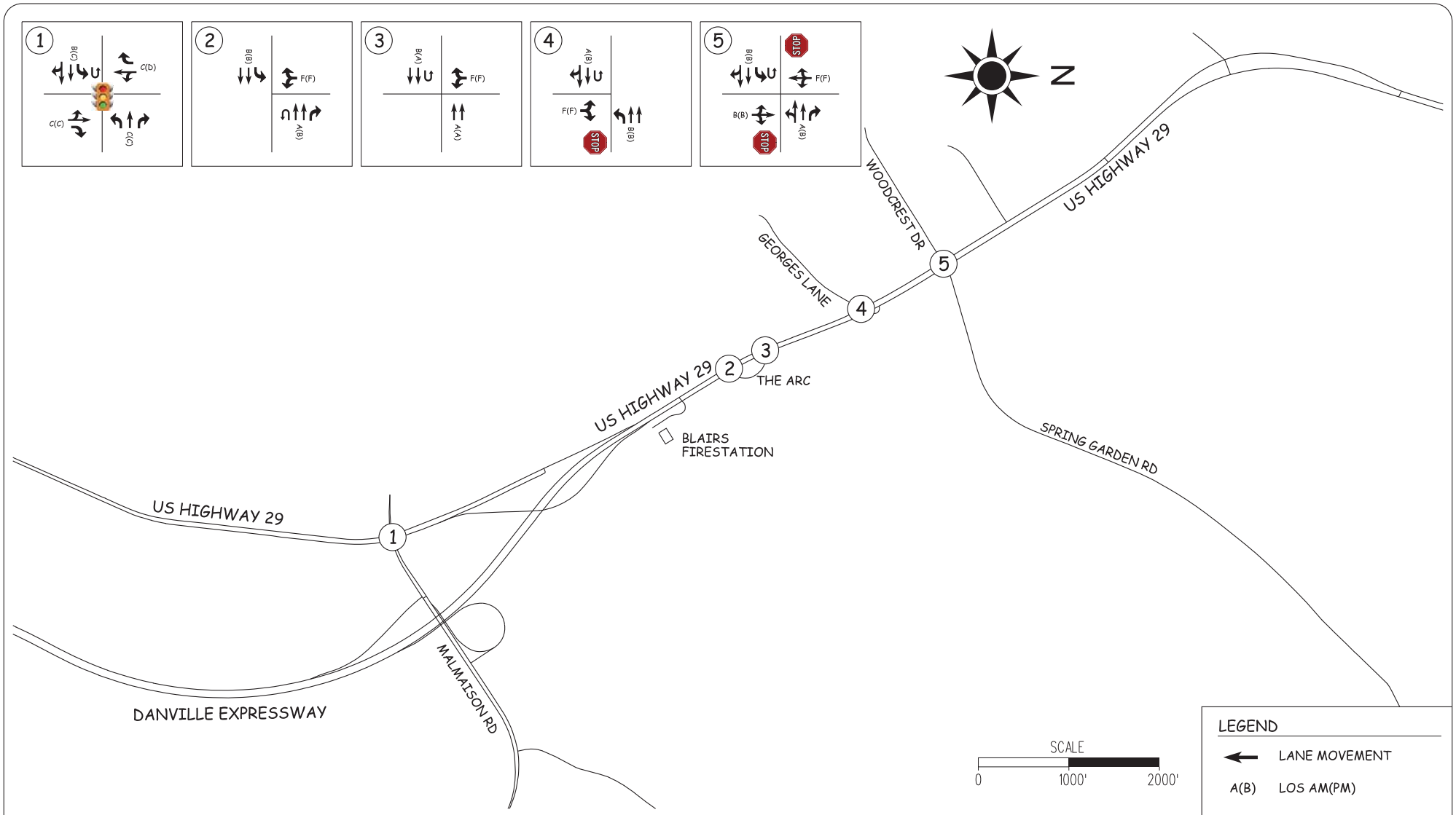
TRANSPORTATION ENGINEERS

BLAIRS (RTE. 29) FUTURE NO BUILD (YEAR 2035) TRAFFIC VOLUMES
PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
9



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TRANSPORTATION ENGINEERS

BLAIRS (RTE. 29) FUTURE NO BUILD (YEAR 2035) LEVELS OF SERVICE
PITTSYLVANIA COUNTY, VIRGINIA

FIGURE
10

As shown in Figure 10 on the previous page, the levels of service for some approaches will deteriorate to unacceptable levels (LOS D and below) at several intersections. The levels of service for the no-build alternative are also shown in Table III below.

Table III
Year 2035 – Future No-Build Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and Woodcrest Drive/Spring Garden Road	Unsignalized	EB	B	14.0	B	12.9
		WB	F	2506.1	F	1414.4
		NB	A	0.0	B	11.0
		SB	B	10.9	B	13.3
Route 29 and Georges Lane	Unsignalized	EB	F	82.6	F	125.0
		NB	B	14.0	B	13.3
		SB	A	0.0	B	13.0
Route 29 and The Arc (North Drive)	Unsignalized	WB	F	78.5	F	103.3
		NB	A	0.0	A	0.0
		SB	B	10.7	A	0.0
Route 29 and The Arc (South Drive)	Unsignalized	WB	F	74.7	F	108.5
		NB	A	0.0	B	11.9
		SB	B	11.7	B	13.3
Route 29 Business and Malmaison Road	Signalized	EB	C	33.0	C	22.0
		WB	C	27.9	D	52.9
		NB	C	23.5	C	31.3
		SB	B	17.5	C	25.4

* Please note that the levels of service are reported in accordance with the HCM designations.

The complete level of service analysis for the future no build condition is included in Appendix C for reference.

The most severe deterioration is forecast to occur at the intersection of Route 29 and Georges Lane, as well as The Arc along Route 29. Poor service levels are due to the increase in forecasted traffic volumes along Route 29 reducing the frequency of adequate gaps in the traffic stream causing increased delay of the motorists on the minor street approaches before safely entering the traffic stream. As shown by this analysis, improvements to these intersections are required if acceptable levels of service are to be reached in the year 2035.

IV. STATEMENT OF PURPOSE AND NEED

Considering VDOT Access Management Standards and the results of the analysis of the existing and future no-build (Year 2035) conditions, the statement of purpose and need for the Blairs Fire Station and Route 29 Evaluation of Improvements Study is based upon addressing the following issues:

1. Levels of Service at intersections, within the study limits, are anticipated to reduce below acceptable levels unless improvements are made based on signal warrants and intersection analysis;
2. Safety and mobility shall be preserved or increased through implementation of identified spot improvements; and,
3. Accommodations for bicycles and pedestrians should be considered along Route 29 Road to adhere to the Commonwealth Transportation Board's (CTB) Policy.

The improvement alternatives will be developed to best satisfy the requirements in each of the three guidelines listed above.

V. IMPROVEMENT ALTERNATIVES

Improvement alternatives to this section of Route 29 will be analyzed within this study. In order to determine which alternative best meets the needs of this section of roadway, evaluation criteria were developed. Eight items were chosen as part of the criteria along with their respective weight. These items are shown in Table IV below.

Table IV
Evaluation Criteria

Criteria #	Criteria Description	Criteria Weight (5-1)
1	Traffic Levels of Service - Capacity	5
2	System Performance	5
3	Safety	5
4	Emergency Response Time	5
5	Cost	5
6	Environmental Impacts	4
7	Right-of-way Impacts	3
8	Consistency with Local / Land Use Plans	2

Based on the findings of the future no-build capacity analysis, most approaches to the intersections will fail to meet adequate capacity requirements or operate at acceptable levels of service. Based on the capacity analysis, it was determined that improvements are needed at the intersections of Woodcrest Drive/Spring Garden Road, Georges Lane, and The Arc on Route 29. A review of the crash data was also completed and very few accidents occurred along the project limits of the Route 29 segment and specified intersections.

The improvements are broken up into three alternatives, each focused specifically on improvements to the intersection of Route 29 and The Arc (North) and providing improved access to the existing fire station. There are several improvements held constant throughout each of the alternatives in order to better system performance and safety. These improvements are located at the intersections of Route 29 and Woodcrest Drive/Spring Garden Road, Route 29 and Georges Lane, Route 29 and The Arc (South), and Route 29 and the existing Blairs Fire Station access road. At the intersection of Route 29 and Woodcrest Drive/Spring Garden Road, the southbound left turn lane will be extended to provide a 200' storage length and taper. In addition, Woodcrest Drive will be widened to two lanes and connected to Oak Lane. Further, there will be a northbound left turn lane installed and the northbound right turn lane will be extended to provide a 200' storage length and taper. At the intersection of Route 29 and Georges Lane, the existing left turn lane and crossover will be closed. At the intersection of Route 29 and The Arc (South), the existing left turn lanes and crossover will be closed to restrict access to the north end of The Arc. Finally, the existing crossover and entrance to the Blairs Fire Station will be closed, and alternative access will be provided. Through the implementation of these improvements, the safety and capacity along this stretch of road should be improved.

Alternative 1 – Right In/Right Out

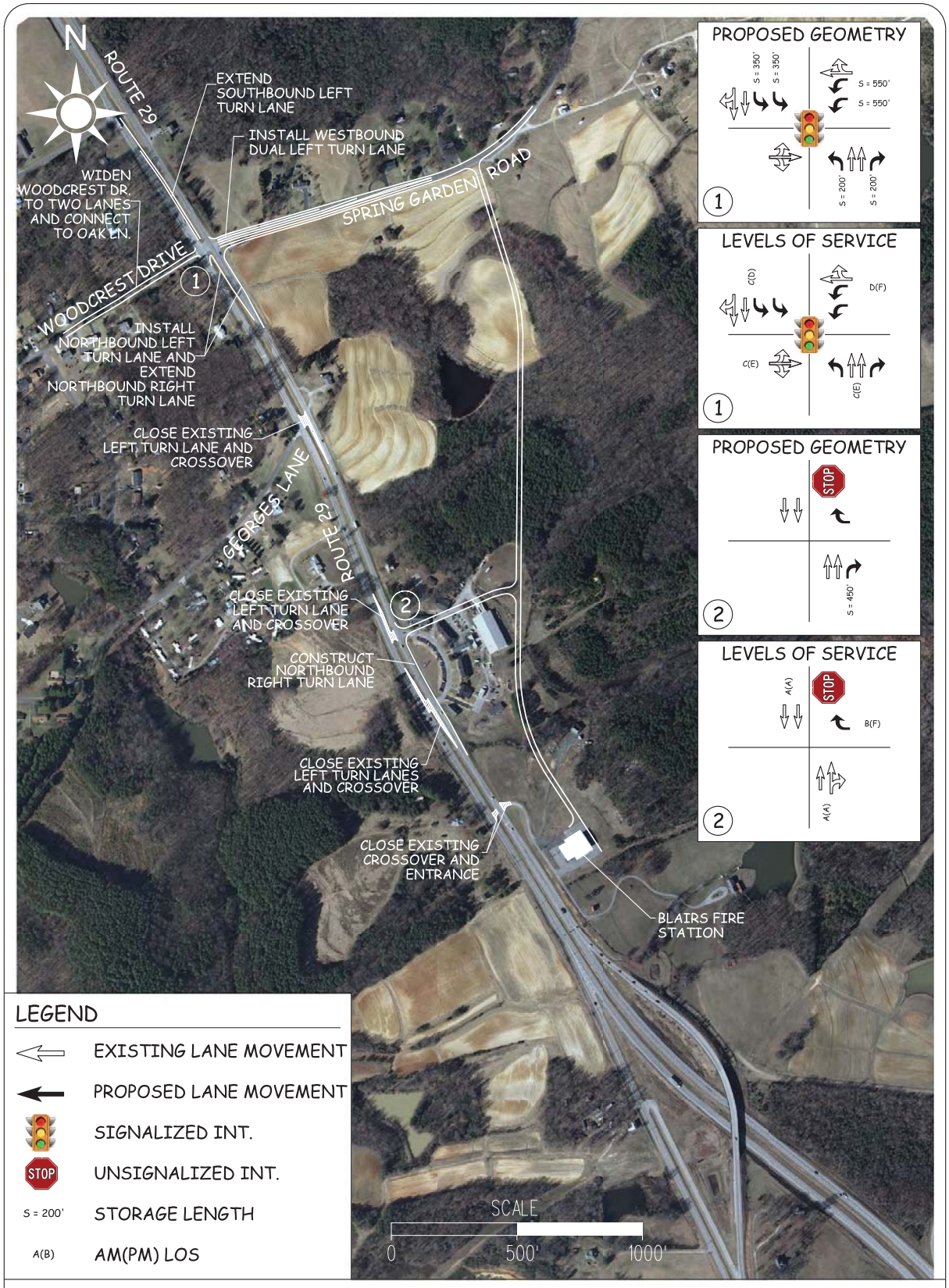
Alternative 1 consists of the closing of the southbound left turn lane and crossover on Route 29 into The Arc (North) in order to limit access to the intersection to right in/right out only. A northbound right turn lane will be added to help mitigate potential congestion on northbound Route 29. The access at the intersection of Route 29 and The Arc connects to a proposed frontage road, which provides access to the Blairs Fire Station and Spring Garden Road. Additionally, dual left turn lanes will be installed for the westbound approach at the intersection of Route 29 and Spring Garden Road to help minimize capacity issues resulting from the frontage road. A traffic signal will also be installed at this intersection to improve performance. These improvements are shown in Figure 11. The following tables, which display intersection levels of service and delay in the AM and PM peak hours, can also be found in Appendix F along with tables for the remaining intersections within the study area.

Table V
Year 2035 – Route 29 and The Arc (North) Alternative 1 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and The Arc (North)	Unsignalized	WB	B	13.5	F	67.3
		NB	A	0.0	A	0.0
		SB	A	0.0	A	0.0

* Please note that the levels of service are reported in accordance with the HCM designations.

The restricted access at the intersection of Route 29 and The Arc (North) to right in/right out and the addition of a northbound right turn lane will reduce delays and improve operation at all approaches, except for the westbound approach during the PM peak hour. This approach will operate at LOS F in the PM peak hour, which is unsatisfactory. The delay and poor level of service in this approach could cause potential issues with backup to the proposed frontage road, which proposes concerns with safety.



ROUTE 29 AND BLAIRS FIRE STATION ACCESS ALTERNATIVE 1 IMPROVEMENTS PITTSYLVANIA COUNTY, VIRGINIA

Dewberry

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

FIGURE
11

Table VI
Year 2035 – Route 29 and Woodcrest Drive/Spring Garden Road Alternative 1 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and Woodcrest Drive/Spring Garden Road	Signalized	EB	C	32.7	E	65.4
		WB	D	40.2	F	93.2
		NB	C	26.8	E	58.3
		SB	C	22.5	D	53.5

* Please note that the levels of service are reported in accordance with the HCM designations.

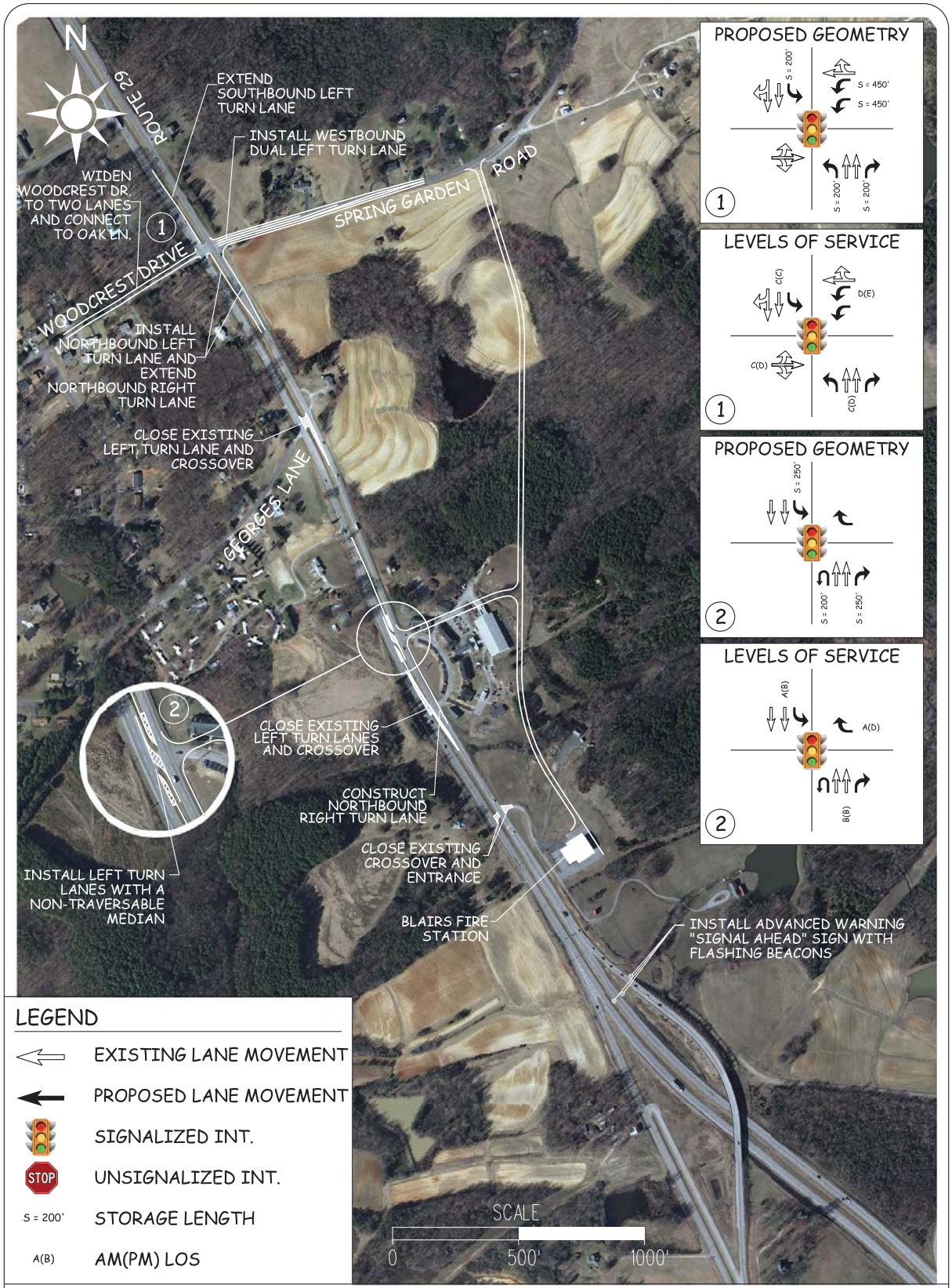
The installation of dual left turn lanes on the westbound approach at the intersection of Route 29 and Spring Garden Road, as well as the installation of a traffic signal, will not provide adequate levels of service on any approach during the PM peak hour. All of the approaches during the AM peak hour, except for the westbound approach, operate at an adequate LOS. The lower levels of service and longer delays at this intersection are due to diverting traffic intended for southbound Route 29 to the proposed frontage road, which connects to Spring Garden Road. As can be seen in Table VI, the addition of a traffic signal will increase the delay along the major route, Route 29, but significantly reduce the delay for the westbound approach. However, the westbound approach will continue to operate at LOS F, which is unsatisfactory.

A preliminary analysis of Warrant 3 (Peak Hour) traffic signal warrant analysis shows that the intersection at Route 29 and Woodcrest Drive/Spring Garden Road meets the volume thresholds without any future development added to the intersection.

The preliminary estimate of probable cost for the improvements involved with this alternative indicates that the improvements could cost approximately $5,384,388 to design and construct. Cost estimate was prepared using VDOT Transportation & Mobility Planning Division's statewide planning level cost estimates. A more detailed breakdown of the cost is included in Appendix G.

Alternative 2 – Leftovers

Alternative 2 consists of installing left turn lanes with a non-traversable median at the intersection of Route 29 and The Arc (North). Additionally, a northbound right turn lane will be constructed at the intersection to help increase capacity and minimize delay. This intersection will be controlled by a traffic signal to further improve capacity and reduce delay. A signal ahead warning sign with flashing beacons will be installed on the northbound Route 29 and the flyover from Business 29 approaches to notify drivers of the stop condition at the signal as well as impending emergency fire trucks entering the intersection at The Arc (North). The improvements at this intersection will connect to a proposed frontage road, which will provide access to the Blairs Fire Station and will connect to Spring Garden Road. Due to the improvements at this intersection and the addition of a frontage road connecting to Spring Garden Road, dual left turn lanes on the westbound approach at the intersection of Route 29 and Spring Garden Road will be installed. These improvements are shown in Figure 12. The following tables, which display intersection levels of service and delay in the AM and PM peak hours, can also be found in Appendix F along with tables for the remaining intersections within the study area.



ROUTE 29 AND BLAIRS FIRE STATION ACCESS ALTERNATIVE 2 IMPROVEMENTS PITTSYLVANIA COUNTY, VIRGINIA

Dewberry

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

FIGURE
12

Table VII
Year 2035 – Route 29 and The Arc (North) Alternative 2 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and The Arc (North)	Signalized	WB	A	0.4	D	35.2
		NB	B	11.2	B	19.7
		SB	A	6.3	B	14.8

* Please note that the levels of service are reported in accordance with the HCM designations.

The implementation of leftovers and the addition of a northbound right turn lane at the intersection of Route 29 and The Arc (North) will significantly help reduce delays and improve operation in the westbound approach. This approach improves from LOS F and a delay of 67.3 sec/veh to LOS D and a delay of 35.2 sec/veh in the PM peak hour for the year 2035. The intersection, with the exception of the westbound approach in the PM peak hour, will operate at a satisfactory level thereby improving system performance.

Table VIII
Year 2035 – Route 29 and Woodcrest Drive/Spring Garden Road Alternative 2 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and Woodcrest Drive/Spring Garden Road	Signalized	EB	C	32.9	D	52.3
		WB	D	44.1	E	61.5
		NB	C	21.1	D	39.5
		SB	C	20.4	C	33.7

* Please note that the levels of service are reported in accordance with the HCM designations.

The installation of dual left turn lanes on the westbound approach at the intersection of Route 29 and Spring Garden Road, as well as the installation of a traffic signal, will not provide adequate levels of service on any approach during the PM peak hour. All of the approaches during the AM peak hour, except for the westbound approach, operate at an adequate LOS. The lower levels of service and longer delays at this intersection are due to diverting traffic intended for southbound Route 29 to the proposed frontage road, which connects to Spring Garden Road. The improvements at this intersection will negatively impact system performance.

A preliminary analysis of Warrant 3 (Peak Hour) traffic signal warrant analysis shows that the intersection at Route 29 and Woodcrest Drive/Spring Garden Road meets the volume thresholds without any future development added to the intersection. Specifically, under Alternative 2, the left-over access is expected to meet the minimal volume thresholds under Warrant 3 with 72,250 square feet of retail development.

The preliminary estimate of probable cost indicates that these improvements could cost approximately $6,045,475 to design and construct. Cost estimate was prepared using VDOT Transportation & Mobility Planning Division's statewide planning level cost estimates. A more detailed breakdown of the cost is included in Appendix G.

Alternative 3 – Full Access

Alternative 3 consists of a full access signalized intersection at Route 29 and The Arc (North). The southbound left turn lane will be extended. There will be an additional southbound left turn lane in order to improve capacity and delay on southbound Route 29. In addition, northbound left and right turn lanes will be constructed to mitigate traffic on northbound Route 29. For the westbound approach on The Arc (North), a right turn and dual left turn lanes will be constructed. A signal ahead warning sign with flashing beacons will be installed on the northbound Route 29 and the flyover from Business 29 approaches to notify drivers of the stop condition at the signal as well as impending emergency fire trucks entering the intersection at The Arc (North). The improvements at this intersection will connect to a proposed frontage road, which will provide access to the Blairs Fire Station and will connect to Spring Garden Road. Further, a westbound left turn lane will be installed at the intersection of Route 29 and Spring Garden Road. These improvements are shown in Figure 13. The following tables, which display intersection levels of service and delay in the AM and PM peak hours, can also be found in Appendix F along with tables for the remaining intersections within the study area.

Table IX
Year 2035 – Route 29 and The Arc (North) Alternative 3 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and The Arc (North)	Signalized	WB	D	38.7	D	40.6
		NB	A	8.5	C	22.2
		SB	A	5.6	B	17.9

* Please note that the levels of service are reported in accordance with the HCM designations.

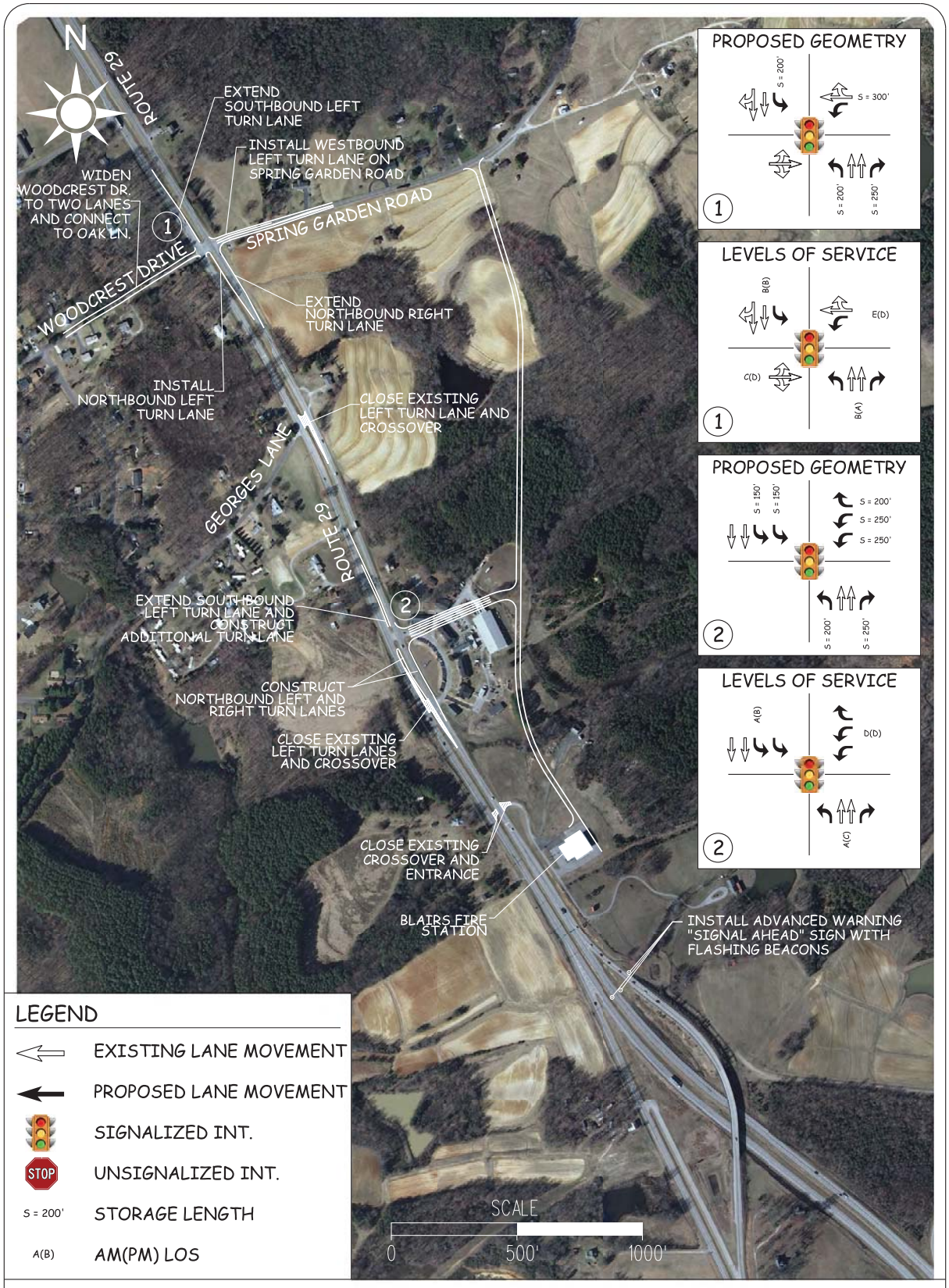
Implementing a full access, signalized intersection at Route 29 and The Arc (North) will slightly reduce delays and improve operation in the westbound approach, but increase the delay and levels of service on the other approaches. The changes will slightly decrease intersection performance and ease of current travel on Route 29.

Table X
Year 2035 – Route 29 and Woodcrest Drive/Spring Garden Road Alternative 3 Intersection LOS

			AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Route 29 and Woodcrest Drive/Spring Garden Road	Signalized	EB	C	29.6	D	37.5
		WB	E	60.9	D	37.8
		NB	B	11.7	A	4.4
		SB	B	18.5	B	13.2

* Please note that the levels of service are reported in accordance with the HCM designations.

The installation of a left turn lane in the westbound approach at the intersection of Route 29 and Spring Garden Road, as well as the installation of a traffic signal, will improve delay and levels of service on the westbound approach during both the AM and PM peak hour. The addition of a full access, signalized intersection at Route 29 and The Arc (North), along with the implementation of a frontage road, significantly improves the performance of this intersection at Route 29 and Woodcrest Drive/Spring Garden Road. This allows for the overall improvement in system performance.



ROUTE 29 AND BLAIRS FIRE STATION ACCESS ALTERNATIVE 3 IMPROVEMENTS PITTSYLVANIA COUNTY, VIRGINIA

Dewberry

RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS

FIGURE 13

A preliminary analysis of Warrant 3 (Peak Hour) traffic signal warrant analysis shows that the intersection at Route 29 and Woodcrest Drive/Spring Garden Road meets the volume thresholds without any future development added to the intersection. Specifically, under Alternative 3, the full access is expected to meet the minimal volume thresholds under Warrant 3 with 27,600 square feet of retail development.

The preliminary estimate of probable cost indicates that these improvements could cost approximately $6,439,038 to design and construct. Cost estimate was prepared using VDOT Transportation & Mobility Planning Division's statewide planning level cost estimates. A more detailed breakdown of the cost is included in Appendix G.

VI. SUMMARY AND RECOMMENDATIONS

Three alternatives have been identified and evaluated per improvement in safety and capacity issues associated with Route 29 and the Blairs Fire Station. The alternatives showcase a different intersection layout at Route 29 and The Arc (North), each providing a frontage road with connection to the Blairs Fire Station and Spring Garden Road. As revealed in the previous section, the alternatives vary in both cost and benefit to the roadway and specified intersections. The following describes the pros and cons associated with each alternative in accordance with their importance shown in the evaluation criteria above.

The first alternative, which features a right in/right out access at the intersection of Route 29 and The Arc (North), may slightly improve safety at the intersection, but will negatively affect the capacity. This alternative, with its restricted right in/right out access, potentially reduces the accident rate by closing the southbound left turn lane and crossover, therefore improving safety. Alternatively, the restricted access fails to provide adequate levels of service in the westbound approach and increases delay at the intersection, which worsens intersection and segment performance. Further, because of the restricted southbound access from Route 29 to the Blairs Fire Station, emergency response time will be negatively impacted. Finally, a signalized intersection is necessary at the intersection of Route 29 and Woodcrest Drive/Spring Garden Road in order to accommodate the future growth and expected capacity. The addition of a frontage road connecting to Spring Garden Road further proves the necessity of the installation of a traffic signal at this intersection. The installation of a signalized intersection increases the cost for this alternative.

The second alternative, which features the installation of left turn lanes with a non-traversable median at the intersection of Route 29 and The Arc (North), will slightly improve intersection handling capacity and safety, but worsens intersection and segment performance. This alternative provides access to and from the Blairs Fire Station, with outlet at both the intersection of Route 29 and The Arc (North) and Spring Garden Road. The issue with this access is that it limits access from the Blairs Fire Station at The Arc (North) from taking southbound Route 29, which potentially increases emergency response time. Since emergency response time is a significant factor in the evaluation of the alternatives, this alternative could include the installation of a median in which emergency response vehicles can still make left turns from The Arc entrance but prohibit normal traffic from making the turn, in place of a non-traversable median. The signalized intersection(s) increase the traffic handling capacity and improve the safety of both vehicular and pedestrian traffic, but in turn accrue a high cost with the installation of two signalized intersections. Further, even with the addition of both signalized intersections, this alternative still fails to provide adequate levels of service and increases delay at intersections, which decreases intersection and segment performance.

The third alternative, which features a full access intersection at Route 29 and The Arc (North), improves the capacity, safety, and overall system performance. This alternative allows for simple and easy access to and from the Blairs Fire Station, with outlet both at Route 29 at The Arc (North) and Spring Garden Road. Making the intersections of Route 29 at The Arc (North) and Route 29 at Woodcrest Drive/Spring Garden Road full access intersections minimizes the overall delay and levels of service, therefore greatly improving system performance. Because these intersections also implement signalization in addition to full access, the traffic handling capacity increases and the safety of both vehicular and pedestrian traffic improves. The negative of this alternative is the cost associated with constructing two signalized, full access intersections.

With each of the three alternatives, an option was reviewed to extend the proposed frontage road south to connect to Hunters Lane. The option was discussed with the WPPDC, MPO, and VDOT. Following those discussions it was determined that to fully evaluate and understand the impacts of this connection, the limits of the study would need to be increased and further study of the surrounding area near Hunters Lane would be necessary.

The improvement alternatives were scored and analyzed using the evaluation criteria shown previously in Table IV. The evaluation criteria was weighted with a score of 5-1, with 5 being the most significant factor in considering the improvements, and 1 being the least significant. Each alternative was scored per its associated improvements and given a total score. Alternative three had the highest score of 25, while alternative one had the lowest score of 16. These scores, along with the detailed score per criteria, can be found in Appendix H.

In addition to the proposed alternative improvements discussed, short term access to the Blairs Fire Station is necessary in the interim until the full extent of improvements is constructed. This interim improvement, as shown in Figure 14, would provide access through a frontage road, connecting the Blairs Fire Station to The Arc (North). The temporary improvement would also include the closing of the existing access at The Arc (South) and entrance to the fire station. An emergency signal at the intersection of Route 29 and The Arc (North) will be installed to allow unimpeded access for emergency vehicles. Along with the emergency signal, a signal ahead warning sign with flashing beacons will be installed on the northbound Route 29 and the flyover from Business 29 approaches to notify drivers of impending emergency fire trucks entering the intersection at The Arc (North). The preliminary estimate of probable cost associated with this short term improvement is $1,592,260.80 and a detailed breakdown of the cost estimate is shown in Appendix G.

Even with the implementation of these improvements, concerns from public perception remain over the emergency response time of emergency fire trucks due to limited access of the existing Blairs Fire Station. If land and funds are available, another possible alternative may involve relocating the fire station to a location suitable for a more efficient access that would significantly reduce the existing emergency response time. A rough cost associated with this relocation is included with cost estimates in Appendix G. As with any land acquisition the location and size could greatly vary the estimate. This estimate was based on the assumption that the fire station would be relocated adjacent to Route 29.

All three alternatives provide varying advantages and disadvantages in relation to improving the safety and capacity issues associated with Route 29 and the Blairs Fire Station.

ROUTE 29 AND BLAIRS FIRE STATION ACCESS SHORT TERM IMPROVEMENTS PITTSYLVANIA COUNTY, VIRGINIA

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RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

FIGURE
14

APPENDIX A

MANUAL TRAFFIC COUNTS

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- Woodcrest Dr/Spring Garden Rd

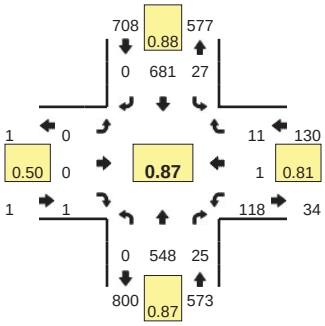
CITY/STATE: Blairs, VA

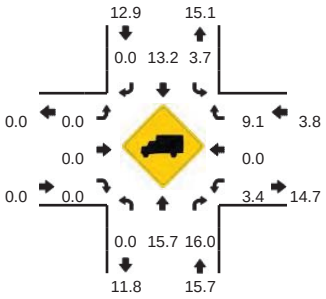
QC JOB #: 11206107

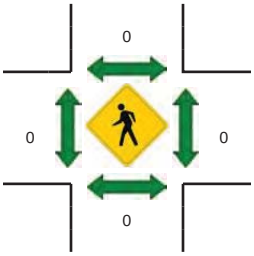
DATE: Tue, Sep 17 2013

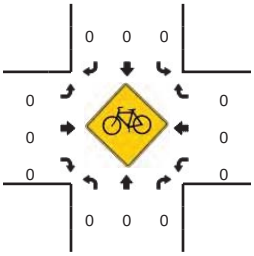
Peak-Hour: 7:15 AM -- 8:15 AM

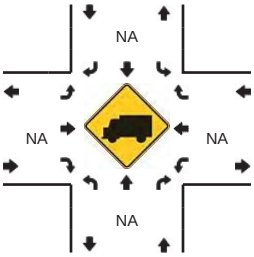
Peak 15-Min: 7:30 AM -- 7:45 AM

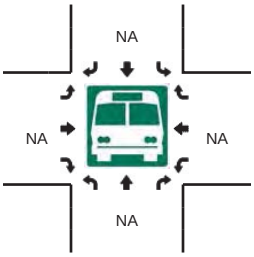












15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				Woodcrest Dr/Spring Garden Rd (Eastbound)				Woodcrest Dr/Spring Garden Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	87	9	0	1	115	0	1	0	0	0	0	16	0	3	0	232	
7:15 AM	0	120	11	0	3	164	0	2	0	0	0	0	30	0	2	0	332	
7:30 AM	0	160	4	0	3	198	0	3	0	0	0	0	37	1	2	0	408	
7:45 AM	0	155	5	0	0	180	0	7	0	0	1	0	25	0	3	0	376	1348
8:00 AM	0	113	5	0	3	139	0	6	0	0	0	0	26	0	4	0	296	1412
8:15 AM	0	122	8	0	3	174	0	1	0	0	1	0	14	0	1	0	324	1404
8:30 AM	0	80	7	0	3	159	0	0	0	0	0	0	20	0	3	0	272	1268
8:45 AM	0	104	9	1	0	141	0	2	0	0	0	0	18	0	0	0	275	1167

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	640	16	0	12	792	0	12	0	0	0	0	148	4	8	0	1632
Heavy Trucks	0	80	8		0	96	0		0	0	0		0	0	0		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

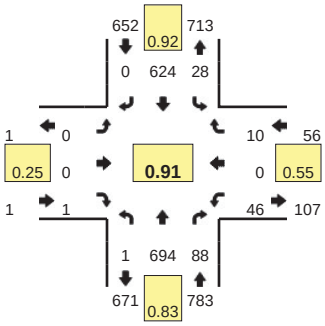
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- Woodcrest Dr/Spring Garden Rd

CITY/STATE: Blairs, VA

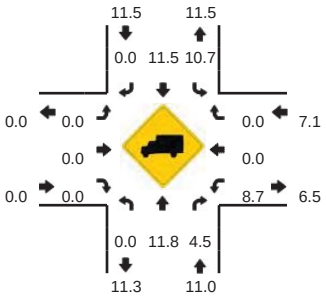
QC JOB #: 11206108

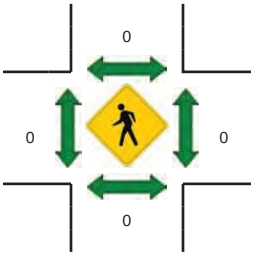
DATE: Tue, Sep 17 2013

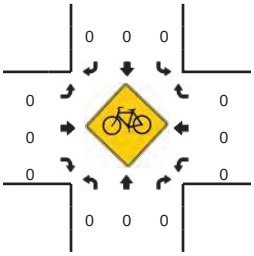


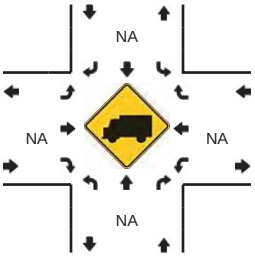
Peak-Hour: 4:45 PM -- 5:45 PM

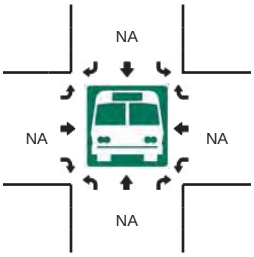
Peak 15-Min: 5:15 PM -- 5:30 PM











15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				Woodcrest Dr/Spring Garden Rd (Eastbound)				Woodcrest Dr/Spring Garden Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	162	15	0	1	178	0	1	0	0	0	0	9	0	2	0	368	
4:15 PM	0	145	17	0	3	121	0	4	0	0	0	0	23	0	5	0	318	
4:30 PM	0	137	17	0	0	148	0	1	0	0	0	0	5	0	1	0	309	
4:45 PM	0	157	10	0	5	170	0	3	0	0	0	0	13	0	4	0	362	1357
5:00 PM	0	167	24	0	3	161	0	3	0	0	0	0	9	0	2	0	369	1358
5:15 PM	1	206	29	0	6	150	0	2	0	0	0	0	13	0	2	0	409	1449
5:30 PM	0	164	25	0	5	143	0	1	0	0	1	0	11	0	2	0	352	1492
5:45 PM	0	151	18	0	4	128	1	2	0	0	0	0	10	0	4	0	318	1448

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	824	116	0	24	600	0	8	0	0	0	0	52	0	8	0	1636
Heavy Trucks	0	72	4		4	40	0		0	0	0		4	0	0		124
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

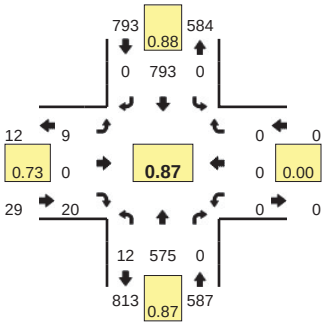
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- Georges Ln

CITY/STATE: Blairs, VA

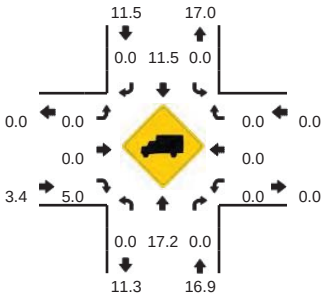
QC JOB #: 11206109

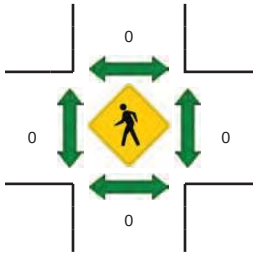
DATE: Tue, Sep 17 2013

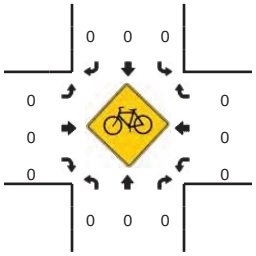


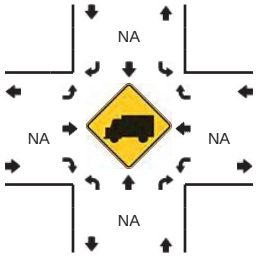
Peak-Hour: 7:30 AM -- 8:30 AM

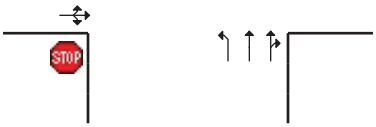
Peak 15-Min: 7:30 AM -- 7:45 AM

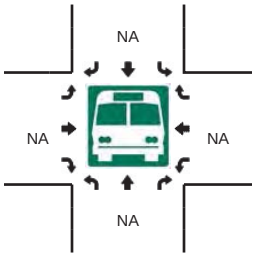












15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				Georges Ln (Eastbound)				Georges Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	95	0	0	0	132	0	0	2	0	1	0	0	0	0	0	231	
7:15 AM	2	127	0	0	0	187	1	2	1	0	1	0	0	0	0	0	321	
7:30 AM	2	166	0	0	0	227	0	0	2	0	8	0	0	0	0	0	405	
7:45 AM	1	163	0	0	0	212	0	0	2	0	4	0	0	0	0	0	382	1339
8:00 AM	3	119	0	0	0	167	0	0	3	0	3	0	0	0	0	0	295	1403
8:15 AM	6	127	0	0	0	187	0	0	2	0	5	0	0	0	0	0	327	1409
8:30 AM	1	89	0	0	0	179	0	0	0	0	3	0	0	0	0	0	272	1276
8:45 AM	2	114	0	0	0	159	0	0	0	0	1	0	0	0	0	0	276	1170

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	664	0	0	0	908	0	0	8	0	32	0	0	0	0	0	1620
Heavy Trucks	0	84	0		0	96	0		0	0	4		0	0	0		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

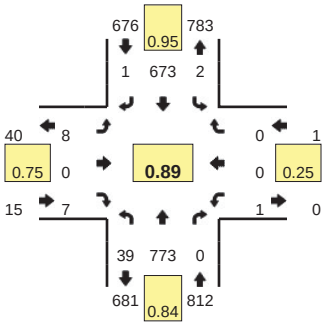
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

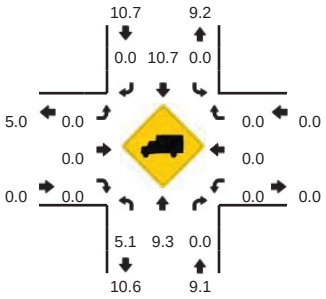
Method for determining peak hour: Total Entering Volume

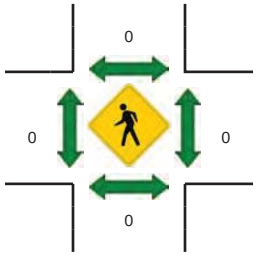
LOCATION: US Hwy 29 -- Georges Ln
CITY/STATE: Blairs, VA

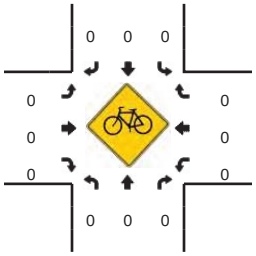
QC JOB #: 11206110
DATE: Tue, Sep 17 2013

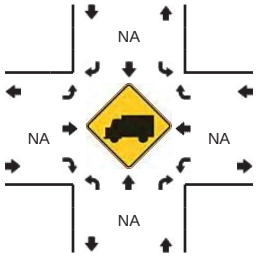


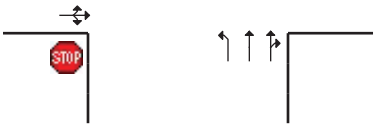
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

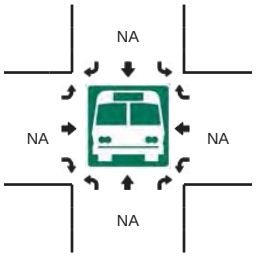












15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				Georges Ln (Eastbound)				Georges Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	172	0	0	0	183	0	0	3	0	1	0	0	0	0	0	364	
4:15 PM	3	160	0	1	0	153	0	0	0	0	2	0	0	0	0	0	319	
4:30 PM	4	151	0	0	0	159	0	0	2	0	2	0	0	0	0	0	318	
4:45 PM	12	162	0	0	0	178	0	1	2	0	1	0	0	0	0	0	356	1357
5:00 PM	7	188	0	0	0	173	0	0	5	0	1	0	0	0	0	0	374	1367
5:15 PM	13	233	0	0	0	167	1	1	0	0	5	0	1	0	0	0	421	1469
5:30 PM	7	190	0	0	0	155	0	0	1	0	0	0	0	0	0	0	353	1504
5:45 PM	15	171	0	0	0	132	0	0	1	0	1	0	0	0	0	0	320	1468

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	52	932	0	0	0	668	4	4	0	0	20	0	4	0	0	0	1684
Heavy Trucks	0	68	0		0	48	0		0	0	0		0	0	0		116
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

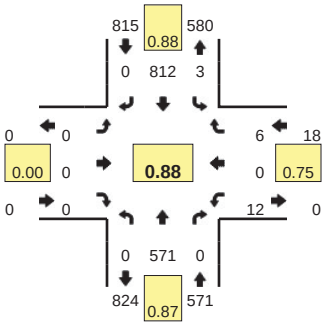
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- The Arc of Southside North Dwy

QC JOB #: 11206111

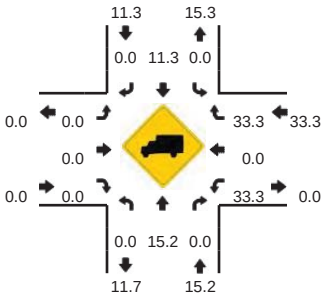
CITY/STATE: Blairs, VA

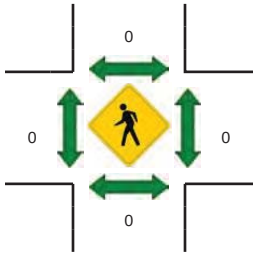
DATE: Tue, Sep 17 2013

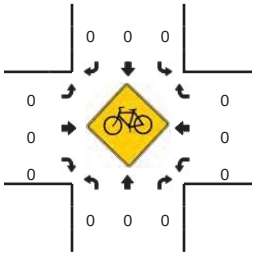


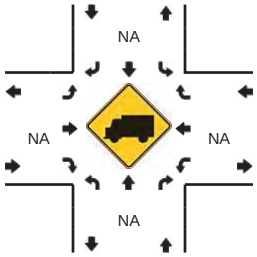
Peak-Hour: 7:15 AM -- 8:15 AM

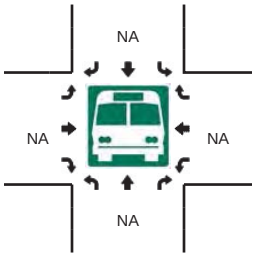
Peak 15-Min: 7:30 AM -- 7:45 AM











15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				The Arc of Southside North Dwy (Eastbound)				The Arc of Southside North Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	96	0	0	0	128	0	0	0	0	0	0	0	0	0	0	224	
7:15 AM	0	130	0	0	0	189	0	1	0	0	0	0	4	0	1	0	325	
7:30 AM	0	164	0	0	0	231	0	1	0	0	0	0	2	0	1	0	399	
7:45 AM	0	157	0	0	0	219	0	0	0	0	0	0	3	0	1	0	380	1328
8:00 AM	0	120	0	0	0	173	0	1	0	0	0	0	3	0	3	0	300	1404
8:15 AM	0	130	0	0	1	189	0	0	0	0	0	0	3	0	1	0	324	1403
8:30 AM	0	91	0	0	1	180	0	0	0	0	0	0	3	0	0	0	275	1279
8:45 AM	0	114	0	0	1	161	0	1	0	0	0	0	1	0	2	0	280	1179

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	656	0	0	0	924	0	4	0	0	0	0	8	0	4	0	1596
Heavy Trucks	0	88	0		0	100	0		0	0	0		0	0	0		188
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

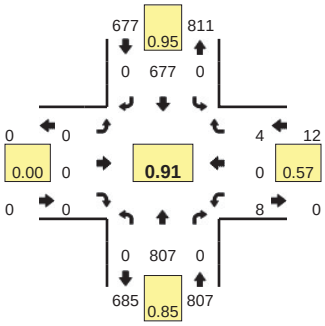
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- The Arc of Southside North Dwy

CITY/STATE: Blairs, VA

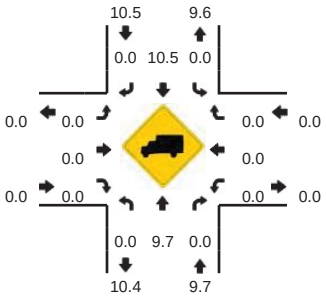
QC JOB #: 11206112

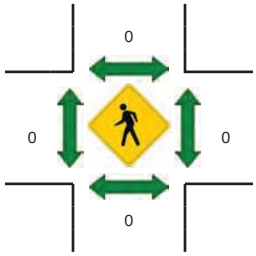
DATE: Tue, Sep 17 2013

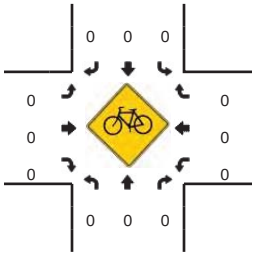


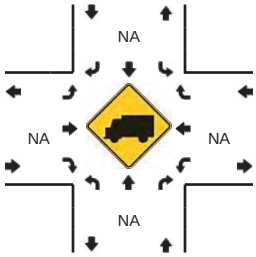
Peak-Hour: 4:45 PM -- 5:45 PM

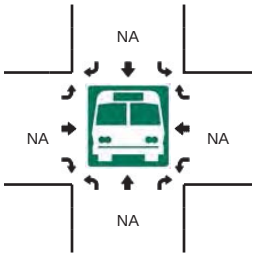
Peak 15-Min: 5:15 PM -- 5:30 PM











15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				The Arc of Southside North Dwy (Eastbound)				The Arc of Southside North Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	171	0	0	0	187	0	1	0	0	0	0	4	0	0	0	363	
4:15 PM	0	164	0	0	0	150	0	0	0	0	0	0	7	0	0	0	321	
4:30 PM	0	155	0	0	0	163	0	0	0	0	0	0	3	0	1	0	322	
4:45 PM	0	173	0	0	0	179	0	0	0	0	0	0	1	0	0	0	353	1359
5:00 PM	0	195	0	0	0	175	0	0	0	0	0	0	2	0	2	0	374	1370
5:15 PM	0	242	0	0	0	164	0	0	0	0	0	0	3	0	2	0	411	1460
5:30 PM	0	197	0	0	0	159	0	0	0	0	0	0	2	0	0	0	358	1496
5:45 PM	0	185	0	0	0	135	0	0	0	0	0	0	2	0	0	0	322	1465

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	968	0	0	0	656	0	0	0	0	0	0	12	0	8	0	1644
Heavy Trucks	0	68	0		0	48	0		0	0	0		0	0	0		116
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

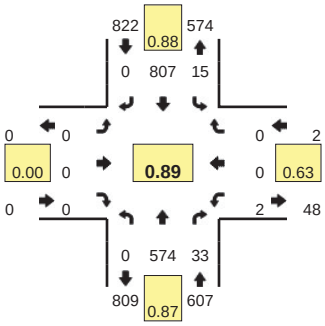
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- The Arc of Southside South Dwy

QC JOB #: 11206113

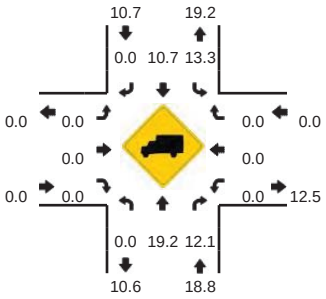
CITY/STATE: Blairs, VA

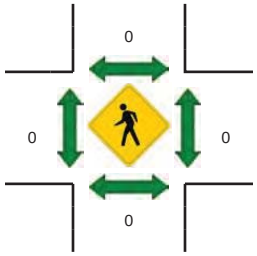
DATE: Tue, Sep 17 2013

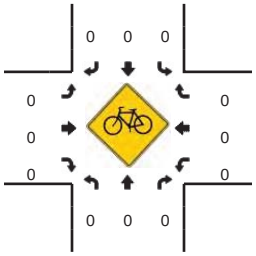


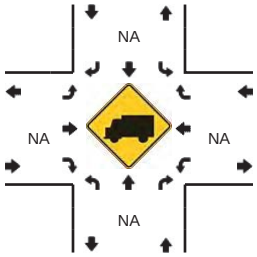
Peak-Hour: 7:30 AM -- 8:30 AM

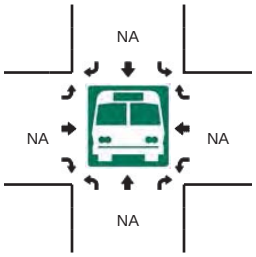
Peak 15-Min: 7:30 AM -- 7:45 AM











15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				The Arc of Southside South Dwy (Eastbound)				The Arc of Southside South Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	94	2	0	1	128	0	0	0	0	0	0	0	0	0	0	225	
7:15 AM	0	127	4	0	2	192	0	0	0	0	0	0	0	0	0	0	325	
7:30 AM	0	165	2	0	4	232	0	0	0	0	0	0	0	0	0	0	403	
7:45 AM	0	159	16	0	2	215	0	0	0	0	0	0	0	0	0	0	392	1345
8:00 AM	0	117	5	0	8	171	0	0	0	0	0	0	2	0	0	0	303	1423
8:15 AM	0	133	10	0	1	189	0	0	0	0	0	0	0	0	0	0	333	1431
8:30 AM	0	90	3	0	4	180	0	0	0	0	0	0	1	0	0	0	278	1306
8:45 AM	0	113	7	0	2	159	0	0	0	0	0	0	1	0	1	0	283	1197

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	660	8	0	16	928	0	0	0	0	0	0	0	0	0	0	1612
Heavy Trucks	0	108	0		0	92	0		0	0	0		0	0	0		200
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

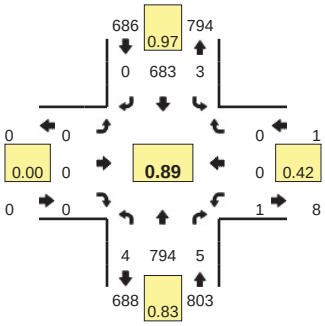
Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 -- The Arc of Southside South Dwy

QC JOB #: 11206114

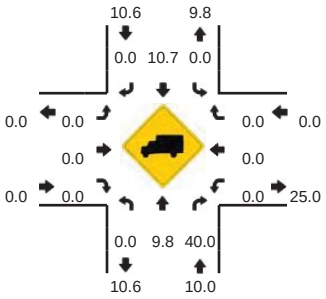
CITY/STATE: Blairs, VA

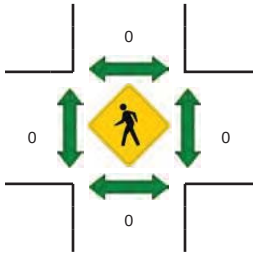
DATE: Tue, Sep 17 2013

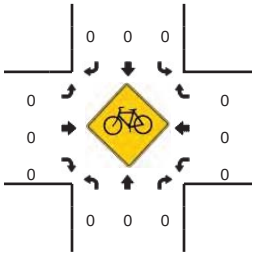


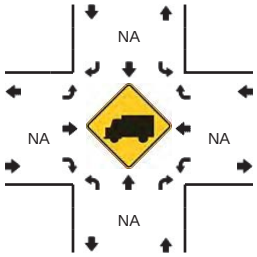
Peak-Hour: 4:45 PM -- 5:45 PM

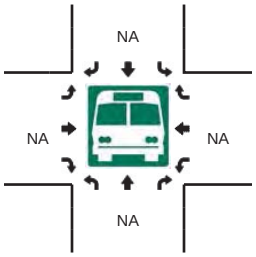
Peak 15-Min: 5:15 PM -- 5:30 PM











15-Min Count Period Beginning At	US Hwy 29 (Northbound)				US Hwy 29 (Southbound)				The Arc of Southside South Dwy (Eastbound)				The Arc of Southside South Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	175	0	0	0	190	0	0	0	0	0	0	1	0	0	0	366	
4:15 PM	0	164	1	0	3	155	0	0	0	0	0	0	3	0	0	0	326	
4:30 PM	0	157	1	0	0	169	0	0	0	0	0	0	1	0	0	0	328	
4:45 PM	0	175	1	1	1	174	0	0	0	0	0	0	0	0	0	0	352	1372
5:00 PM	0	184	2	1	1	178	0	0	0	0	0	0	1	0	0	0	367	1373
5:15 PM	0	243	2	1	1	170	0	0	0	0	0	0	0	0	0	0	417	1464
5:30 PM	0	192	0	1	0	161	0	0	0	0	0	0	0	0	0	0	354	1490
5:45 PM	0	188	0	0	0	134	0	0	0	0	0	0	2	0	0	0	324	1462

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	972	8	4	4	680	0	0	0	0	0	0	0	0	0	0	1668
Heavy Trucks	0	72	8		0	52	0		0	0	0		0	0	0		132
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

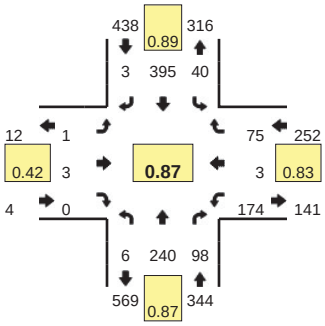
Type of peak hour being reported: Intersection Peak

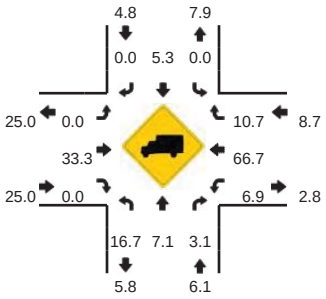
Method for determining peak hour: Total Entering Volume

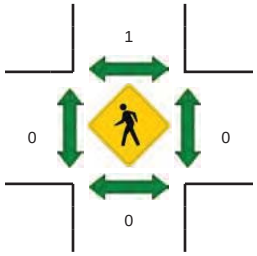
LOCATION: US Hwy 29 Bus -- Malmaison Rd
CITY/STATE: Blairs, VA

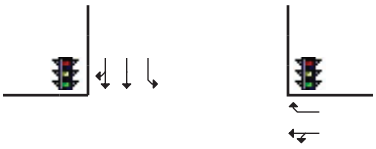
QC JOB #: 11206115
DATE: Tue, Sep 17 2013

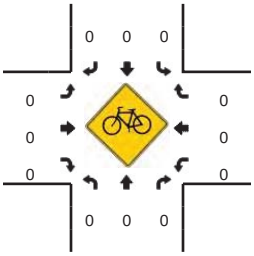
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

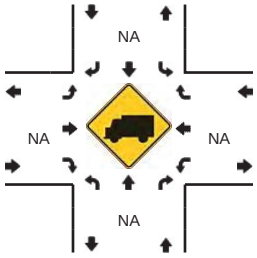


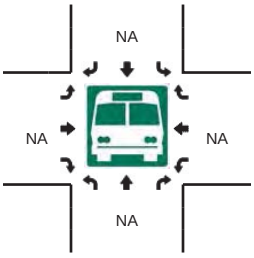












15-Min Count Period Beginning At	US Hwy 29 Bus (Northbound)				US Hwy 29 Bus (Southbound)				Malmaison Rd (Eastbound)				Malmaison Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	37	8	0	10	41	3	1	0	0	0	0	26	0	19	0	146	
7:15 AM	1	48	19	0	15	74	2	0	0	0	1	0	36	0	12	0	208	
7:30 AM	1	63	24	0	13	103	2	0	1	2	0	0	54	0	20	0	283	
7:45 AM	1	71	27	0	14	109	0	0	0	0	0	0	55	1	20	0	298	935
8:00 AM	1	56	33	0	4	90	0	0	0	0	0	0	36	1	12	0	233	1022
8:15 AM	3	50	14	0	9	93	1	0	0	1	0	0	29	1	23	0	224	1038
8:30 AM	2	38	15	0	10	92	1	0	2	1	0	0	27	0	13	0	201	956
8:45 AM	0	51	9	0	10	71	1	1	0	1	0	0	20	0	14	0	178	836

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	284	108	0	56	436	0	0	0	0	0	0	220	4	80	0	1192
Heavy Trucks	0	20	0		0	36	0		0	0	0		16	4	0		76
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: US Hwy 29 Bus -- Malmaison Rd

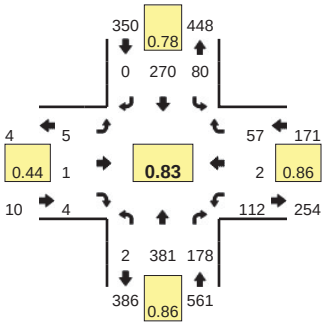
CITY/STATE: Blairs, VA

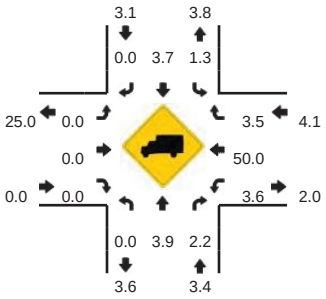
QC JOB #: 11206116

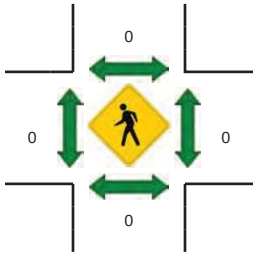
DATE: Tue, Sep 17 2013

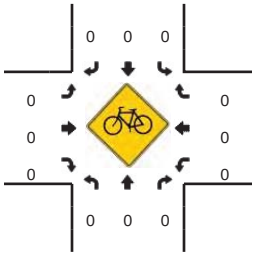
Peak-Hour: 5:00 PM -- 6:00 PM

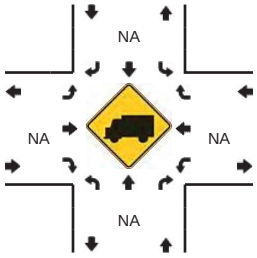
Peak 15-Min: 5:15 PM -- 5:30 PM

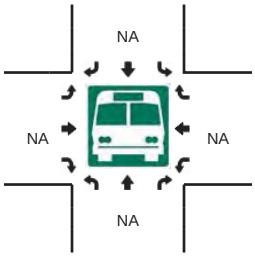












15-Min Count Period Beginning At	US Hwy 29 Bus (Northbound)				US Hwy 29 Bus (Southbound)				Malmaison Rd (Eastbound)				Malmaison Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	81	34	0	15	107	2	0	3	3	2	0	26	0	12	0	285	
4:15 PM	1	65	38	0	6	78	1	0	1	1	0	0	17	0	11	0	219	
4:30 PM	1	78	32	0	15	75	0	1	2	0	0	0	30	0	19	0	253	
4:45 PM	0	79	38	0	15	73	1	0	1	1	0	0	14	0	13	0	235	992
5:00 PM	0	89	49	0	20	59	0	0	3	1	1	0	27	1	18	0	268	975
5:15 PM	2	111	50	0	21	89	0	4	1	0	2	0	35	0	15	0	330	1086
5:30 PM	0	95	38	0	20	68	0	1	0	0	0	0	20	0	10	0	252	1085
5:45 PM	0	86	41	0	14	54	0	0	1	0	1	0	30	1	14	0	242	1092

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	444	200	0	84	356	0	16	4	0	8	0	140	0	60	0	1320
Heavy Trucks	0	16	8		0	12	0		0	0	0		4	0	0		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2013 9:26 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

APPENDIX B

LEVEL OF SERVICE METHODS AND CRITERIA

METHODOLOGY AND CRITERIA USED FOR THE LEVEL OF SERVICE ANALYSIS

All analyses were completed using the methodology outlined in the Highway Capacity Manual (HCM) 2010 published by the Transportation Research Board. The computer software package of Synchro (Version 8) was utilized to perform all signalized and unsignalized analyses at the study intersections.

The HCM 2010 defines capacity as "the maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions". Level of service (LOS) is a term used to represent different driving conditions, and is defined as "a qualitative stratification of a performance measure or measures that represent quality of service". Level of service varies from Level "A" representing free flow to Level "F" where greater vehicle delays are evident. Refer to the Table below for a summary of levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed". As shown in the Table, a control delay of 40 seconds at a signalized intersection results in a LOS D operation.

TABLE
HCM Levels of Service and Delay

Level of Service (LOS)	Control Delays (sec/vehc)	
	Signalized	**Unsignalized**
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

APPENDIX C

EXISTING (YEAR 2013) AND FUTURE NO-BUILD (YEAR 2035) INTERSECTION LEVEL OF SERVICE ANALYSIS

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	1	118	1	11	0	548	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	3	0	9	0	16	16
Mvmt Flow	0	0	1	136	1	13	0	630	29

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1161	1475	391	1083	1475	315	783	0	0
Stage 1	845	845	-	630	630	-	-	-	-
Stage 2	316	630	-	453	845	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.56	6.5	7.08	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.56	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.56	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.53	4	3.39	2.2	-	-
Pot Cap-1 Maneuver	153	128	614	170	128	661	844	-	-
Stage 1	328	382	-	434	478	-	-	-	-
Stage 2	675	478	-	553	382	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	145	124	614	165	124	661	844	-	-
Mov Cap-2 Maneuver	145	124	-	165	124	-	-	-	-
Stage 1	328	369	-	434	478	-	-	-	-
Stage 2	660	478	-	534	369	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.9	86.2	0
HCM LOS	B	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	844	-	-	614	176	935	-	-
HCM Lane V/C Ratio	-	-	-	0.002	0.849	0.033	-	-
HCM Control Delay (s)	0	-	-	10.9	86.2	9	-	-
HCM Lane LOS	A	-	-	B	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	6	0.1	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	27	681	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	87	87	87
Heavy Vehicles, %	4	13	0
Mvmt Flow	31	783	0

Major/Minor	Major2		
Conflicting Flow All	630	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.18	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.24	-	-
Pot Cap-1 Maneuver	935	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	935	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.3
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	20	12	575	793	0
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	5	0	17	12	0
Mvmt Flow	10	23	14	661	911	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1269	456	911	0	-	0
Stage 1	911	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.8	7	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	163	543	756	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	160	543	756	-	-	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.9	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	756	-	312	-	-
HCM Lane V/C Ratio	0.018	-	0.107	-	-
HCM Control Delay (s)	9.8	-	17.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	6	571	0	3	812
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	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	15	0	0	11
Mvmt Flow	14	7	649	0	3	923

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1117	324	0	0	649	0
Stage 1	649	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	204	678	-	-	947	-
Stage 1	487	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	203	678	-	-	947	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	600	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	947	-
HCM Lane V/C Ratio	-	-	0.077	0.004	-
HCM Control Delay (s)	-	-	19.7	8.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	2	0	574	33	15	807
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	-	-	165	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	19	12	13	11
Mvmt Flow	2	0	645	37	17	907

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1132	322	0	0	645	0
Stage 1	645	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.36	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.33	-
Pot Cap-1 Maneuver	200	680	-	-	865	-
Stage 1	490	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	196	680	-	-	865	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	577	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.6	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	196	865	-
HCM Lane V/C Ratio	-	-	0.011	0.019	-
HCM Control Delay (s)	-	-	23.6	9.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0.1	-

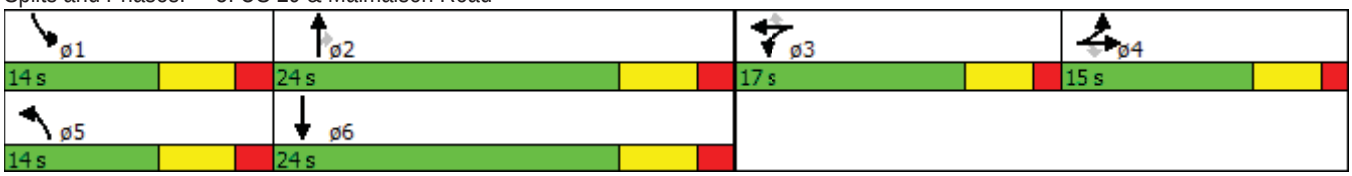
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	3	0	174	3	75	6	240	98	40	395	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	11	12	12	12
Storage Length (ft)	0		15	0		0	325		285	200		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			100			150		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt						0.850			0.850		0.999	
Flt Protected		0.988			0.953		0.950			0.950		
Satd. Flow (prot)	0	1505	1900	0	1678	1455	1440	1717	1516	1805	3436	0
Flt Permitted		0.988			0.953		0.950			0.950		
Satd. Flow (perm)	0	1505	1900	0	1678	1455	1440	1717	1516	1805	3436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						218			203		1	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		346			377			620			693	
Travel Time (s)		5.2			5.7			9.4			10.5	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	33%	0%	7%	67%	11%	17%	7%	3%	0%	5%	0%
Adj. Flow (vph)	1	3	0	200	3	86	7	276	113	46	454	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	203	86	7	276	113	46	457	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	8.0	17.0	17.0	8.0	17.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	14.0	23.0	23.0	14.0	23.0	
Total Split (s)	15.0	15.0	15.0	17.0	17.0	17.0	14.0	24.0	24.0	14.0	24.0	
Total Split (%)	21.4%	21.4%	21.4%	24.3%	24.3%	24.3%	20.0%	34.3%	34.3%	20.0%	34.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	
Act Effct Green (s)		10.5			11.7	11.7	8.4	20.4	20.4	8.4	22.9	
Actuated g/C Ratio		0.21			0.23	0.23	0.17	0.41	0.41	0.17	0.46	
v/c Ratio		0.01			0.52	0.17	0.03	0.40	0.15	0.15	0.29	
Control Delay		22.3			26.3	0.7	23.8	16.9	0.7	23.8	11.9	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		22.3			26.3	0.7	23.8	16.9	0.7	23.8	11.9	
LOS		C			C	A	C	B	A	C	B	
Approach Delay		22.3			18.7			12.4			13.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		1			35	0	1	39	0	9	32	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		9			#164	0	13	173	1	46	126	
Internal Link Dist (ft)		266			297			540			613	
Turn Bay Length (ft)							325		285	200		
Base Capacity (vph)		314			420	528	240	712	747	301	1601	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.01			0.48	0.16	0.03	0.39	0.15	0.15	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 50.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 51.5% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: US 29 & Malmaison Road



Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	1	46	0	10	1	694	88
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	9	0	0	0	12	5
Mvmt Flow	0	0	1	51	0	11	1	763	97

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1111	1492	343	1150	1492	381	686	0	0
Stage 1	727	727	-	765	765	-	-	-	-
Stage 2	384	765	-	385	727	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.68	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.68	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.68	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.59	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	166	125	659	145	125	623	917	-	-
Stage 1	386	432	-	347	415	-	-	-	-
Stage 2	616	415	-	591	432	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	160	121	659	142	121	623	917	-	-
Mov Cap-2 Maneuver	160	121	-	142	121	-	-	-	-
Stage 1	385	421	-	346	414	-	-	-	-
Stage 2	604	414	-	574	421	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.5	39.2	0
HCM LOS	B	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	917	-	-	659	165	789	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.373	0.026	-	-
HCM Control Delay (s)	8.9	0	-	10.5	39.2	9.7	-	-
HCM Lane LOS	A	A	-	B	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.6	0.1	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	19	624	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	91	91	91
Heavy Vehicles, %	11	12	0
Mvmt Flow	21	686	0

Major/Minor	Major2		
Conflicting Flow All	763	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.32	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.31	-	-
Pot Cap-1 Maneuver	789	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	789	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.3
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	8	0	7	0	0	0	39	773	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	5	9	0
Mvmt Flow	9	0	8	0	0	0	44	869	0

Major/Minor	Minor2						Major1		
Conflicting Flow All	1283	1717	379				757	0	0
Stage 1	761	761	-				-	-	-
Stage 2	522	956	-				-	-	-
Critical Hdwy	6.8	6.5	6.9				4.2	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-
Follow-up Hdwy	3.5	4	3.3				2.25	-	-
Pot Cap-1 Maneuver	160	91	625				830	-	-
Stage 1	427	417	-				-	-	-
Stage 2	566	339	-				-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	151	0	625				830	-	-
Mov Cap-2 Maneuver	151	0	-				-	-	-
Stage 1	425	0	-				-	-	-
Stage 2	536	0	-				-	-	-

Approach	EB	NB
HCM Control Delay, s	21.6	0.5
HCM LOS	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	830	-	-	234	784	-	-
HCM Lane V/C Ratio	0.053	-	-	0.072	0.003	-	-
HCM Control Delay (s)	9.6	-	-	21.6	9.6	0	-
HCM Lane LOS	A	-	-	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	2	673	1
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	0	11	0
Mvmt Flow	2	756	1

Major/Minor	Major2		
Conflicting Flow All	869	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	784	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	784	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	8	4	807	0	0	677
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	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	10	0	0	11
Mvmt Flow	9	4	887	0	0	744

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1259	443	0	0	887	0
Stage 1	887	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	165	568	-	-	772	-
Stage 1	368	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	568	-	-	772	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	368	-	-	-	-	-
Stage 2	673	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	216	772	-
HCM Lane V/C Ratio	-	-	0.061	-	-
HCM Control Delay (s)	-	-	22.7	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	0	1	0	0	4	794	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	105	-	165
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	10	40
Mvmt Flow	0	0	0	1	0	0	4	892	6

Major/Minor	Minor1			Major1		
Conflicting Flow All	1291	1675	446	767	0	0
Stage 1	901	901	-	-	-	-
Stage 2	390	774	-	-	-	-
Critical Hdwy	6.8	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	158	96	565	856	-	-
Stage 1	362	360	-	-	-	-
Stage 2	659	411	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	157	0	565	856	-	-
Mov Cap-2 Maneuver	157	0	-	-	-	-
Stage 1	360	0	-	-	-	-
Stage 2	656	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	28.1	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	856	-	-	157	769	-	-
HCM Lane V/C Ratio	0.005	-	-	0.007	0.004	-	-
HCM Control Delay (s)	9.2	-	-	28.1	9.7	-	-
HCM Lane LOS	A	-	-	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	3	683	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	110	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	0	11	0
Mvmt Flow	3	767	0

Major/Minor	Major2		
Conflicting Flow All	892	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	769	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	769	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0
HCM LOS	

Minor Lane/Major Mvmt

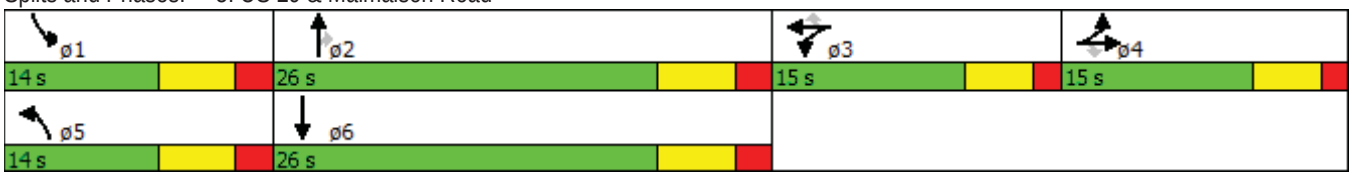
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1	4	112	2	57	6	381	178	75	270	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	11	12	12	12
Storage Length (ft)	0		15	0		0	325		285	200		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			100			150		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850			
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1822	1615	0	1730	1553	1685	1766	1531	1787	3471	0
Flt Permitted		0.959			0.953		0.950			0.950		
Satd. Flow (perm)	0	1822	1615	0	1730	1553	1685	1766	1531	1787	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			218			218			214			
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		346			377			620			693	
Travel Time (s)		5.2			5.7			9.4			10.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	4%	50%	4%	0%	4%	2%	1%	4%	0%
Adj. Flow (vph)	6	1	5	135	2	69	7	459	214	90	325	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	7	5	0	137	69	7	459	214	90	325	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	8.0	17.0	17.0	8.0	17.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	14.0	23.0	23.0	14.0	23.0	
Total Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	14.0	26.0	26.0	14.0	26.0	
Total Split (%)	21.4%	21.4%	21.4%	21.4%	21.4%	21.4%	20.0%	37.1%	37.1%	20.0%	37.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	
Act Effct Green (s)		10.4	10.4		10.4	10.4	8.3	26.0	26.0	8.3	34.3	
Actuated g/C Ratio		0.19	0.19		0.19	0.19	0.15	0.48	0.48	0.15	0.63	
v/c Ratio		0.02	0.01		0.42	0.15	0.03	0.55	0.26	0.33	0.15	
Control Delay		22.8	0.0		27.6	0.6	24.7	21.7	4.0	28.2	9.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		22.8	0.0		27.6	0.6	24.7	21.7	4.0	28.2	9.4	
LOS		C	A		C	A	C	C	A	C	A	
Approach Delay		13.3			18.6			16.2			13.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		2	0		40	0	2	125	0	27	19	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		12	0		99	0	13	#311	35	72	82	
Internal Link Dist (ft)		266			297			540			613	
Turn Bay Length (ft)			15				325		285	200		
Base Capacity (vph)		346	484		329	471	256	839	839	271	2179	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.02	0.01		0.42	0.15	0.03	0.55	0.26	0.33	0.15	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 54.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 15.7 Intersection LOS: B
Intersection Capacity Utilization 53.9% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: US 29 & Malmaison Road



Intersection	
Int Delay, s/veh	280.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	2	251	2	23	0	943	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	3	0	9	0	16	16
Mvmt Flow	0	0	2	289	2	26	0	1084	61

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1933	2474	673	1801	2474	542	1346	0	0
Stage 1	1390	1390	-	1084	1084	-	-	-	-
Stage 2	543	1084	-	717	1390	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.56	6.5	7.08	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.56	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.56	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.53	4	3.39	2.2	-	-
Pot Cap-1 Maneuver	41	30	402	~ 49	30	467	518	-	-
Stage 1	152	211	-	~ 230	296	-	-	-	-
Stage 2	497	296	-	384	211	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	35	29	402	~ 47	29	467	518	-	-
Mov Cap-2 Maneuver	35	29	-	~ 47	29	-	-	-	-
Stage 1	152	204	-	~ 230	296	-	-	-	-
Stage 2	465	296	-	368	204	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	14	$ 2506.1	0
HCM LOS	B	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	518	-	-	402	51	628	-	-
HCM Lane V/C Ratio	-	-	-	0.006	6.22	0.035	-	-
HCM Control Delay (s)	0	-	-	14	$ 2506.1	10.9	-	-
HCM Lane LOS	A	-	-	B	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	36.5	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	19	1171	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	87	87	87
Heavy Vehicles, %	4	13	0
Mvmt Flow	22	1346	0

Major/Minor	Major2		
Conflicting Flow All	1084	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.18	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.24	-	-
Pot Cap-1 Maneuver	628	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	628	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.2
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	15	34	21	989	1364	0
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	5	0	17	12	0
Mvmt Flow	17	39	24	1137	1568	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2185	784	1568	0	-	0
Stage 1	1568	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Critical Hdwy	6.8	7	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	40	330	426	-	-	-
Stage 1	160	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	38	330	426	-	-	-
Mov Cap-2 Maneuver	38	-	-	-	-	-
Stage 1	160	-	-	-	-	-
Stage 2	477	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	82.6	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	426	-	98	-	-
HCM Lane V/C Ratio	0.057	-	0.575	-	-
HCM Control Delay (s)	14	-	82.6	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.2	-	2.7	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	21	10	982	0	5	1397
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	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	15	0	0	11
Mvmt Flow	24	11	1116	0	6	1588

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1921	558	0	0	1116	0
Stage 1	1116	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	60	478	-	-	633	-
Stage 1	279	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	59	478	-	-	633	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	279	-	-	-	-	-
Stage 2	401	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	78.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	82	633	-
HCM Lane V/C Ratio	-	-	0.43	0.009	-
HCM Control Delay (s)	-	-	78.5	10.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	1.7	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	3	0	987	57	26	1388
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	-	-	165	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	19	12	13	11
Mvmt Flow	3	0	1109	64	29	1560

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1947	554	0	0	1109	0
Stage 1	1109	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.36	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.33	-
Pot Cap-1 Maneuver	58	481	-	-	565	-
Stage 1	282	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	55	481	-	-	565	-
Mov Cap-2 Maneuver	55	-	-	-	-	-
Stage 1	282	-	-	-	-	-
Stage 2	370	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	74.7	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	55	565	-
HCM Lane V/C Ratio	-	-	0.061	0.052	-
HCM Control Delay (s)	-	-	74.7	11.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-

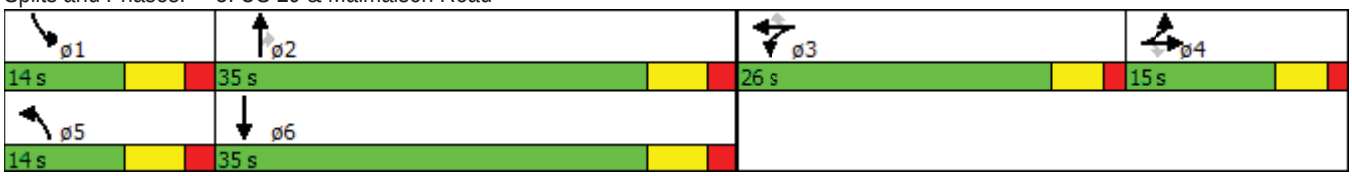
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	5	0	299	5	129	10	413	169	69	679	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	11	12	12	12
Storage Length (ft)	0		15	0		0	325		285	200		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			100			150		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt						0.850			0.850		0.999	
Flt Protected		0.988			0.953		0.950			0.950		
Satd. Flow (prot)	0	1505	1900	0	1676	1455	1440	1717	1516	1805	3436	0
Flt Permitted		0.988			0.953		0.950			0.950		
Satd. Flow (perm)	0	1505	1900	0	1676	1455	1440	1717	1516	1805	3436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						170			194		1	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		346			377			620			693	
Travel Time (s)		5.2			5.7			9.4			10.5	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	33%	0%	7%	67%	11%	17%	7%	3%	0%	5%	0%
Adj. Flow (vph)	2	6	0	344	6	148	11	475	194	79	780	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	350	148	11	475	194	79	786	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	8.0	17.0	17.0	8.0	17.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	14.0	23.0	23.0	14.0	23.0	
Total Split (s)	15.0	15.0	15.0	26.0	26.0	26.0	14.0	35.0	35.0	14.0	35.0	
Total Split (%)	16.7%	16.7%	16.7%	28.9%	28.9%	28.9%	15.6%	38.9%	38.9%	15.6%	38.9%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	
Act Effct Green (s)		10.7			20.1	20.1	8.5	26.2	26.2	8.5	34.3	
Actuated g/C Ratio		0.15			0.28	0.28	0.12	0.37	0.37	0.12	0.49	
v/c Ratio		0.04			0.74	0.28	0.06	0.75	0.28	0.36	0.47	
Control Delay		33.0			37.6	5.0	35.3	30.9	4.6	39.5	15.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		33.0			37.6	5.0	35.3	30.9	4.6	39.5	15.3	
LOS		C			D	A	D	C	A	D	B	
Approach Delay		33.0			27.9			23.5			17.5	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)		3			147	0	5	182	0	35	96	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		17			#333	32	22	#400	41	86	258	
Internal Link Dist (ft)		266			297			540			613	
Turn Bay Length (ft)							325		285	200		
Base Capacity (vph)		227			531	577	174	752	773	218	1862	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.04			0.66	0.26	0.06	0.63	0.25	0.36	0.42	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 70.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 22.1 Intersection LOS: C
Intersection Capacity Utilization 66.1% 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: 5: US 29 & Malmaison Road



Intersection	
Int Delay, s/veh	64.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	2	98	0	21	2	1194	187
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	9	0	0	0	12	5
Mvmt Flow	0	0	2	108	0	23	2	1312	205

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1927	2583	590	1993	2583	656	1179	0	0
Stage 1	1267	1267	-	1316	1316	-	-	-	-
Stage 2	660	1316	-	677	1267	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.68	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.68	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.68	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.59	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	41	26	456	~ 33	26	413	600	-	-
Stage 1	182	242	-	157	229	-	-	-	-
Stage 2	423	229	-	393	242	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	35	23	456	~ 30	23	413	600	-	-
Mov Cap-2 Maneuver	35	23	-	~ 30	23	-	-	-	-
Stage 1	177	220	-	153	223	-	-	-	-
Stage 2	389	223	-	355	220	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	12.9	$ 1414.4	0.1
HCM LOS	B	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	600	-	-	456	36	478	-	-
HCM Lane V/C Ratio	0.004	-	-	0.005	3.632	0.092	-	-
HCM Control Delay (s)	11	0.1	-	12.9	$ 1414.4	13.3	-	-
HCM Lane LOS	B	A	-	B	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	15.1	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	40	1073	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	91	91	91
Heavy Vehicles, %	11	12	0
Mvmt Flow	44	1179	0

Major/Minor	Major2		
Conflicting Flow All	1312	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.32	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.31	-	-
Pot Cap-1 Maneuver	478	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	478	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.5
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	14	0	12	0	0	0	67	1330	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	5	9	0
Mvmt Flow	16	0	13	0	0	0	75	1494	0

Major/Minor	Minor2						Major1		
Conflicting Flow All	2207	2954	652				1303	0	0
Stage 1	1309	1309	-				-	-	-
Stage 2	898	1645	-				-	-	-
Critical Hdwy	6.8	6.5	6.9				4.2	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-
Follow-up Hdwy	3.5	4	3.3				2.25	-	-
Pot Cap-1 Maneuver	39	15	415				511	-	-
Stage 1	221	231	-				-	-	-
Stage 2	363	159	-				-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	32	0	415				511	-	-
Mov Cap-2 Maneuver	32	0	-				-	-	-
Stage 1	216	0	-				-	-	-
Stage 2	310	0	-				-	-	-

Approach	EB	NB
HCM Control Delay, s	125	0.6
HCM LOS	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	511	-	-	56	455	-	-
HCM Lane V/C Ratio	0.147	-	-	0.522	0.007	-	-
HCM Control Delay (s)	13.3	-	-	125	13	0.2	-
HCM Lane LOS	B	-	-	F	B	A	-
HCM 95th %tile Q(veh)	0.5	-	-	2	0	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	3	1158	2
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	0	11	0
Mvmt Flow	3	1301	2

Major/Minor	Major2		
Conflicting Flow All	1494	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	455	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	455	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.2
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	14	7	1388	0	0	1164
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	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	10	0	0	11
Mvmt Flow	15	8	1525	0	0	1279

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2165	763	0	0	1525	0
Stage 1	1525	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	41	351	-	-	443	-
Stage 1	169	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	351	-	-	443	-
Mov Cap-2 Maneuver	41	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	103.3	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	58	443	-
HCM Lane V/C Ratio	-	-	0.398	-	-
HCM Control Delay (s)	-	-	103.3	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	0	2	0	0	7	1366	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	105	-	165
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	10	40
Mvmt Flow	0	0	0	2	0	0	8	1535	10

Major/Minor	Minor1			Major1		
Conflicting Flow All	2222	2882	767	1320	0	0
Stage 1	1551	1551	-	-	-	-
Stage 2	671	1331	-	-	-	-
Critical Hdwy	6.8	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	38	17	349	530	-	-
Stage 1	164	177	-	-	-	-
Stage 2	475	226	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	37	0	349	530	-	-
Mov Cap-2 Maneuver	37	0	-	-	-	-
Stage 1	162	0	-	-	-	-
Stage 2	469	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	108.5	0.1
HCM LOS	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	37	439	-	-
HCM Lane V/C Ratio	0.015	-	-	0.061	0.013	-	-
HCM Control Delay (s)	11.9	-	-	108.5	13.3	-	-
HCM Lane LOS	B	-	-	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	5	1175	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	110	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	0	11	0
Mvmt Flow	6	1320	0

Major/Minor	Major2		
Conflicting Flow All	1535	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	439	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	439	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.1
HCM LOS	

Minor Lane/Major Mvmt

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	2	7	193	3	98	3	655	306	129	464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	11	12	12	12
Storage Length (ft)	0		15	0		0	325		285	200		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			100			150		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850			
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1822	1615	0	1728	1553	1685	1766	1531	1787	3471	0
Flt Permitted		0.959			0.953		0.950			0.950		
Satd. Flow (perm)	0	1822	1615	0	1728	1553	1685	1766	1531	1787	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			170			170			369			
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		346			377			620			693	
Travel Time (s)		5.2			5.7			9.4			10.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	4%	50%	4%	0%	4%	2%	1%	4%	0%
Adj. Flow (vph)	11	2	8	233	4	118	4	789	369	155	559	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	8	0	237	118	4	789	369	155	559	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	8.0	17.0	17.0	8.0	17.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	14.0	23.0	23.0	14.0	23.0	
Total Split (s)	15.0	15.0	15.0	17.0	17.0	17.0	14.0	44.0	44.0	14.0	44.0	
Total Split (%)	16.7%	16.7%	16.7%	18.9%	18.9%	18.9%	15.6%	48.9%	48.9%	15.6%	48.9%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	
Act Effct Green (s)		10.1	10.1		12.1	12.1	8.1	38.3	38.3	8.1	49.9	
Actuated g/C Ratio		0.12	0.12		0.15	0.15	0.10	0.47	0.47	0.10	0.62	
v/c Ratio		0.06	0.02		0.92	0.31	0.02	0.95	0.40	0.88	0.26	
Control Delay		35.5	0.1		77.0	4.3	37.0	44.3	3.4	81.8	9.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		35.5	0.1		77.0	4.3	37.0	44.3	3.4	81.8	9.8	
LOS		D	A		E	A	D	D	A	F	A	
Approach Delay		22.0			52.9			31.3			25.4	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)		5	0		109	0	2	307	0	72	41	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		22	0		#257	11	11	#626	35	#188	138	
Internal Link Dist (ft)		266			297			540			613	
Turn Bay Length (ft)			15				325		285	200		
Base Capacity (vph)		226	349		258	376	167	834	918	177	2138	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.06	0.02		0.92	0.31	0.02	0.95	0.40	0.88	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 81
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 32.7 Intersection LOS: C
Intersection Capacity Utilization 73.3% 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.

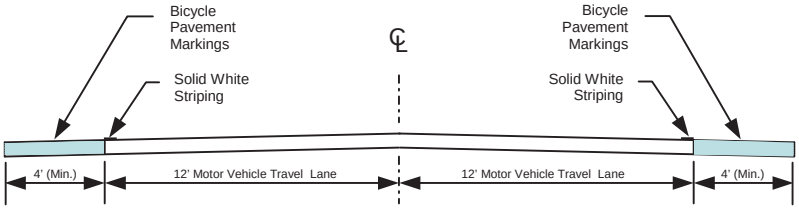
Splits and Phases: 5: US 29 & Malmaison Road

APPENDIX D

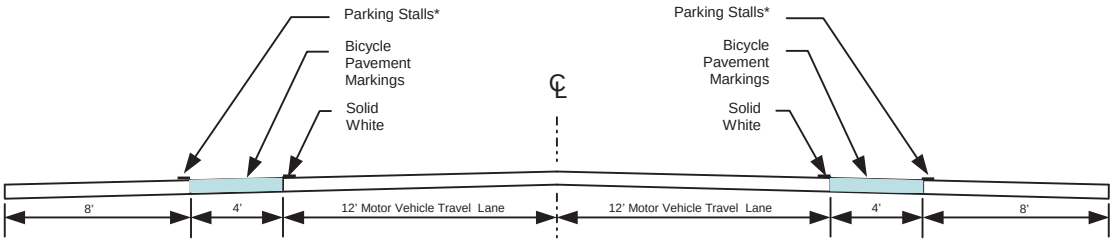
ROADWAY TYPICAL SECTIONS TO SUPPORT BIKE FACILITIES

APPENDIX I – SAMPLE BICYCLE FACILITY CROSS-SECTIONS

(Note: Cross-sections shown below have been adapted from those shown in the *Virginia Bicycle Facility Resource Guide*, 2002. Sections are not to scale. It is recommended that the designer consult the most current VDOT and AASHTO standards prior to initiating design of typical sections.)

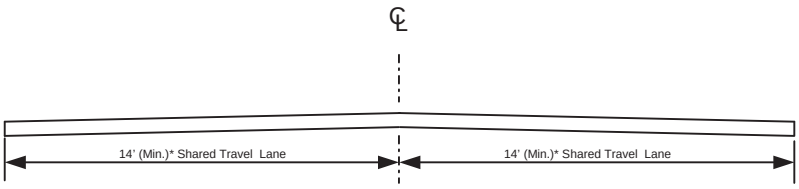


Bicycle Lane



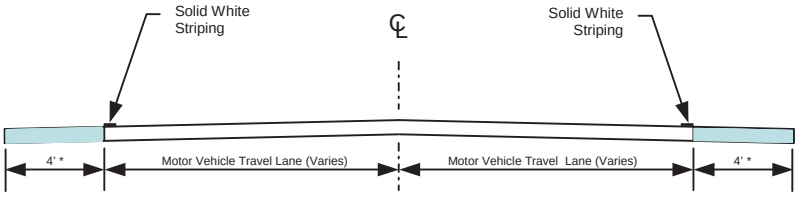
Bicycle Lane with Parking

* Solid white striping may be advisable as parking stall pavement markings are not



Wide Outside (Curb) Lane

* Additional width may be needed due to traffic flow/cross-section characteristics.



Paved Shoulder

* Width may vary depending on a combination of potential widening impacts and traffic flow/cross-section characteristics.

APPENDIX E

CRASH DATA SUMMARY

Buffer Search Radius: 100'

Route 29 and 640 Intersection

No.	Document Number	VDOT Physical Jurisdiction	Route Number	Crash Date	Crash Time	Day Of Week	Collision Type	Crash Severity	Roadway Alignment Type	Light Condition	Roadway Surface Cond Type	Weather Condition Type	Listed in Segments
1	110450009	Pittsylvania County	29	12/13/2010	9:00	Mon	2. Angle	injury crash	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	Yes
2	110705093	Pittsylvania County	999999	3/11/2011	13:50	Fri	2. Angle	property damage crash	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	No
3	112765084	Pittsylvania County	29	10/2/2011	12:42	Sun	9. Fixed Object - Off Road	property damage crash	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	Yes

Route 29 and 946 Intersection

No.	Document Number	VDOT Physical Jurisdiction	Route Number	Crash Date	Crash Time	Day Of Week	Collision Type	Crash Severity	Roadway Alignment Type	Light Condition	Roadway Surface Cond Type	Weather Condition Type	Listed in Segments
1	112595066	Pittsylvania County	29	9/7/2011	21:25	Wed	2. Angle	injury crash	1. Straight - Level	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	Yes

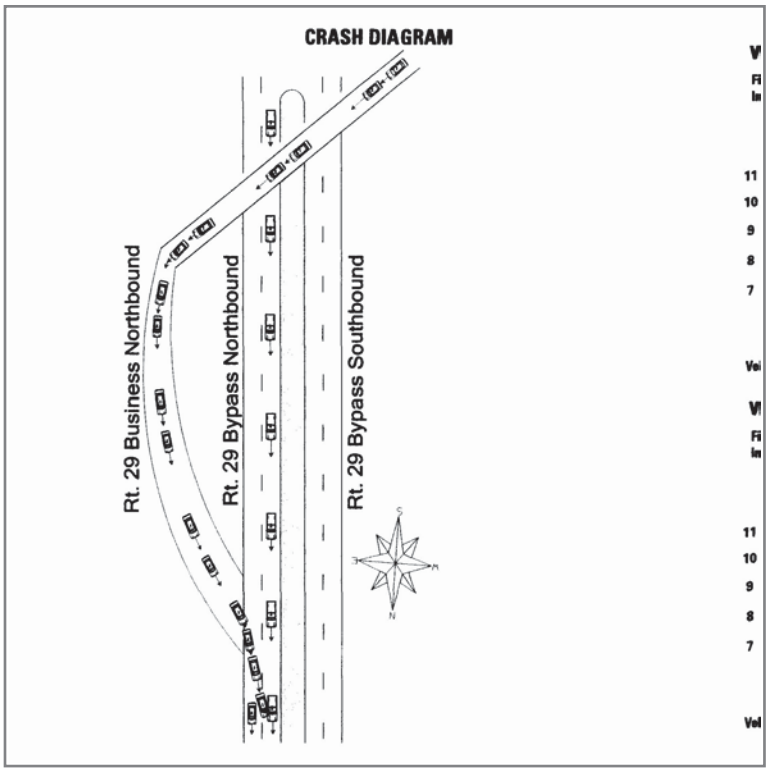
Route 29 Bus and 726 Intersection

No.	Document Number	VDOT Physical Jurisdiction	Route Number	Crash Date	Crash Time	Day Of Week	Collision Type	Crash Severity	Roadway Alignment Type	Light Condition	Roadway Surface Cond Type	Weather Condition Type	Listed in Segments
1	111985050	Pittsylvania County	29	7/14/2011	8:50	Thu	2. Angle	injury crash	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	Yes
2	123305098	Pittsylvania County	29	11/20/2012	7:30	Tue	2. Angle	property damage crash	3. Grade - Straight	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	Yes
3	123555286	Pittsylvania County	29	12/20/2012	17:36	Thu	1. Rear End	property damage crash	1. Straight - Level	4. Darkness - Road Lighted	2. Wet	5. Rain	No

Crash Report

Document Number	110120590	Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0	County of Crash	Pittsylvania County	36.704050	-79.370770
Crash Date	Wednesday 11/03/2010 1645	Landmarks at Scene			
City / Town of		Railroad Crossing ID			
Location of Crash	rt 29 bypass northboud			Mile Marker Number	Number of Vehicles
	Yes - At Intersection With or 0.00 Not Provided Not Provided of rt 29 busness northbound			0.00	2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	6. Intersection at end of Ramp
Light Condition	3. Dusk	Intersection Type	2. Two Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	4. Sideswipe - Same Direction

Crash Description

VEHICLE 1 WAS ArrEMPTING TO CHANGE LANES TO PASS A SLOWER MOVING VEHICLE AND STRUCK VEHICLE 2 IN THE SIDE. VEHICLE 2WAS IN VEHICLE 1'S BLIND SPOT.VEHICLE X IS SHOWN FOR CLARIFICATION ONLYCRASHEVENTS

Crash Report

Driver Information 01/23/1965 Age 45

Driver's Action	42. Improper or Unsafe Lane Change
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	14. Blind Spot
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Vehicle Information 1

Vehicle Maneuver	14. Changing Lanes
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	10. Left side - front
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	No
Underride	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
50	60	60	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 03/25/1940 Age 70

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable	Vehicle Body Type	2. Truck - Pick-up/Passenger Truck
Drinking	1. Had Not Been Drinking		
Method of Alcohol Determination	Not Applicable	Vehicle Damage	8. Other
Drug Use	2. No	Vehicle Condition	1. No Defects
Driver's License		Spec. Function Motor Vehicle	Not Applicable
Commercial Driver's License	NotProvided	EMV in service	Not Applicable
Safety Equipment Used	3. Lap and Shoulder Belt	Truck Cover	Not Applicable
Air Bag	2. Not Deployed	Vehicle Disabled	No
Ejected from Vehicle	1. Not Ejected	Commercial Motor Vehicle	No
Date of Death		Towed	No
Injury Type	6. No Injury (driver only)	Oversized	No
		Override	No
EMS Transport	No	Initial Impact Area	2. Right side - front
Summons Issued	2. No	Direction of Travel	North
		Crash Events: 1.	Not Provided
		2.	Not Provided
		3.	Not Provided
		4.	Not Provided
		Most Harmful	Not Provided

Cargo Spill	No
Underride	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count			
			< 8	8-17	18-21	> 21
60	60	60	0	0	0	1

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

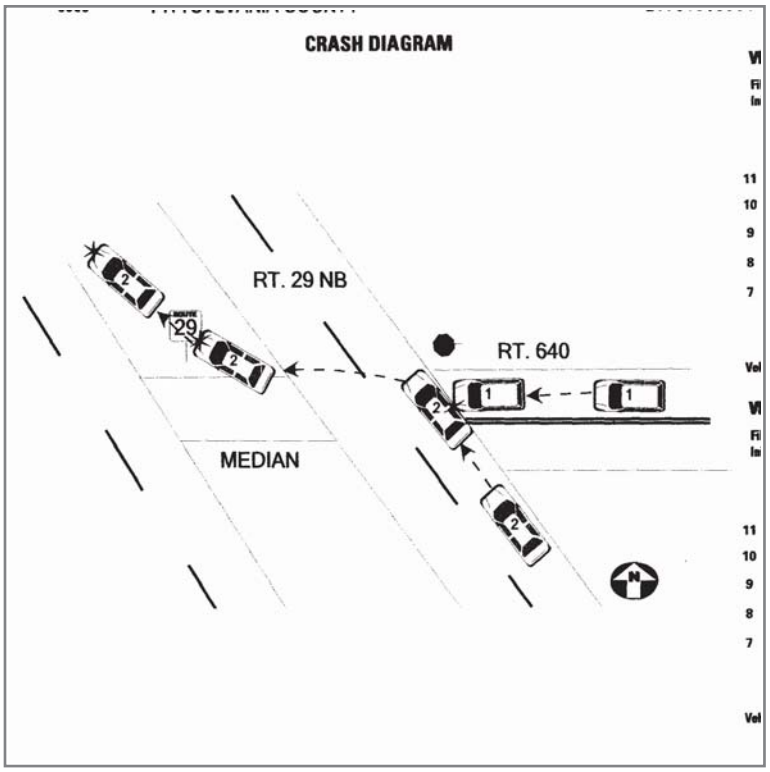
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	110450009			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	Pittsylvania County	36.713740	-79.377250
Crash Date	Monday	12/13/2010	900	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	29 Yes - At Intersection With or 0.00 Not Provided Not Provided of 640					Mile Marker Number 0.00	Number of Vehicles 2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	3
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	2. Daylight	Intersection Type	3. Three Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	4. Stop Sign	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	1. Two-Way, Not Divided	Type of Collision	2. Angle

Crash Description

STRUCK A ROAD SIGN AND AN EMBANKMENT.CRASH EVElrrS

Crash Report

Driver Information 12/19/1955 Age 54

Driver's Action	11. Did Not Have Right-of-Way
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	4. No Apparent Injury
EMS Transport	Yes
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
5	60	60	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	22. Truck - Sport Utility Vehicle (SUV)
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	12. Front
Direction of Travel	West
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 03/14/1981 Age 29

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	8. Deployed - Combination
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	4. No Apparent Injury
EMS Transport	Yes
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	6. Totaled
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	2. Right side - front
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	8. Sign, Traffic Signal
3.	1. Bank Or Ledge
4.	Not Provided
Most Harmful	1. Bank Or Ledge

Cargo Spill: No
Underride: No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Weight over 10,000 lbs	No
Seats 9 or more	No
Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided
Cargo Body Type	Not Provided
GVWR/GCWR	Not Provided
License Class	
Commercial Endorsement	

Hazardous Material

Hazardous Material Placard	
HM 4-Digit	
HM Placard Name	
HM Class	
HM Cargo Present	
HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

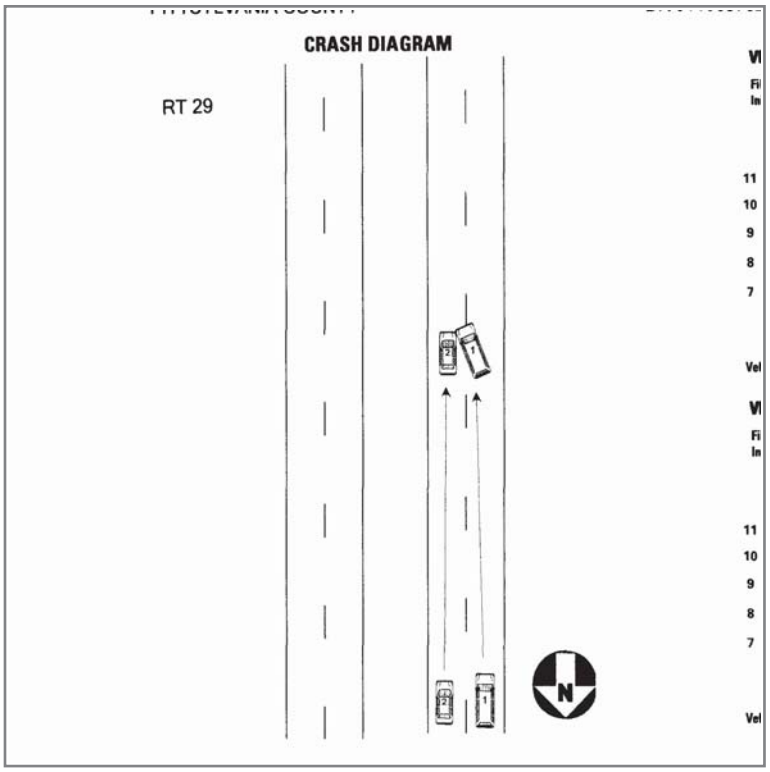
Passenger Information

EMS Transport	Yes
Date of Death	
Position In / On Vehicle	3
Safety Equip Used	3. Lap and Shoulder Belt
Airbag Deployment Type	1. Deployed - Front
Ejected from Vehicle Type	1. Not Ejected
Injury Type	4. No Apparent Injury

Crash Report

Document Number	111050199			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	Pittsylvania County	36.710175	-79.375053
Crash Date	Thursday	01/20/2011	645	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	29 No - At Intersection With or 1.00 Miles South of 863					Mile Marker Number 0.00	Number of Vehicles 2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non-Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	2. Angle

Crash Description

Crash Report

Driver Information 08/13/1934 Age 76

Driver's Action	42. Improper or Unsafe Lane Change
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	14. Changing Lanes
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	3. Van
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	11. Left side - front corner
Direction of Travel	South
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 09/25/1952 Age 58

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	1. Right side - front corner
Direction of Travel	South
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

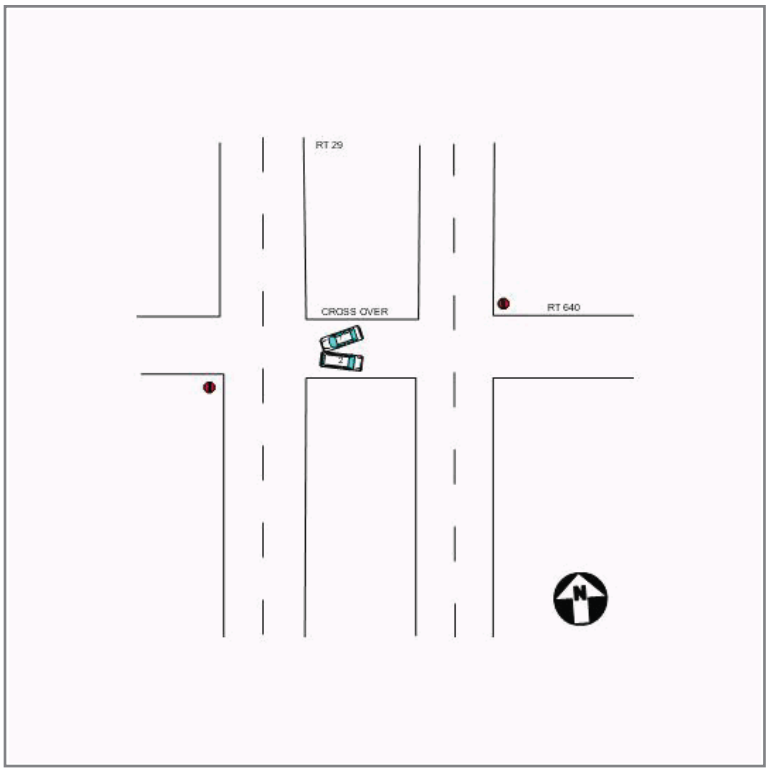
EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	110705093			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	PITTSYLVANIA COUNTY	36.713684	-79.377350
Crash Date	Friday	03/11/2011	1350	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	29						

Mile Marker Number	Number of Vehicles
	2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	12. Crossover Related
Light Condition	2. Daylight	Intersection Type	4. Four Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	2. Angle

Crash Description

VEHICLE 1 TURNING LEFT DID NOT SEE VEHICLE 2 IN CROSSOVER AND STRUCK VEHICLE 2.

Crash Report

Driver Information 05/21/1977 Age 33

Driver's Action	10. Wrong Side Of Road - Not Overtaking
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
10	60	0	3	0	0	0

Vehicle Information 1

Vehicle Maneuver	3. Making Left Turn
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	11. Left side - front corner
Direction of Travel	West
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	Underride
No	No

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 05/17/1961 Age 49

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	5. Slowing or Stopping
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	3. Van
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	7. Left side - rear corner
Direction of Travel	East
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	Underride
No	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count			
			< 8	8-17	18-21	> 21
5	60	0	0	0	0	0

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

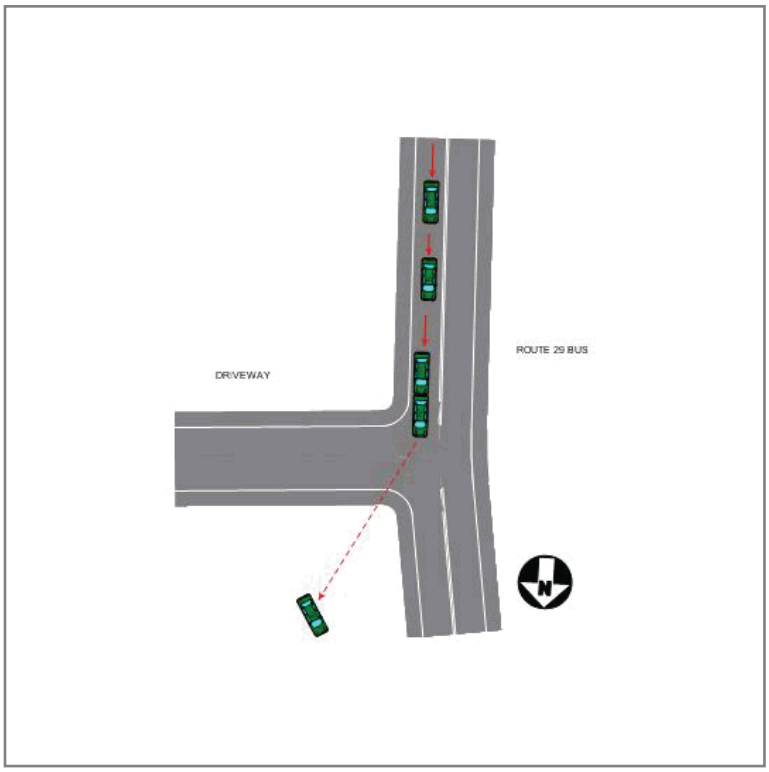
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	111685268		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	PITTSYLVANIA COUNTY		36.704285	-79.370926
Crash Date	Friday	06/17/2011 1600	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	ROUTE SOUTH 29 BUSINESS				Mile Marker Number		Number of Vehicles
	No - At Intersection With or 30.00 Feet North of ROUTE 29						2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	13. Driveway, Alley-Access - Related
Light Condition	2. Daylight	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	2. Curve - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	1. Two-Way, Not Divided	Type of Collision	1. Rear End

Crash Description

VEHICLE # 2 WAS SLOWING TO MAKE A RIGHT TURN INTO A PRIVATE DRIVE WHEN VEHICLE # 1 HIT VEHICLE # 2 IN THE REAR.

Crash Report

Driver Information 01/24/1992 Age 19

Driver's Action	12. Following Too Close
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
50	55	5	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	2. After Application of Brakes
Vehicle Body Type	1. Passenger car
Vehicle Damage	6. Totaled
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	12. Front
Direction of Travel	East
Crash Events: 1.	20. Motor Vehicle In Transport
2.	20. Motor Vehicle In Transport
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill No
Underride No

Weight over 10,000 lbs No
Seats 9 or more No
Hazardous Materials Placard No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided
Cargo Body Type	Not Provided
GVWR/GCWR	Not Provided
License Class	
Commercial Endorsement	

Hazardous Material

Hazardous Material Placard	
HM 4-Digit	
HM Placard Name	
HM Class	
HM Cargo Present	
HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport	
Date of Death	
Position In / On Vehicle	
Safety Equip Used	
Airbag Deployment Type	
Ejected from Vehicle Type	
Injury Type	

Driver Information 05/23/1948 Age 63

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	2. Making Right Turn
Skidding Tire / Mark	2. After Application of Brakes

Crash Report

Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	6. Rear
Direction of Travel	East
Crash Events: 1.	20. Motor Vehicle In Transport
2.	28. Ran Off Road
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	No
Underride	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count			
			< 8	8-17	18-21	> 21
5	55	5	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

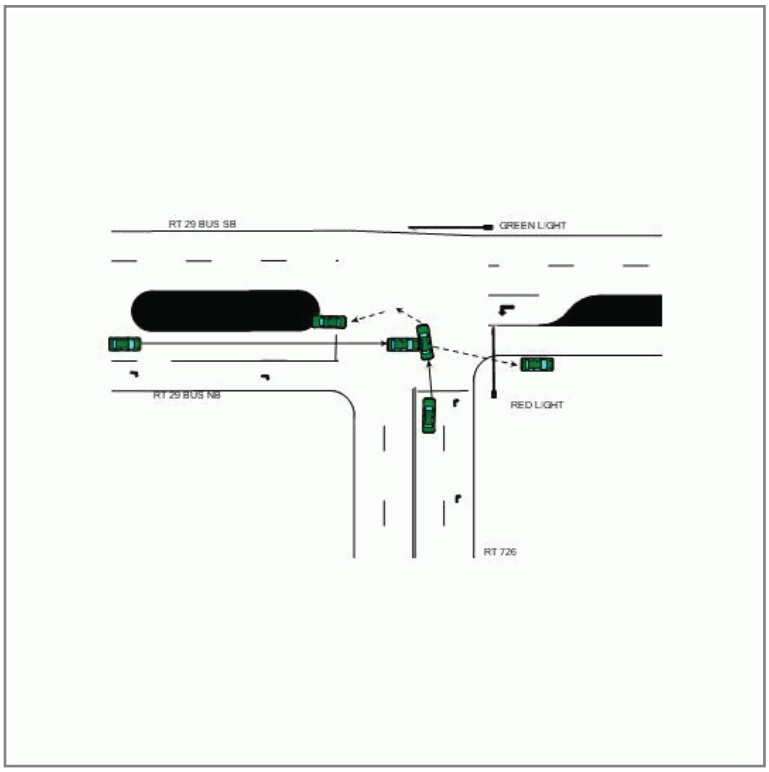
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	111985050			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	PITTSYLVANIA COUNTY	36.697014	-79.366753
Crash Date	Thursday	07/14/2011	850	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	RT 29 BUS			Mile Marker Number		Number of Vehicles	2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	1
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	2. Daylight	Intersection Type	3. Three Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	3. Traffic Signal	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	2. Angle

Crash Description

VEH 1 FAILED TO YEILD TO THE RED LIGHT, STRIKING VEH 2 AS IT CAME INTO THE INTERSECTION

Crash Report

Driver Information 05/31/1965 Age 46

Driver Fled Scene

Driver's Action	21. Disregarded Traffic Signal
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	6. Unknown
Method of Alcohol Determination	Not Applicable
Drug Use	3. Unknown
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	8. No Restraint Used
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
30	45	0	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	2. After Application of Brakes
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	12. Front
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	Underride
No	No

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 06/10/1991 Age 20

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	3. Making Left Turn
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable	Vehicle Body Type	1. Passenger car
Drinking	1. Had Not Been Drinking		
Method of Alcohol Determination	Not Applicable	Vehicle Damage	8. Other
Drug Use	2. No	Vehicle Condition	1. No Defects
Driver's License		Spec. Function Motor Vehicle	1. No Special Function
Commercial Driver's License	NotProvided	EMV in service	Not Applicable
Safety Equipment Used	3. Lap and Shoulder Belt	Truck Cover	Not Applicable
Air Bag	2. Not Deployed	Vehicle Disabled	No
Ejected from Vehicle	1. Not Ejected	Commercial Motor Vehicle	No
Date of Death		Towed	Yes
Injury Type	4. No Apparent Injury	Oversized	No
		Override	No
EMS Transport	Yes	Initial Impact Area	9. Left side - middle
Summons Issued	2. No	Direction of Travel	West
		Crash Events: 1.	20. Motor Vehicle In Transport
		2.	Not Provided
		3.	Not Provided
		4.	Not Provided
		Most Harmful	20. Motor Vehicle In Transport

Cargo Spill: No
Underride: No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
15	45	45	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

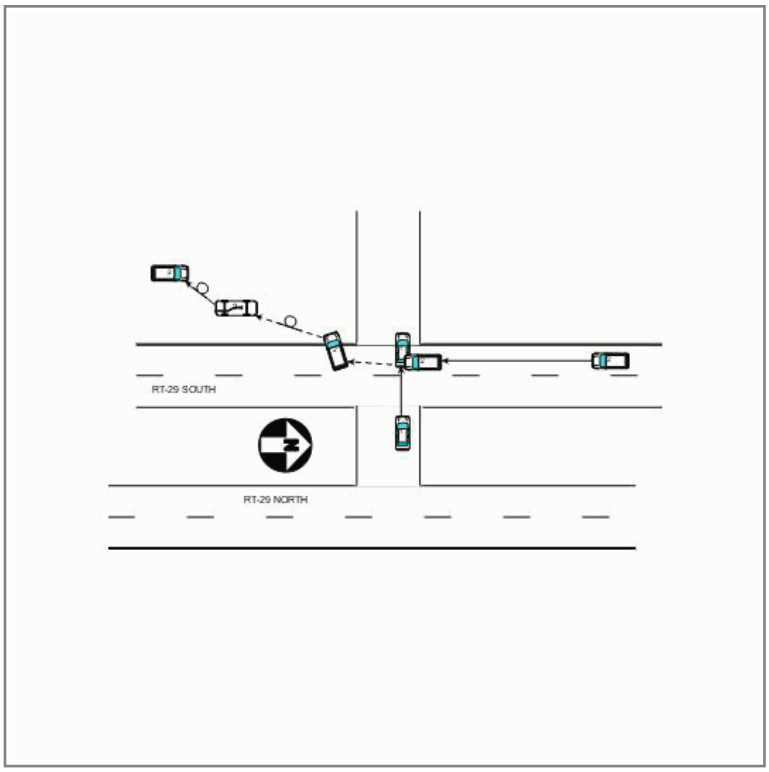
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	112595066		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	PITTSYLVANIA COUNTY		36.711184	-79.375623
Crash Date	Wednesday	09/07/2011 2125	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	RT-29				Mile Marker Number		Number of Vehicles
							2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	2
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	4. Four Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	1. Two-Way, Not Divided	Type of Collision	2. Angle

Crash Description

VEH.#1 PULLED OUT IN FRONT OF VEH.#2. VEH.#2 HIT VEH.#1 CAUSING VEH.#2 TO RUN OFF ROAD FLIPPING VEHICLE SEVERAL TIMES.

Crash Report

Driver Information 04/05/1966 Age 45

Driver's Action	11. Did Not Have Right-of-Way
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	4. No Apparent Injury
EMS Transport	Yes
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
10	0	0	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	6. Totaled
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	4. Right side - rear
Direction of Travel	West
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 02/01/1995 Age 16

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	Not Applicable	Vehicle Body Type	22. Truck - Sport Utility Vehicle (SUV)
Drinking	1. Had Not Been Drinking		
Method of Alcohol Determination	Not Applicable	Vehicle Damage	8. Other
Drug Use	2. No	Vehicle Condition	1. No Defects
Driver's License		Spec. Function Motor Vehicle	1. No Special Function
Commercial Driver's License	NotProvided	EMV in service	Not Applicable
Safety Equipment Used	3. Lap and Shoulder Belt	Truck Cover	Not Applicable
Air Bag	2. Not Deployed	Vehicle Disabled	No
Ejected from Vehicle	1. Not Ejected	Commercial Motor Vehicle	No
Date of Death		Towed	Yes
Injury Type	3. Minor/Possible Injury	Oversized	No
		Override	No
EMS Transport	Yes	Initial Impact Area	12. Front
Summons Issued	2. No	Direction of Travel	South
		Crash Events: 1.	20. Motor Vehicle In Transport
		2.	28. Ran Off Road
		3.	30. Overturn (Rollover)
		4.	Not Provided
		Most Harmful	30. Overturn (Rollover)

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count			
			< 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Cargo Spill	No				
Underride	No				
Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

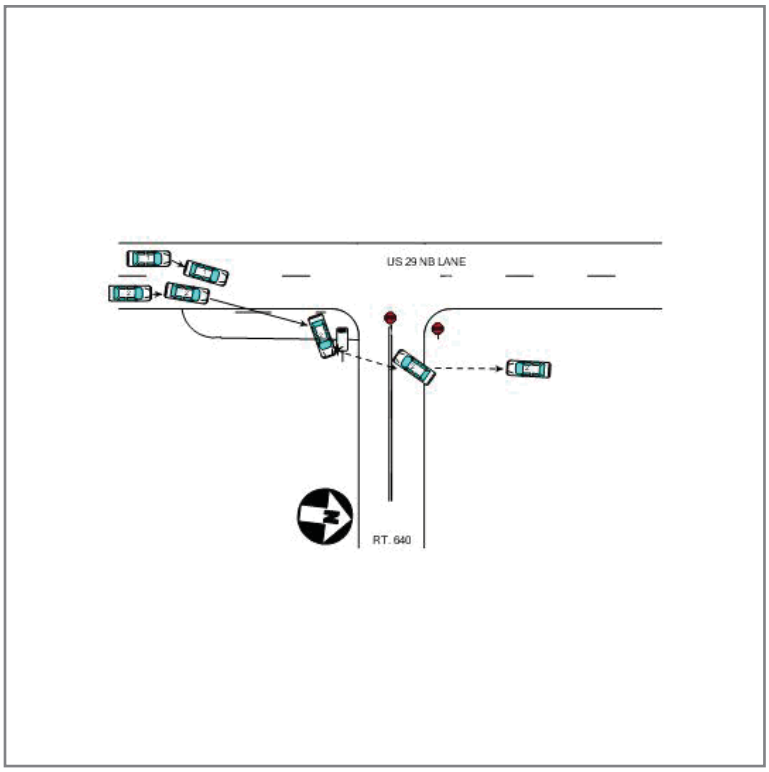
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	112765084		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	Pittsylvania		36.713703	-79.377213
Crash Date	Sunday	10/02/2011 1242	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	RT 29 NB Yes - At Intersection With or 0.00 Not Provided Not Provided of RT 640				Mile Marker Number	0.00	Number of Vehicles 2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	4. Roadside	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	2. Daylight	Intersection Type	4. Four Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	9. Fixed Object - Off Road

Crash Description

VEHICLE 1 WAS TRAVELING IN THE LEFT LANE NORTH BOUND ON ROUTE 29. VEHICLE 2 WAS TRAVELING IN THE RIGHT LANE NEXT TO VEHICLE 1 WHEN VEHICLE 1 CHANGED LANES AND VEHICLE 2 RAN OFF THE ROAD TO THE RIGHT TO AVOID HITTING VEHICLE 1.

Crash Report

Driver Information 07/20/1986 Age 25

Driver's Action	42. Improper or Unsafe Lane Change
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	14. Changing Lanes
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	2. No Damage
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	Not Provided
Direction of Travel	North
Crash Events: 1.	36. Cross Centerline
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	36. Cross Centerline

Cargo Spill	No	Underride	No		
Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 02/25/1952 Age 59

Driver's Action	31. Avoiding Other Vehicle
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	9. Ran Off Road - Right
Skidding Tire / Mark	2. After Application of Brakes

Crash Report

Type of Driver Distractions	Not Applicable
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	10. Left side - front
Direction of Travel	North
Crash Events: 1.	28. Ran Off Road
2.	4. Fence Or Post
3.	Not Provided
4.	Not Provided
Most Harmful	4. Fence Or Post

Cargo Spill: No
Underride: No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

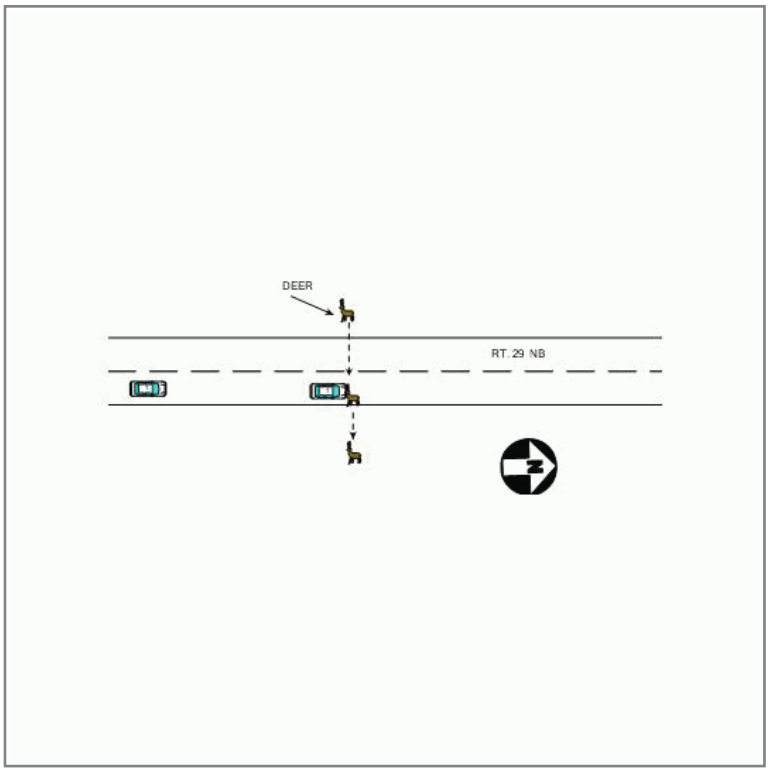
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	121335199			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	PITTSYLVANIA COUNTY	36.700933	-79.366852
Crash Date	Thursday	05/10/2012	2110	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	RT. 29				Mile Marker Number	Number of Vehicles	
	No - At Intersection With or 0.20 Miles North of RT. 726					1	

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non-Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	10. Deer

Crash Description

WHILE TRAVELING NORTHBOUND ON RT. 29, VEHICLE # 1 STRUCK A DEER. THE DEER FLED THE SCENE AND WAS NOT LOCATED.

Crash Report

Driver Information 10/02/1957 Age 54

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	1. Right side - front corner
Direction of Travel	North
Crash Events: 1.	23. Animal
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	23. Animal

Cargo Spill No

Underride No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
65	65	65	0	0	0	0

Weight over 10,000 lbs No

Seats 9 or more No

Hazardous Materials Placard No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

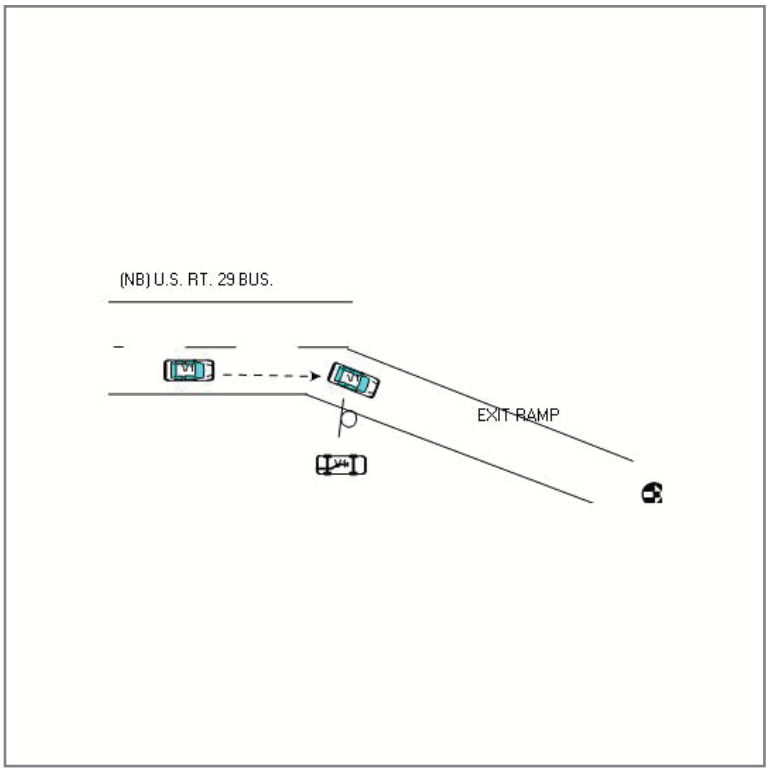
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	122675227		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	PITTSYLVANIA COUNTY		36.699063	-79.367671
Crash Date	Saturday	09/22/2012 40	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	US ROUTE 29 (BUSINESS)				Mile Marker Number		Number of Vehicles
	No - At Intersection With or 0.10 Miles North of SR 726						1

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	2. Shoulder	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	5. On Entrance/Exit Ramp
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	9. One Way Road or Street	Work Zone Workers Present	Not Provided
Roadway Alignment	3. Grade - Straight	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	4. One-Way, Not Divided	Type of Collision	8. Non-Collision

Crash Description

V1 SWERVED THEN OVERCORRECTED CAUSING V1 TO OVERTURN.

Crash Report

Driver Information 08/21/1962 Age 50

Driver's Action	40. Fail to Maintain Proper Control
Condition of Driver Contributing to	6. Fatigued
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	2. Driver Fatigue
Drinking	2. Drinking - Obviously Drunk
Method of Alcohol Determination	2. Breath
Drug Use	3. Unknown
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	1. Yes

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	45	45	0	0	0	0

Vehicle Information 1

Vehicle Maneuver	9. Ran Off Road - Right
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	3. Overturned
Vehicle Condition	Not Applicable
Spec. Function Motor Vehicle	Not Applicable
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	1. Right side - front corner
Direction of Travel	North
Crash Events: 1.	30. Overturn (Rollover)
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	30. Overturn (Rollover)

Weight over 10,000 lbs	Seats 9 or more	Hazardous Materials Placard
No	No	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

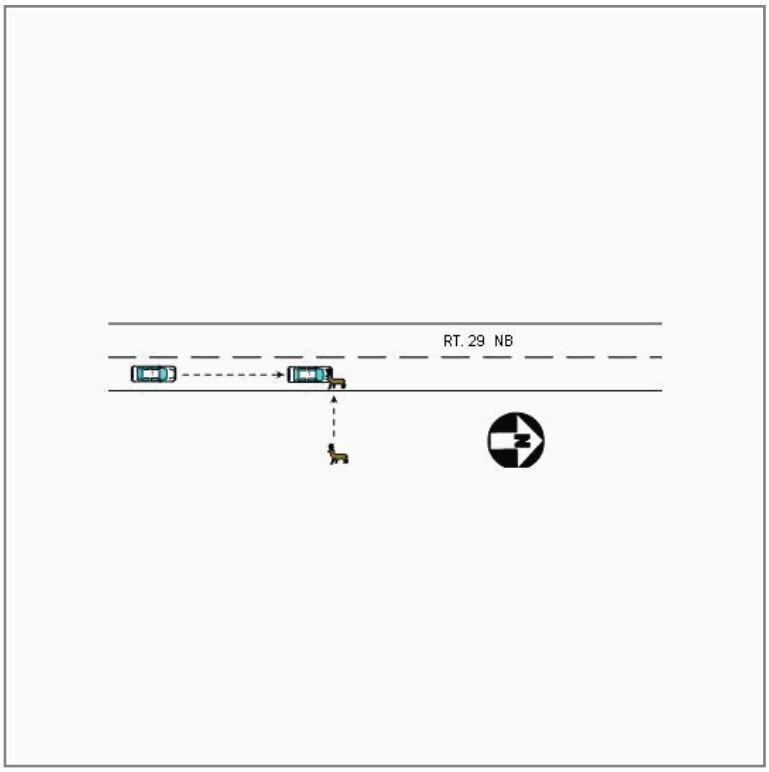
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	122875165			Jurisdiction	Pittsylvania County	GPS Lat.	GPS Long.
Revised Report	0			County of Crash	PITTSYLVANIA COUNTY	36.706983	-79.373010
Crash Date	Friday	10/12/2012	640	Landmarks at Scene			
City / Town of				Railroad Crossing ID			
Location of Crash	RT. 29				Mile Marker Number	Number of Vehicles	
	No - At Intersection With or 0.40 Miles South of RT. 946					1	

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non-Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	4. Stop Sign	Work Zone Workers Present	Not Provided
Roadway Alignment	3. Grade - Straight	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	10. Deer

Crash Description

WHILE TRAVELING NORTHBOUND ON RT. 29, VEHICLE # 1 STRUCK A DEER.

Crash Report

Driver Information 07/13/1990 Age 22

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	Not Applicable
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	1. Right side - front corner
Direction of Travel	North
Crash Events: 1.	23. Animal
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	23. Animal

Cargo Spill No
Underride No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Weight over 10,000 lbs No
Seats 9 or more No
Hazardous Materials Placard No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided
Cargo Body Type	Not Provided
GVWR/GCWR	Not Provided
License Class	
Commercial Endorsement	

Hazardous Material

Hazardous Material Placard	
HM 4-Digit	
HM Placard Name	
HM Class	
HM Cargo Present	
HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

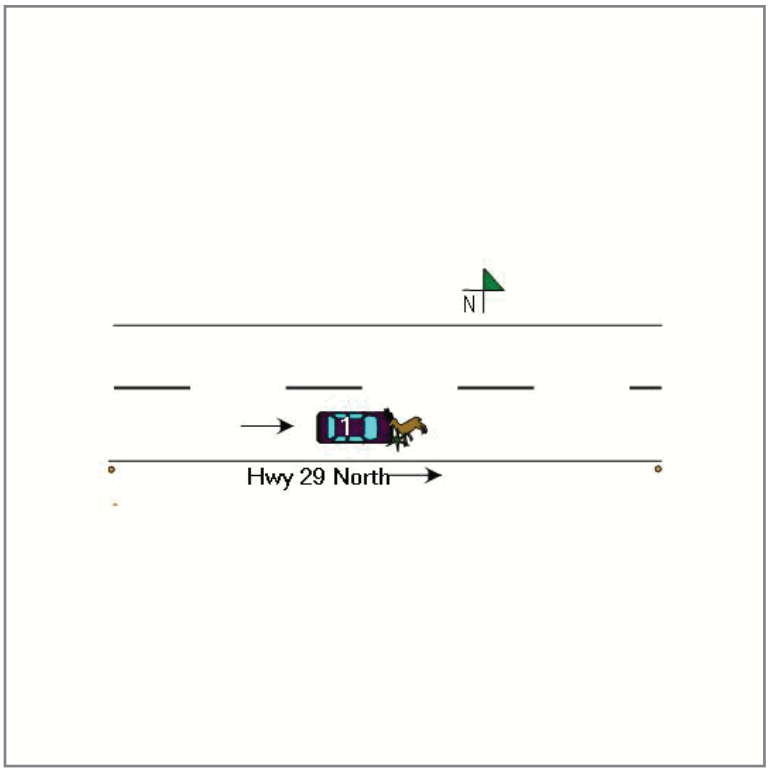
Passenger Information

EMS Transport	
Date of Death	
Position In / On Vehicle	
Safety Equip Used	
Airbag Deployment Type	
Ejected from Vehicle Type	
Injury Type	

Crash Report

Document Number	123135243		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	PITTSYLVANIA COUNTY		36.709513	-79.374513
Crash Date	Thursday	11/08/2012 1905	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	HWY 29				Mile Marker Number		Number of Vehicles
	No - At Intersection With or 0.10 Miles South of ROUTE 946						1

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non-Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	3. Two-Way, Divided, Positive Median Barrier	Type of Collision	10. Deer

Crash Description

VEHICLE # 1 STRUCK A DEER THAT WAS IN THE ROADWAY.

Crash Report

Driver Information 09/06/1951 Age 61

Driver's Action	32. Avoiding Animal
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	4. No Test
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Information 1

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	2. No
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Override	No
Initial Impact Area	12. Front
Direction of Travel	North
Crash Events: 1.	23. Animal
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	23. Animal

Cargo Spill No
Underride No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
60	60	60	0	0	0	0

Weight over 10,000 lbs No
Seats 9 or more No
Hazardous Materials Placard No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided
Cargo Body Type	Not Provided
GVWR/GCWR	Not Provided
License Class	
Commercial Endorsement	

Hazardous Material

Hazardous Material Placard	
HM 4-Digit	
HM Placard Name	
HM Class	
HM Cargo Present	
HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

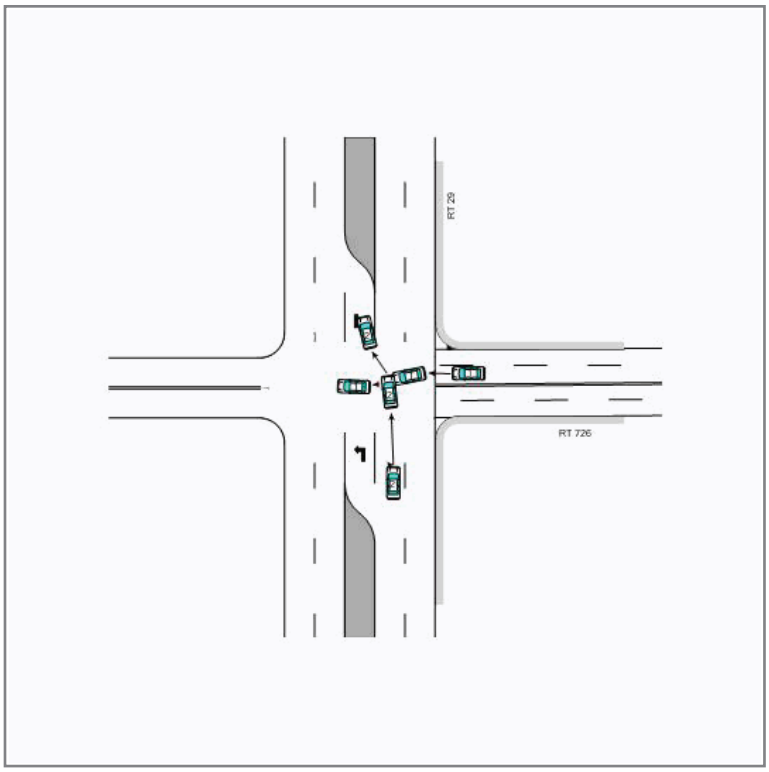
Passenger Information

EMS Transport	
Date of Death	
Position In / On Vehicle	
Safety Equip Used	
Airbag Deployment Type	
Ejected from Vehicle Type	
Injury Type	

Crash Report

Document Number	123305098		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	Pittsylvania		36.697051	-79.366767
Crash Date	Tuesday	11/20/2012 730	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	RT29 BUSINESS				Mile Marker Number		Number of Vehicles
							2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	2. Daylight	Intersection Type	4. Four Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	3. Traffic Signal	Work Zone Workers Present	Not Provided
Roadway Alignment	3. Grade - Straight	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	2. Two-Way, Divided, Unprotected Median	Type of Collision	2. Angle

Crash Description

VEHICLE 1 WAS MAKING A LEFT TURN WHEN VEHICLE 1 AND VEHICLE 2 STRUCK EACH OTHER. UNABLE TO DETERMINE FAULT, CONFLICTING STATEMENTS FROM BOTH DRIVERS.

Crash Report

Driver Information 02/21/1951 Age 61

Driver's Action	11. Did Not Have Right-of-Way
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	4. No Test
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Information 1

Vehicle Maneuver	3. Making Left Turn
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	6. Totaled
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	12. Front
Direction of Travel	West
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
15	45	45	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 08/17/1948 Age 64

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	4. No Test
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	6. Totaled
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	Not Applicable
Vehicle Disabled	Yes
Commercial Motor Vehicle	No
Towed	Yes
Oversized	No
Cargo Spill	No
Override	No
Underride	No
Initial Impact Area	1. Right side - front corner
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
45	45	45	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

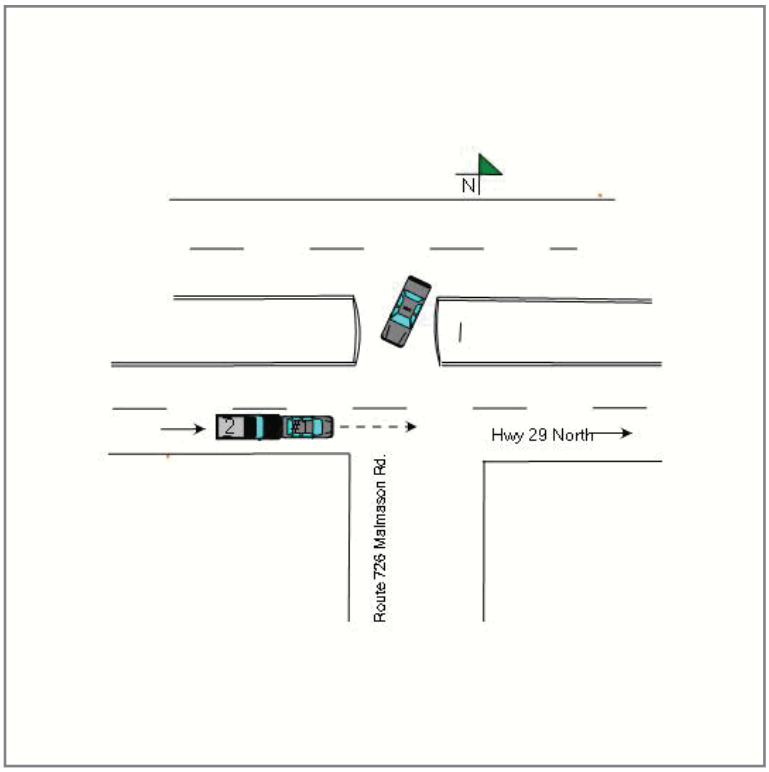
Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Crash Report

Document Number	123555286		Jurisdiction	Pittsylvania County		GPS Lat.	GPS Long.
Revised Report	0		County of Crash	PITTSYLVANIA COUNTY		36.696839	-79.366701
Crash Date	Thursday	12/20/2012 1736	Landmarks at Scene				
City / Town of			Railroad Crossing ID				
Location of Crash	HWY 29 NORTH				Mile Marker Number		Number of Vehicles 2

Crash Image



Fatalities Non-Pedestrian	0
Fatalities Pedestrian	0
Injuries Non-Pedestrian	0
Injuries Pedestrian	0

Crash Information

Location of First Harmful Event	1. On Roadway	Roadway Defects	7. Slick Pavement
Weather Condition	5. Rain	Relation to Roadway	9. Within Intersection
Light Condition	4. Darkness - Road Lighted	Intersection Type	3. Three Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	5. Slow or Warning Sign	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Straight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	2. Wet	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	3. Two-Way, Divided, Positive Median Barrier	Type of Collision	1. Rear End

Crash Description

VEHICLE 1 HAD STOPPED TO YIELD TO POLICE EMERGENCY VEHICLE WHEN IT WAS STRUCK FROM BEHIND BY VEHICLE # 2.

Crash Report

Driver Information 08/04/1942 Age 70

Driver's Action	1. No Improper Action
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured
Type of Driver Distractions	14. No Driver Distraction
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	4. No Test
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Information 1

Vehicle Maneuver	8. Stopped in Traffic Lane
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	2. No
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	6. Rear
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	No
Underride	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count < 8	8-17	18-21	> 21
0	45	0	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information 05/06/1994 Age 18

Driver's Action	12. Following Too Close
Condition of Driver Contributing to	1. No Defects
Driver Vision Obscured	1. Not Obscured

Vehicle Information 2

Vehicle Maneuver	1. Going Straight Ahead
Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark

Crash Report

Type of Driver Distractions	7. Eyes Not on Road
Drinking	1. Had Not Been Drinking
Method of Alcohol Determination	4. No Test
Drug Use	2. No
Driver's License	
Commercial Driver's License	NotProvided
Safety Equipment Used	3. Lap and Shoulder Belt
Air Bag	2. Not Deployed
Ejected from Vehicle	1. Not Ejected
Date of Death	
Injury Type	6. No Injury (driver only)
EMS Transport	No
Summons Issued	2. No

Vehicle Body Type	1. Passenger car
Vehicle Damage	8. Other
Vehicle Condition	1. No Defects
Spec. Function Motor Vehicle	1. No Special Function
EMV in service	Not Applicable
Truck Cover	2. No
Vehicle Disabled	No
Commercial Motor Vehicle	No
Towed	No
Oversized	No
Override	No
Initial Impact Area	12. Front
Direction of Travel	North
Crash Events: 1.	20. Motor Vehicle In Transport
2.	Not Provided
3.	Not Provided
4.	Not Provided
Most Harmful	20. Motor Vehicle In Transport

Cargo Spill	No
Underride	No

Speed Before Crash	Speed Limit	Maximum Safe Speed	ALL Passengers Age Count			
			< 8	8-17	18-21	> 21
45	45	0	0	0	0	0

Weight over 10,000 lbs	No	Seats 9 or more	No	Hazardous Materials Placard	No

Commercial Motor Vehicle Section

Vehicle Configuration	Not Provided		
Cargo Body Type	Not Provided	License Class	
GVWR/GCWR	Not Provided	Commercial Endorsement	

Hazardous Material

Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		HM Cargo Released	

Carrier Identification

Commericial Motor Carrier Name	
US DOT# / State	
Commercial / Non-Commercial	Not Provided

Passenger Information

EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

APPENDIX F

ALTERNATIVES INTERSECTION LEVEL OF SERVICE ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	14	1	2	344	2	31	21	0	969	51	31	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	0		0		50		50		100
Storage Lanes	0		0	2		0		1		1		2
Taper Length (ft)	25			25				125				100
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.97
Frt		0.986			0.858					0.850		
Flt Protected		0.960		0.950				0.950				0.950
Satd. Flow (prot)	0	1559	0	3400	1402	0	0	1805	3112	1299	0	3367
Flt Permitted		0.960		0.950				0.950				0.950
Satd. Flow (perm)	0	1559	0	3400	1402	0	0	1805	3112	1299	0	3367
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			34					109		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	3%	0%	9%	0%	0%	16%	16%	4%	4%
Adj. Flow (vph)	16	1	2	382	2	34	23	0	1077	57	34	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	19	0	382	36	0	0	23	1077	57	0	160
Turn Type	Split	NA		Split	NA		Prot	Prot	NA	pm+ov	Prot	Prot
Protected Phases	4	4		8	8		5	5	2	8	1	1
Permitted Phases										2		
Detector Phase	4	4		8	8		5	5	2	8	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	10.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	16.0	14.0	14.0
Total Split (s)	16.0	16.0		17.0	17.0		14.0	14.0	43.0	17.0	14.0	14.0
Total Split (%)	17.8%	17.8%		18.9%	18.9%		15.6%	15.6%	47.8%	18.9%	15.6%	15.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag		Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	Min	None	None	None
Act Effct Green (s)		10.3		11.4	11.4			8.3	30.1	45.7		8.3
Actuated g/C Ratio		0.14		0.15	0.15			0.11	0.41	0.62		0.11
v/c Ratio		0.09		0.73	0.15			0.11	0.85	0.07		0.42
Control Delay		32.7		42.6	15.3			37.0	28.0	0.3		38.0
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		32.7		42.6	15.3			37.0	28.0	0.3		38.0
LOS		C		D	B			D	C	A		D
Approach Delay		32.7			40.2				26.8			
Approach LOS		C			D				C			
Queue Length 50th (ft)		6		77	1			9	186	0		31

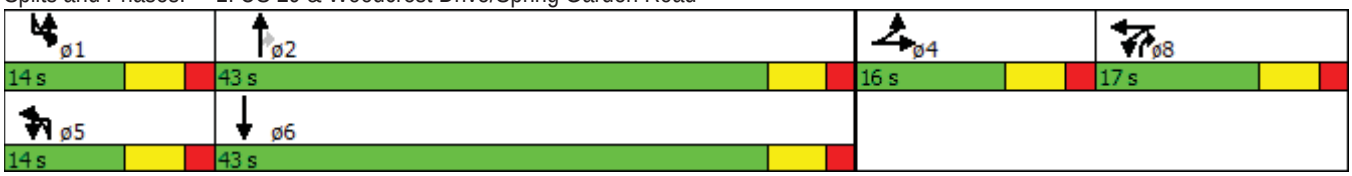
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	1150	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3195	0
Flt Permitted		
Satd. Flow (perm)	3195	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	13%	0%
Adj. Flow (vph)	1278	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1278	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	43.0	
Total Split (%)	47.8%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Recall Mode	Min	
Act Effct Green (s)	40.0	
Actuated g/C Ratio	0.54	
v/c Ratio	0.74	
Control Delay	20.5	
Queue Delay	0.0	
Total Delay	20.5	
LOS	C	
Approach Delay	22.5	
Approach LOS	C	
Queue Length 50th (ft)	133	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		30		#196	29			36	372	1		77
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)								50		50		100
Base Capacity (vph)		221		525	245			202	1617	848		378
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.09		0.73	0.15			0.11	0.67	0.07		0.42

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 73.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.6 Intersection LOS: C
Intersection Capacity Utilization 64.5% 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: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	#521	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	1758	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.73	

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	49	987	161	0	1474
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	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	2	0	11
Mvmt Flow	0	54	1097	179	0	1638

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1916	548	0	0	1097	0
Stage 1	1097	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Critical Hdwy	6.8	6.94	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.32	-	-	2.2	-
Pot Cap-1 Maneuver	61	480	-	-	644	-
Stage 1	286	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	61	480	-	-	644	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	286	-	-	-	-	-
Stage 2	399	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	480	644	-
HCM Lane V/C Ratio	-	-	0.113	-	-
HCM Control Delay (s)	-	-	13.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	15	2	2	634	0	56	67	2	1395	169	15	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	0		0		50		50		100
Storage Lanes	0		0	2		0		1		1		2
Taper Length (ft)	25			25				125				100
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.97
Frt		0.987			0.850					0.850		
Flt Protected		0.961		0.950				0.950				0.950
Satd. Flow (prot)	0	1562	0	3213	1507	0	0	1721	3223	1436	0	3155
Flt Permitted		0.961		0.950				0.950				0.950
Satd. Flow (perm)	0	1562	0	3213	1507	0	0	1721	3223	1436	0	3155
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			224					65		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	5%	0%	12%	5%	11%	11%
Adj. Flow (vph)	17	2	2	704	0	62	74	2	1550	188	17	401
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	704	62	0	0	76	1550	188	0	418
Turn Type	Split	NA		Split	NA		Prot	Prot	NA	pm+ov	Prot	Prot
Protected Phases	4	4		8	8		5	5	2	8	1	1
Permitted Phases										2		
Detector Phase	4	4		8	8		5	5	2	8	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	10.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	16.0	14.0	14.0
Total Split (s)	16.0	16.0		36.0	36.0		19.0	19.0	74.0	36.0	24.0	24.0
Total Split (%)	10.7%	10.7%		24.0%	24.0%		12.7%	12.7%	49.3%	24.0%	16.0%	16.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag		Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	Min	None	None	None
Act Effct Green (s)		10.0		30.1	30.1			11.0	68.2	100.9		18.1
Actuated g/C Ratio		0.07		0.21	0.21			0.08	0.47	0.70		0.13
v/c Ratio		0.19		1.05	0.13			0.58	1.01	0.18		1.06
Control Delay		65.4		101.4	0.5			82.7	63.7	3.6		119.4
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		65.4		101.4	0.5			82.7	63.7	3.6		119.4
LOS		E		F	A			F	E	A		F
Approach Delay		65.4			93.2				58.3			
Approach LOS		E			F				E			
Queue Length 50th (ft)		18		~400	0			73	~874	22		~239

Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	979	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3223	0
Flt Permitted		
Satd. Flow (perm)	3223	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	12%	0%
Adj. Flow (vph)	1088	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1088	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	79.0	
Total Split (%)	52.7%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Recall Mode	Min	
Act Effct Green (s)	75.3	
Actuated g/C Ratio	0.52	
v/c Ratio	0.64	
Control Delay	28.2	
Queue Delay	0.0	
Total Delay	28.2	
LOS	C	
Approach Delay	53.5	
Approach LOS	D	
Queue Length 50th (ft)	420	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		48		#527	0			129	#1013	39		#351
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)								50		50		100
Base Capacity (vph)		111		673	492			156	1531	1028		396
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.19		1.05	0.13			0.49	1.01	0.18		1.06

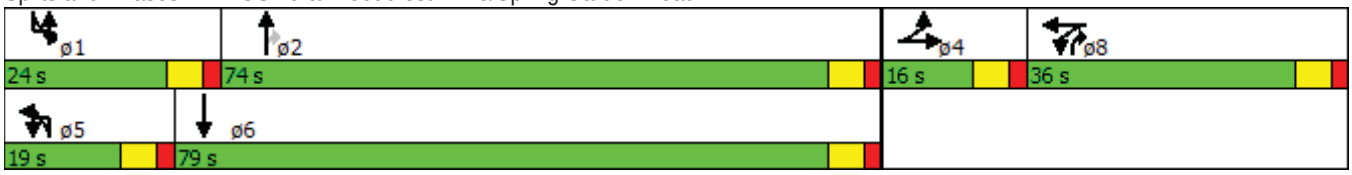
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 143.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 63.1 Intersection LOS: E
Intersection Capacity Utilization 85.4% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	508	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	1689	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.64	

Intersection Summary

Intersection	
Int Delay, s/veh	5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	321	1274	511	0	1606
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	90	90	90	90	90	90
Heavy Vehicles, %	0	2	10	2	0	11
Mvmt Flow	0	357	1416	568	0	1784

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2308	708	0	0	1416	0
Stage 1	1416	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Critical Hdwy	6.8	6.94	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.32	-	-	2.2	-
Pot Cap-1 Maneuver	33	377	-	-	487	-
Stage 1	193	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	33	377	-	-	487	-
Mov Cap-2 Maneuver	33	-	-	-	-	-
Stage 1	193	-	-	-	-	-
Stage 2	366	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	67.3	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	377	487	-
HCM Lane V/C Ratio	-	-	0.946	-	-
HCM Control Delay (s)	-	-	67.3	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	10.4	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	14	1	2	344	2	31	21	0	969	51	31	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	0		0		50		50		100
Storage Lanes	0		0	2		0		1		1		1
Taper Length (ft)	25			25				125				100
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.986			0.858					0.850		
Flt Protected		0.960		0.950				0.950				0.950
Satd. Flow (prot)	0	1559	0	3400	1402	0	0	1805	3112	1299	0	1736
Flt Permitted		0.960		0.950				0.110				0.147
Satd. Flow (perm)	0	1559	0	3400	1402	0	0	209	3112	1299	0	269
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			34					109		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	3%	0%	9%	0%	0%	16%	16%	4%	4%
Adj. Flow (vph)	16	1	2	382	2	34	23	0	1077	57	34	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	19	0	382	36	0	0	23	1077	57	0	85
Turn Type	Split	NA		Split	NA		pm+pt	pm+pt	NA	pm+ov	pm+pt	pm+pt
Protected Phases	4	4		8	8		5	5	2	8	1	1
Permitted Phases							2	2		2	6	6
Detector Phase	4	4		8	8		5	5	2	8	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	10.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	16.0	14.0	14.0
Total Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	44.0	16.0	14.0	14.0
Total Split (%)	17.8%	17.8%		17.8%	17.8%		15.6%	15.6%	48.9%	17.8%	15.6%	15.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag		Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None	Min	None	None	None
Act Effct Green (s)		10.4		10.4	10.4			39.6	33.4	49.7		42.4
Actuated g/C Ratio		0.14		0.14	0.14			0.55	0.46	0.69		0.59
v/c Ratio		0.08		0.78	0.16			0.08	0.75	0.06		0.26
Control Delay		32.9		46.8	15.8			8.1	22.5	0.3		9.4
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		32.9		46.8	15.8			8.1	22.5	0.3		9.4
LOS		C		D	B			A	C	A		A
Approach Delay		32.9			44.1				21.1			
Approach LOS		C			D				C			
Queue Length 50th (ft)		6		75	1			3	181	0		10

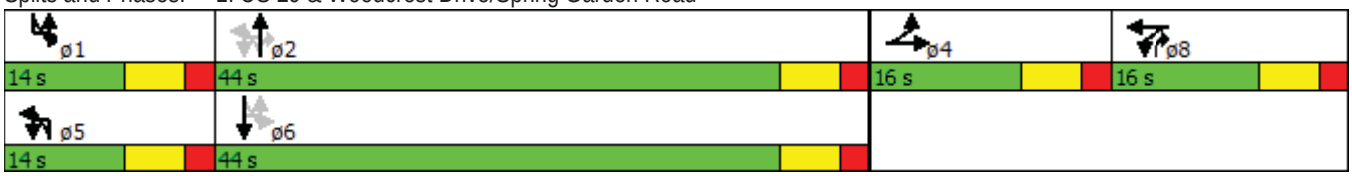
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	1217	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3195	0
Flt Permitted		
Satd. Flow (perm)	3195	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	13%	0%
Adj. Flow (vph)	1352	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1352	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	44.0	
Total Split (%)	48.9%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?		
Recall Mode	Min	
Act Effct Green (s)	39.8	
Actuated g/C Ratio	0.55	
v/c Ratio	0.77	
Control Delay	21.1	
Queue Delay	0.0	
Total Delay	21.1	
LOS	C	
Approach Delay	20.4	
Approach LOS	C	
Queue Length 50th (ft)	137	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		30		#208	29			15	364	1		40
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)								50		50		100
Base Capacity (vph)		226		489	230			298	1701	925		326
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.08		0.78	0.16			0.08	0.63	0.06		0.26

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 72.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 66.3% 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: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	#558	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	1809	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.75	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Volume (vph)	0	49	982	161	5	67	1469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	12
Storage Length (ft)	0	0		0		100	
Storage Lanes	0	1		1		1	
Taper Length (ft)	25					135	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1611	3139	1583	0	1711	3252
Flt Permitted						0.175	
Satd. Flow (perm)	0	1611	3139	1583	0	315	3252
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		276		179			
Link Speed (mph)	15		60				60
Link Distance (ft)	200		2305				1178
Travel Time (s)	9.1		26.2				13.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	15%	2%	2%	2%	11%
Adj. Flow (vph)	0	54	1091	179	6	74	1632
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	54	1091	179	0	80	1632
Turn Type		Perm	NA	Perm	pm+pt	pm+pt	NA
Protected Phases			2		1	1	6
Permitted Phases		8		2	6	6	
Detector Phase		8	2	2	1	1	6
Switch Phase							
Minimum Initial (s)		8.0	17.0	17.0	8.0	8.0	17.0
Minimum Split (s)		14.0	23.0	23.0	14.0	14.0	23.0
Total Split (s)		14.0	32.0	32.0	14.0	14.0	46.0
Total Split (%)		23.3%	53.3%	53.3%	23.3%	23.3%	76.7%
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0		6.0	6.0
Lead/Lag			Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							
Recall Mode		None	Min	Min	None	None	Min
Act Effct Green (s)		8.4	34.1	34.1		38.2	41.4
Actuated g/C Ratio		0.16	0.66	0.66		0.74	0.80
v/c Ratio		0.11	0.53	0.16		0.17	0.63
Control Delay		0.4	12.6	2.6		4.2	6.4
Queue Delay		0.0	0.0	0.0		0.0	0.0
Total Delay		0.4	12.6	2.6		4.2	6.4
LOS		A	B	A		A	A
Approach Delay			11.2				6.3
Approach LOS			B				A
Queue Length 50th (ft)		0	171	0		8	167

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Queue Length 95th (ft)		0	#246	29		19	244
Internal Link Dist (ft)	120		2225				1098
Turn Bay Length (ft)						100	
Base Capacity (vph)		492	2072	1105		458	2597
Starvation Cap Reductn		0	0	0		0	0
Spillback Cap Reductn		0	0	0		0	0
Storage Cap Reductn		0	0	0		0	0
Reduced v/c Ratio		0.11	0.53	0.16		0.17	0.63

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 8.2 Intersection LOS: A
Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: US 29 & The Arc (North Drive)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	12	2	2	634	0	56	67	2	1398	169	15	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	450		0		200		200		200
Storage Lanes	0		0	2		0		1		1		1
Taper Length (ft)	25			300				200				100
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.984			0.850					0.850		
Flt Protected		0.963		0.950				0.950				0.950
Satd. Flow (prot)	0	1560	0	3213	1507	0	0	1721	3223	1436	0	1626
Flt Permitted		0.963		0.950				0.089				0.063
Satd. Flow (perm)	0	1560	0	3213	1507	0	0	161	3223	1436	0	108
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			209					178		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	5%	0%	12%	5%	11%	11%
Adj. Flow (vph)	13	2	2	704	0	62	74	2	1553	188	17	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	704	62	0	0	76	1553	188	0	135
Turn Type	Split	NA		Split	NA		pm+pt	pm+pt	NA	pm+ov	pm+pt	pm+pt
Protected Phases	4	4		8	8		5	5	2	8	1	1
Permitted Phases							2	2		2	6	6
Detector Phase	4	4		8	8		5	5	2	8	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	10.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	16.0	14.0	14.0
Total Split (s)	16.0	16.0		34.0	34.0		14.0	14.0	66.0	34.0	14.0	14.0
Total Split (%)	12.3%	12.3%		26.2%	26.2%		10.8%	10.8%	50.8%	26.2%	10.8%	10.8%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag		Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	Min	None	None	None
Act Effct Green (s)		10.0		28.1	28.1			68.3	60.2	92.2		69.5
Actuated g/C Ratio		0.08		0.23	0.23			0.57	0.50	0.77		0.58
v/c Ratio		0.13		0.94	0.12			0.39	0.96	0.16		0.83
Control Delay		52.3		66.9	0.5			17.1	45.3	0.9		64.0
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		52.3		66.9	0.5			17.1	45.3	0.9		64.0
LOS		D		E	A			B	D	A		E
Approach Delay		52.3			61.5				39.5			
Approach LOS		D			E				D			
Queue Length 50th (ft)		10		258	0			19	526	1		53

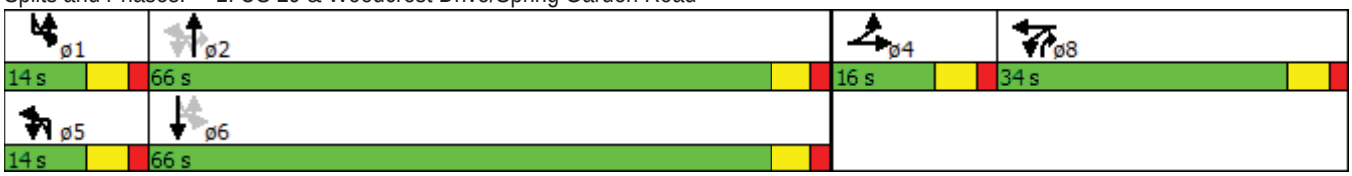
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	1234	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3223	0
Flt Permitted		
Satd. Flow (perm)	3223	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	12%	0%
Adj. Flow (vph)	1371	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1371	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	66.0	
Total Split (%)	50.8%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Recall Mode	Min	
Act Effct Green (s)	63.2	
Actuated g/C Ratio	0.52	
v/c Ratio	0.81	
Control Delay	30.7	
Queue Delay	0.0	
Total Delay	30.7	
LOS	C	
Approach Delay	33.7	
Approach LOS	C	
Queue Length 50th (ft)	418	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		38		#446	0			51	#885	12		#197
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)				450				200		200		200
Base Capacity (vph)		131		750	511			195	1612	1141		163
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.13		0.94	0.12			0.39	0.96	0.16		0.83

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 120.4
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 41.5 Intersection LOS: D
Intersection Capacity Utilization 82.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	#717	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	1692	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.81	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	321	1274	511	255	1606
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12
Storage Length (ft)	0	0		0	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				135	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1611	3282	1583	1711	3252
Flt Permitted					0.109	
Satd. Flow (perm)	0	1611	3282	1583	196	3252
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		239		568		
Link Speed (mph)	15		60			60
Link Distance (ft)	200		2305			1178
Travel Time (s)	9.1		26.2			13.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	10%	2%	2%	11%
Adj. Flow (vph)	0	357	1416	568	283	1784
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	357	1416	568	283	1784
Turn Type		Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases		8		2	6	
Detector Phase		8	2	2	1	6
Switch Phase						
Minimum Initial (s)		8.0	17.0	17.0	8.0	17.0
Minimum Split (s)		14.0	23.0	23.0	14.0	23.0
Total Split (s)		14.0	37.0	37.0	14.0	51.0
Total Split (%)		21.5%	56.9%	56.9%	21.5%	78.5%
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode		None	Min	Min	None	Min
Act Effct Green (s)		8.0	30.8	30.8	44.8	44.8
Actuated g/C Ratio		0.12	0.48	0.48	0.69	0.69
v/c Ratio		0.88	0.91	0.54	0.88	0.79
Control Delay		35.2	26.4	3.2	43.0	10.3
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		35.2	26.4	3.2	43.0	10.3
LOS		D	C	A	D	B
Approach Delay			19.7			14.8
Approach LOS			B			B
Queue Length 50th (ft)		45	255	0	60	202

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 95th (ft)		#184	#404	46	#189	292
Internal Link Dist (ft)	120		2225			1098
Turn Bay Length (ft)					100	
Base Capacity (vph)		408	1571	1054	322	2259
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.88	0.90	0.54	0.88	0.79

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 64.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 18.7 Intersection LOS: B
Intersection Capacity Utilization 65.1% 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: 3: US 29 & The Arc (North Drive)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	14	1	2	246	2	31	21	0	969	51	31	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	0		0		50		50		100
Storage Lanes	0		0	1		0		1		1		1
Taper Length (ft)	25			25				125				100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.986			0.858					0.850		
Flt Protected		0.960		0.950				0.950				0.950
Satd. Flow (prot)	0	1559	0	1752	1402	0	0	1805	3112	1299	0	1736
Flt Permitted		0.825		0.745				0.131				0.182
Satd. Flow (perm)	0	1339	0	1374	1402	0	0	249	3112	1299	0	332
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			34					89		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	3%	0%	9%	0%	0%	16%	16%	4%	4%
Adj. Flow (vph)	16	1	2	273	2	34	23	0	1077	57	34	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	19	0	273	36	0	0	23	1077	57	0	85
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8			2	2		2	6	6
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	17.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	23.0	14.0	14.0
Total Split (s)	34.0	34.0		34.0	34.0		14.0	14.0	62.0	62.0	14.0	14.0
Total Split (%)	30.9%	30.9%		30.9%	30.9%		12.7%	12.7%	56.4%	56.4%	12.7%	12.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None	C-Min	C-Min	None	None
Act Effct Green (s)		25.2		25.2	25.2			68.0	61.6	61.6		70.4
Actuated g/C Ratio		0.23		0.23	0.23			0.62	0.56	0.56		0.64
v/c Ratio		0.06		0.87	0.10			0.09	0.62	0.07		0.27
Control Delay		29.6		67.4	12.0			6.8	12.4	0.5		9.7
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		29.6		67.4	12.0			6.8	12.4	0.5		9.7
LOS		C		E	B			A	B	A		A
Approach Delay		29.6			60.9				11.7			
Approach LOS		C			E				B			
Queue Length 50th (ft)		9		181	1			5	121	0		21

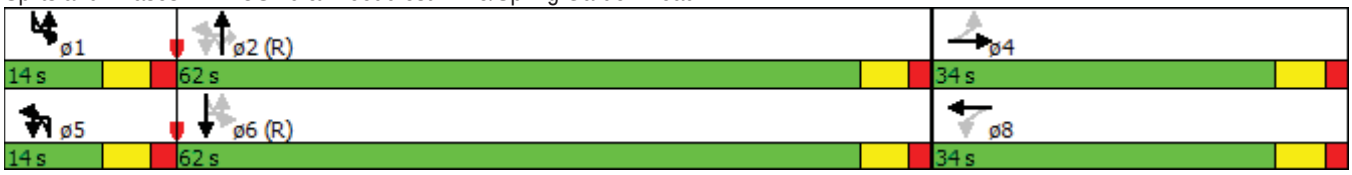
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	1217	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3195	0
Flt Permitted		
Satd. Flow (perm)	3195	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	13%	0%
Adj. Flow (vph)	1352	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1352	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	62.0	
Total Split (%)	56.4%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?		
Recall Mode	C-Min	
Act Effct Green (s)	67.2	
Actuated g/C Ratio	0.61	
v/c Ratio	0.69	
Control Delay	19.0	
Queue Delay	0.0	
Total Delay	19.0	
LOS	B	
Approach Delay	18.5	
Approach LOS	B	
Queue Length 50th (ft)	289	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		29		#310	27			m9	136	m3		40
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)								50		50		100
Base Capacity (vph)		342		349	382			267	1743	767		314
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.06		0.78	0.09			0.09	0.62	0.07		0.27

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 80 (73%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 70.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	514	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	1952	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.69	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Volume (vph)	98	49	982	161	5	67	1371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	12
Storage Length (ft)	0	0		0		100	
Storage Lanes	2	1		1		2	
Taper Length (ft)	25					135	
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	0.97	0.95
Frt		0.850		0.850			
Flt Protected	0.950					0.950	
Satd. Flow (prot)	3433	1583	3139	1583	0	3323	3252
Flt Permitted	0.950					0.950	
Satd. Flow (perm)	3433	1583	3139	1583	0	3323	3252
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		54		179			
Link Speed (mph)	15		60				60
Link Distance (ft)	200		2305				1178
Travel Time (s)	9.1		26.2				13.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	15%	2%	0%	2%	11%
Adj. Flow (vph)	109	54	1091	179	6	74	1523
Shared Lane Traffic (%)							
Lane Group Flow (vph)	109	54	1091	179	0	80	1523
Turn Type	Prot	Perm	NA	pm+ov	Prot	Prot	NA
Protected Phases	3		2	3	1	1	6
Permitted Phases		3		2			
Detector Phase	3	3	2	3	1	1	6
Switch Phase							
Minimum Initial (s)	10.0	10.0	17.0	10.0	8.0	8.0	17.0
Minimum Split (s)	16.0	16.0	23.0	16.0	14.0	14.0	23.0
Total Split (s)	18.0	18.0	76.0	18.0	16.0	16.0	92.0
Total Split (%)	16.4%	16.4%	69.1%	16.4%	14.5%	14.5%	83.6%
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?							
Recall Mode	None	None	C-Min	None	None	None	C-Min
Act Effct Green (s)	10.3	10.3	75.9	93.4		8.6	87.7
Actuated g/C Ratio	0.09	0.09	0.69	0.85		0.08	0.80
v/c Ratio	0.34	0.27	0.50	0.13		0.31	0.59
Control Delay	49.7	16.4	9.9	0.6		42.0	3.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	49.7	16.4	9.9	0.6		42.0	3.7
LOS	D	B	A	A		D	A
Approach Delay	38.7		8.5				5.6
Approach LOS	D		A				A
Queue Length 50th (ft)	37	0	183	0		28	78

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Queue Length 95th (ft)	65	38	258	12		m36	140
Internal Link Dist (ft)	120		2225				1098
Turn Bay Length (ft)						100	
Base Capacity (vph)	374	220	2166	1316		303	2593
Starvation Cap Reductn	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0
Reduced v/c Ratio	0.29	0.25	0.50	0.14		0.26	0.59

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 96 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 56.2% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: US 29 & The Arc (North Drive)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	12	2	2	88	0	56	67	2	1398	169	15	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	8	12	12	10	12	12	12	12	10	12	12
Storage Length (ft)	0		0	0		0		50		50		100
Storage Lanes	0		0	1		0		1		1		1
Taper Length (ft)	25			25				125				100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.984			0.850					0.850		
Flt Protected		0.963		0.950				0.950				0.950
Satd. Flow (prot)	0	1560	0	1656	1507	0	0	1721	3223	1436	0	1626
Flt Permitted		0.744		0.746				0.151				0.100
Satd. Flow (perm)	0	1206	0	1300	1507	0	0	274	3223	1436	0	171
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		2			139					98		
Link Speed (mph)		25			55				60			
Link Distance (ft)		677			1406				798			
Travel Time (s)		18.5			17.4				9.1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	5%	0%	12%	5%	11%	11%
Adj. Flow (vph)	13	2	2	98	0	62	74	2	1553	188	17	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	98	62	0	0	76	1553	188	0	135
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8			2	2		2	6	6
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0	17.0	17.0	8.0	8.0
Minimum Split (s)	16.0	16.0		16.0	16.0		14.0	14.0	23.0	23.0	14.0	14.0
Total Split (s)	19.0	19.0		19.0	19.0		14.0	14.0	67.0	67.0	14.0	14.0
Total Split (%)	19.0%	19.0%		19.0%	19.0%		14.0%	14.0%	67.0%	67.0%	14.0%	14.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0			6.0	6.0	6.0		6.0
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None	C-Min	C-Min	None	None
Act Effct Green (s)		11.9		11.9	11.9			73.2	65.2	65.2		74.6
Actuated g/C Ratio		0.12		0.12	0.12			0.73	0.65	0.65		0.75
v/c Ratio		0.12		0.64	0.21			0.24	0.74	0.19		0.55
Control Delay		37.5		60.7	1.5			2.1	4.9	0.7		18.3
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay		37.5		60.7	1.5			2.1	4.9	0.7		18.3
LOS		D		E	A			A	A	A		B
Approach Delay		37.5			37.8				4.4			
Approach LOS		D			D				A			
Queue Length 50th (ft)		9		60	0			5	108	2		19

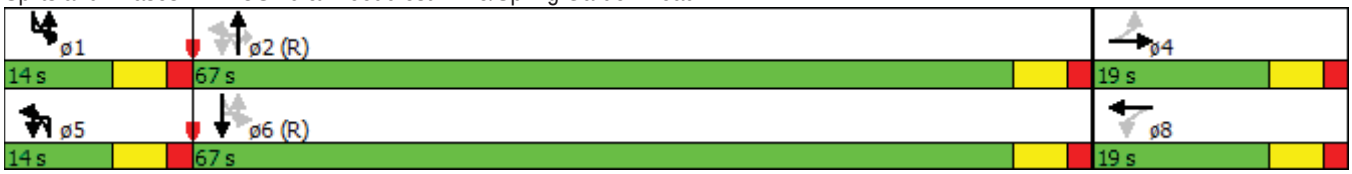
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	1234	0
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	12
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt		
Flt Protected		
Satd. Flow (prot)	3223	0
Flt Permitted		
Satd. Flow (perm)	3223	0
Right Turn on Red		Yes
Satd. Flow (RTOR)		
Link Speed (mph)	60	
Link Distance (ft)	1325	
Travel Time (s)	15.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	12%	0%
Adj. Flow (vph)	1371	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1371	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	17.0	
Minimum Split (s)	23.0	
Total Split (s)	67.0	
Total Split (%)	67.0%	
Yellow Time (s)	4.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	6.0	
Lead/Lag	Lag	
Lead-Lag Optimize?		
Recall Mode	C-Min	
Act Effct Green (s)	69.3	
Actuated g/C Ratio	0.69	
v/c Ratio	0.61	
Control Delay	12.7	
Queue Delay	0.0	
Total Delay	12.7	
LOS	B	
Approach Delay	13.2	
Approach LOS	B	
Queue Length 50th (ft)	286	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)		29		#122	0			m1	93	m4		72
Internal Link Dist (ft)		597			1326				718			
Turn Bay Length (ft)								50		50		100
Base Capacity (vph)		158		169	316			316	2104	971		245
Starvation Cap Reductn		0		0	0			0	0	0		0
Spillback Cap Reductn		0		0	0			0	0	0		0
Storage Cap Reductn		0		0	0			0	0	0		0
Reduced v/c Ratio		0.11		0.58	0.20			0.24	0.74	0.19		0.55

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 99 (99%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 9.9 Intersection LOS: A
Intersection Capacity Utilization 68.7% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: US 29 & Woodcrest Drive/Spring Garden Road



Lane Group	SBT	SBR
Queue Length 95th (ft)	365	
Internal Link Dist (ft)	1245	
Turn Bay Length (ft)		
Base Capacity (vph)	2233	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.61	

Intersection Summary

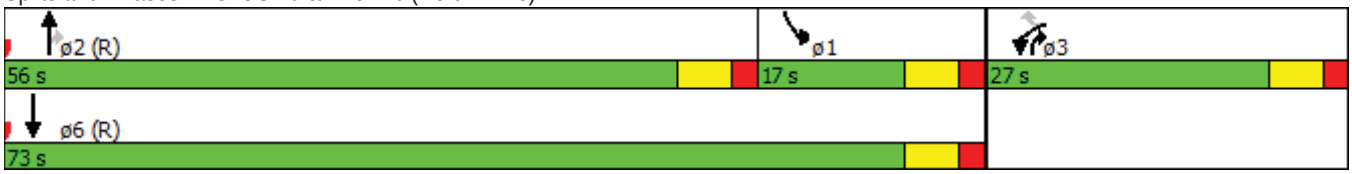
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	546	321	1274	511	255	1060
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12
Storage Length (ft)	0	0		0	100	
Storage Lanes	2	1		1	2	
Taper Length (ft)	25				135	
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3282	1583	3319	3252
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3282	1583	3319	3252
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		216		34		
Link Speed (mph)	15		60			60
Link Distance (ft)	200		2305			1178
Travel Time (s)	9.1		26.2			13.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	10%	2%	2%	11%
Adj. Flow (vph)	607	357	1416	568	283	1178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	607	357	1416	568	283	1178
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	3		2	3	1	6
Permitted Phases		3		2		
Detector Phase	3	3	2	3	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	17.0	10.0	8.0	17.0
Minimum Split (s)	16.0	16.0	23.0	16.0	14.0	23.0
Total Split (s)	27.0	27.0	56.0	27.0	17.0	73.0
Total Split (%)	27.0%	27.0%	56.0%	27.0%	17.0%	73.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	20.8	20.8	50.0	76.8	11.2	67.2
Actuated g/C Ratio	0.21	0.21	0.50	0.77	0.11	0.67
v/c Ratio	0.85	0.71	0.86	0.46	0.76	0.54
Control Delay	50.9	23.1	28.9	5.3	50.7	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	23.1	28.9	5.3	50.7	10.1
LOS	D	C	C	A	D	B
Approach Delay	40.6		22.2			17.9
Approach LOS	D		C			B
Queue Length 50th (ft)	192	81	401	97	87	132

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 95th (ft)	#278	187	507	148	#147	244
Internal Link Dist (ft)	120		2225			1098
Turn Bay Length (ft)					100	
Base Capacity (vph)	723	504	1655	1209	375	2187
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.71	0.86	0.47	0.75	0.54

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 84 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 24.8 Intersection LOS: C
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: US 29 & The Arc (North Drive)



APPENDIX G

ALTERNATIVES PRELIMINARY ESTIMATES OF PROBABLE COST

BLAIRS FIRE STATION - PLANNING LEVEL STUDY

ALTERNATIVE 1 - RIGHT IN/RIGHT OUT

PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Rte 29 & Woodcrest Dr/Spring Garden Rd Intersection				
INSTALL LEFT TURN LANE - SOUTHBOUND	750	LF	$ 335.00	$ 83,750.00
EXTEND LEFT TURN LANE - SOUTHBOUND	500	LF	$ 335.00	$ 83,750.00
WIDEN APPROACHES (WOODCREST DR)	822	LF	$ 335.00	$ 275,370.00
INSTALL LEFT TURN LANE - NORTHBOUND	400	LF	$ 335.00	$ 134,000.00
EXTEND RIGHT TURN LANE - NORTHBOUND	400	LF	$ 335.00	$ 134,000.00
INSTALL LEFT TURN LANE - WESTBOUND	750	LF	$ 335.00	$ 251,250.00
INSTALL LEFT TURN LANE - WESTBOUND	950	LF	$ 335.00	$ 318,250.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & Georges Ln Intersection				
DEMO EXISTING CROSSOVER AND TURN LANES	403	SY	$ 20.00	$ 8,060.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & The Arc (North)				
DEMO EXISTING CROSSOVER AND TURN LANES	340	SY	$ 20.00	$ 6,800.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
INSTALL RIGHT TURN LANE - NORTHBOUND	650	LF	$ 335.00	$ 83,750.00
ENTRANCE IMPROVEMENTS (2-12' LANES)	643	LF	$ 400.00	$ 257,200.00
Rte 29 & The Arc (South)				
DEMO EXISTING CROSSOVER AND TURN LANES	598	SY	$ 20.00	$ 11,960.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & Blairs Fire Station Entrance				
DEMO EXISTING CROSSOVER AND TURN LANES	215	SY	$ 20.00	$ 4,300.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Frontage Road				
FRONTAGE ROAD	3726	LF	$ 400.00	$ 1,490,400.00
STORMWATER MANAGEMENT - BASINS	2	EA	$ 27,500.00	$ 55,000.00
			SUB TOTAL	**$ 3,407,840.00**
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	$ 851,960.00
			15% FOR ENGINEERING	$ 511,176.00
			18% FOR CONSTRUCTION INSPECTION	$ 613,411.20
			TOTAL	**$ 5,384,387.20**

BLAIRS FIRE STATION - PLANNING LEVEL STUDY

ALTERNATIVE 2 - LEFT OVERS

PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Rte 29 & Woodcrest Dr/Spring Garden Rd Intersection				
EXTEND LEFT TURN LANE - SOUTHBOUND	350	LF	$ 335.00	$ 83,750.00
WIDEN APPROACHES (WOODCREST DR)	822	LF	$ 335.00	$ 275,370.00
INSTALL LEFT TURN LANE - NORTHBOUND	400	LF	$ 335.00	$ 134,000.00
EXTEND RIGHT TURN LANE - NORTHBOUND	400	LF	$ 335.00	$ 134,000.00
INSTALL LEFT TURN LANE - WESTBOUND	650	LF	$ 335.00	$ 217,750.00
INSTALL LEFT TURN LANE - WESTBOUND	850	LF	$ 335.00	$ 284,750.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & Georges Ln Intersection				
DEMO EXISTING CROSSOVER AND TURN LANES	403	SY	$ 20.00	$ 8,060.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & The Arc (North)				
INSTALL LEFT TURN LANE - SOUTHBOUND	550	LF	$ 335.00	$ 184,250.00
INSTALL LEFT TURN LANE - NORTHBOUND	550	LF	$ 335.00	$ 184,250.00
MEDIAN STRIP	100	SY	$ 52.00	$ 5,200.00
DEMO EXISTING CROSSOVER AND TURN LANES	503	SY	$ 20.00	$ 10,060.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
INSTALL RIGHT TURN LANE - NORTHBOUND	550	LF	$ 335.00	$ 83,750.00
ENTRANCE IMPROVEMENTS (2-12' LANES)	436	LF	$ 400.00	$ 174,400.00
INSTALL SIGNAL AHEAD WARNING W/ FLASHING BEACONS	3	EA	$ 25,000.00	$ 75,000.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & The Arc (South)				
DEMO EXISTING CROSSOVER AND TURN LANES	598	SY	$ 20.00	$ 11,960.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & Blairs Fire Station Entrance				
DEMO EXISTING CROSSOVER AND TURN LANES	215	SY	$ 20.00	$ 4,300.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Frontage Road				
FRONTAGE ROAD	3726	LF	$ 400.00	$ 1,490,400.00
STORMWATER MANAGEMENT - BASINS	2	EA	$ 27,500.00	$ 55,000.00
			SUB TOTAL	**$ 3,826,250.00**
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	$ 956,562.50
			15% FOR ENGINEERING	$ 573,937.50
			18% FOR CONSTRUCTION INSPECTION	$ 688,725.00
			TOTAL	**$ 6,045,475.00**

BLAIRS FIRE STATION - PLANNING LEVEL STUDY

ALTERNATIVE 3 - FULL ACCESS

PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Rte 29 & Woodcrest Dr/Spring Garden Rd Intersection				
EXTEND LEFT TURN LANE - SOUTHBOUND	350	LF	$ 335.00	$ 83,750.00
WIDEN APPROACHES (WOODCREST DR)	822	LF	$ 335.00	$ 275,370.00
INSTALL LEFT TURN LANE - NORTHBOUND	400	LF	$ 335.00	$ 134,000.00
EXTEND RIGHT TURN LANE - NORTHBOUND	450	LF	$ 335.00	$ 150,750.00
INSTALL LEFT TURN LANE - WESTBOUND	500	LF	$ 335.00	$ 167,500.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & Georges Ln Intersection				
DEMO EXISTING CROSSOVER AND TURN LANES	403	SY	$ 20.00	$ 8,060.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & The Arc (North)				
INSTALL LEFT TURN LANE - SOUTHBOUND	550	LF	$ 335.00	$ 184,250.00
EXTEND LEFT TURN LANE - SOUTHBOUND	300	LF	$ 335.00	$ 100,500.00
INSTALL LEFT TURN LANE - NORTHBOUND	410	LF	$ 335.00	$ 137,350.00
INSTALL RIGHT TURN LANE - NORTHBOUND	350	LF	$ 335.00	$ 117,250.00
ENTRANCE IMPROVEMENTS (4-12' LANES)	673	LF	$ 800.00	$ 538,400.00
INSTALL RIGHT TURN LANE - WESTBOUND	400	LF	$ 335.00	$ 134,000.00
INSTALL SIGNAL AHEAD WARNING W/ FLASHING BEACONS	3	EA	$ 25,000.00	$ 75,000.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & The Arc (South)				
DEMO EXISTING CROSSOVER AND TURN LANES	598	SY	$ 20.00	$ 11,960.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Rte 29 & Blairs Fire Station Entrance				
DEMO EXISTING CROSSOVER AND TURN LANES	215	SY	$ 20.00	$ 4,300.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Frontage Road				
FRONTAGE ROAD	3726	LF	$ 400.00	$ 1,490,400.00
STORMWATER MANAGEMENT - BASINS	2	EA	$ 27,500.00	$ 55,000.00
			SUB TOTAL	**$ 4,075,340.00**
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	$ 1,018,835.00
			15% FOR ENGINEERING	$ 611,301.00
			18% FOR CONSTRUCTION INSPECTION	$ 733,561.20
			TOTAL	**$ 6,439,037.20**

SHORT TERM IMPROVEMENTS - ACCESS AT THE ARC (NORTH) TO THE BLAIRS FIRE STATION

PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Rte 29 & The Arc (South)				
DEMO EXISTING CROSSOVER AND TURN LANES	598	SY	$ 20.00	$ 11,960.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
INSTALL SIGNAL AHEAD WARNING W/ FLASHING BEACONS	3	EA	$ 25,000.00	$ 75,000.00
INSTALL TRAFFIC SIGNAL	1	EA	$ 200,000.00	$ 200,000.00
Rte 29 & Blairs Fire Station Entrance				
DEMO EXISTING CROSSOVER AND TURN LANES	215	SY	$ 20.00	$ 4,300.00
RESTRIPE PAVEMENT	1	EA	$ 2,500.00	$ 2,500.00
Frontage Road				
FRONTAGE ROAD	1710	LF	$ 400.00	$ 684,000.00
STORMWATER MANAGEMENT - BASINS	1	EA	$ 27,500.00	$ 27,500.00
			SUB TOTAL	**$ 1,007,760.00**
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	$ 251,940.00
			15% FOR ENGINEERING	$ 151,164.00
			18% FOR CONSTRUCTION INSPECTION	$ 181,396.80
			TOTAL	**$ 1,592,260.80**

BLAIRS FIRE STATION RELOCATION

PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
FIRE STATION	20000	SF	$ 150.00	$ 3,000,000.00
LAND ACQUISITION	2	AC	$ 250,000.00	$ 500,000.00
SITE IMPROVEMENTS	1	EA	$ 500,000.00	$ 500,000.00
			SUB TOTAL	**$ 4,000,000.00**
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	$ 1,000,000.00
			15% FOR ENGINEERING	$ 600,000.00
			18% FOR CONSTRUCTION INSPECTION	$ 720,000.00
			TOTAL	**$ 6,320,000.00**

APPENDIX H

EVALUATION CRITERIA SCORES

APPENDIX H

EVALUATION CRITERIA SCORES

Blairs Fire Station - Evaluation Criteria

Criteria #	Criteria Description	Criteria Weight
1	Traffic Levels of Service - Capacity	5
2	System Performance	5
3	Safety	5
4	Emergency Response Time	5
5	Cost	5
6	Environmental Impacts	4
7	Right-of-Way Impacts	3
8	Consistency with Local / Land Use Plans	2

Alternative 1

Criteria #	Criteria Description	Score
1	Traffic Levels of Service - Capacity	1
2	System Performance	2
3	Safety	2
4	Emergency Response Time	2
5	Cost	3
6	Environmental Impacts	2
7	Right-of-Way Impacts	2
8	Consistency with Local / Land Use Plans	2
	Total	**16**

Alternative 2

Criteria #	Criteria Description	Score
1	Traffic Levels of Service - Capacity	2
2	System Performance	2
3	Safety	2
4	Emergency Response Time	2
5	Cost	3
6	Environmental Impacts	3
7	Right-of-Way Impacts	2
8	Consistency with Local / Land Use Plans	2
	Total	**18**

Alternative 3

Criteria #	Criteria Description	Score
1	Traffic Levels of Service - Capacity	4
2	System Performance	4
3	Safety	4
4	Emergency Response Time	4
5	Cost	2
6	Environmental Impacts	3
7	Right-of-Way Impacts	2
8	Consistency with Local / Land Use Plans	2
	Total	**25**